pitt&sherry

Tamworth Organics Recycling Facility

Environmental Impact Statement

Prepared for
Tamworth Regional Council

Client representative
Megan Mather

Date
23 September 2019

Rev02

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Reviewed by — Jessica Berry		**Date — 23/09/2019**
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Term and references

Term/ acronym	Description
AHIMS	Aboriginal Heritage Information Management System
CEMP	Construction Environmental Management Plan
DECC	The NSW Department of Environment and Climate Change
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental impact statement
EP&A Act	The NSW Environmental Planning and Assessment Act 1979. Provides the legislative framework for land use planning and development assessment in NSW.
EP&A Regulation	The NSW Environmental Planning and Assessment Regulation 2000
EPBC Act	The Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
EPL	Environment Protection Licence
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased.
FO	Food Organics
FOGO	Food Organics / Garden Organics
FRWMF	Forest Road Waste Management Facility
GO	Garden Organics
LEP	Local Environmental Plan
LGA	Local Government Area
MAF	Mobile Aerated Floor
MNES	Matters of National Environmental Significance
NML	Noise management level
NPW Act	National Parks and Wildlife Act 1974
OEH	New South Wales Office if Environment and Heritage
OER	Odour emissions rates
ORF	Organics Recycling Facility
PEA	Preliminary Environmental Assessment
PHA	Preliminary Hazard Assessment
PM10	particulate matter 10 micrometers or less in diameter
PM2.5	particulate matter 2.5 micrometers or less in diameter
REF	Review of Environmental Factors
REP	Regional Environmental Plan
Resurfacing	Removal and replacement of the existing pavement surface
RMS	The NSW Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements

Term/ acronym	Description
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SSD	State Significant Development
STP	Sewage Treatment Plant
TEC	Threatened Ecological Community
TRC	Tamworth Regional Council
TCS	Tunnel Composting System
TSP	Total suspended particulate

Executive Summary

This Environmental Impact Statement (EIS) has been prepared by pitt&sherry on behalf of Tamworth Regional Council (TRC) to support a Development Application (DA) for a resource recovery facility (composting). This EIS has been prepared pursuant to the Secretary's Environmental Assessment Requirements (SEARs) for the Proposal issued by the Department of Planning, Industry and Environment (DPIE) on 30 May 2019.

TRC propose to construct and operate an Organic Recycling Facility (ORF) at 284 Gidley Appleby Road located approximately 15km north west of Tamworth City (the "Proposal"). The proposed facility will accept and process up to 35,000 tonnes per annum of Food Organics (FO), Garden Organics (GO) and Category 3 organic materials. The proposed facility will utilise proven Tunnel Composting System (TCS) technology within an enclosed facility to process these materials to produce various soil amendments suitable for use in landscaping and agricultural production. The Proposal would commence operation in parallel with the introduction of a FOGO kerbside collection service within the Tamworth Local Government Area (LGA).

The proposed facility will comprise approximately 11ha of land on Lot 61, DP 707563 (the "Site"). The Site has a total land area of 117ha, is a rural property owned by TRC and zoned RU1 Primary Production. Ancillary works including bore works and access road construction be completed as part of the development.

The Site and surrounding land is cleared agricultural land, which has historically and is currently used for cropping and improved pastures. It consists of flat to very gentle undulating topography approximately 700m to the west of Peels Creek.

The Site, ancillary works area and its surrounds have been significantly disturbed by construction of roads, farming activities, and commercial developments such as the nearby Tamworth Regional Airport. Vegetation on the Site is restricted to grasses, weeds and several trees. The ancillary works area includes a number of trees however, only 1 hollow bearing tree will require removal.

TRC operates a Composting Facility located on-site at the Forest Road Waste Management Facility (FRWMF), which under the Environment Protection Licence (EPL), issued by the NSW Environment Protection Authority (EPA) is restricted to the processing of green waste. The Compost Facility has reached full capacity and there is no alternative solution within the Tamworth LGA to divert and process the remaining organic material streams (FO and Category 3 organics) from being landfilled.

As such, development of a new dedicated ORF will increase the quantity of organic material able to be diverted from landfill in Tamworth and the surrounding region. This would increase the life of the FRWMF, further improve local recycling rates and the sustainability of the Tamworth Region. It will also provide a more environmentally sustainable alternative to mined top-soil and chemical fertilisers for local and regional businesses and the agricultural industry.

A comprehensive site selection process was undertaken to determine a suitable Site to develop a dedicated ORF for the Tamworth Region.

This EIS describes the environmental impacts related to the Proposal and provides a comprehensive assessment of those impacts. The potential environmental impacts have been identified through assessment of the Proposal scope, review of the SEARs and consultation with relevant stakeholders and the community and the following key environmental impacts have been identified:

- Air quality and odour;
- Leachate and Wastewater Management;
- Surface Water Hydrology and Storm Water Management;
- Hazards including biosecurity, bird strike and operational fire; and
- Traffic and transport.

The Proposal will be located a reasonable distance from large population centres and individual rural residences. The Proposal area is situated with buffer distances exceeding 800m to neighbouring residences, which will significantly reduce the risk of impacts upon surrounding residents from operation of the facility.

An Air Quality Impact Assessment was undertaken. CALPUFF Modelling System and The Air Pollution Model was used. This is based on Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC, 2005). The odour impact assessment found impacts from the Proposal would be low and would not lead to a level of odour, which is likely to be noticed in the surrounding environment.

A water balance prepared for the Site identified areas of wastewater collection, storage and reuse in the proposed facility and identifies an appropriate size of the proposed wastewater management systems. The proposed leachate dam has capacity to provide temporary storage of leachate for reuse within operations. By careful design and implementation of a discrete leachate drainage and reuse system separate from stormwater, potential impacts from leachate and other wastewater are considered to be minimal. Lining of the leachate dam and drainage system is in accordance with EPA Guidelines and would protect soils and groundwater.

This Proposal involves the transportation of organic material for processing to produce a compost product for commercial sale, which has the potential to present biosecurity risks. The Proposal has been designed to fully enclose the compostable materials dropped off on-site in sealed trucks and provide a suitable, controlled area for unloading of incoming organic materials. The material received will be processed for approximately 10-12 weeks including 28 days' pasteurisation within the TCS, which is twice the duration recommended by the indicative TCS supplier (AP 2018). The organic material will be pasteurised at around 55-65 ºC to destroy pathogens and denature weed seeds. The extensive tunnel composting process and enclosed Receival Shed minimise the likelihood of attracting birds further reducing potential risks associated with Proposal.

A Traffic Impact Assessment was undertaken for the Proposal. The proposed haulage routes are approved B-double routes and the increased traffic can access the Site safely in accordance with AUSTROADS Guidelines. The increase in vehicle movements would be distributed across three primary haulage routes thus minimising the impact on any one receiver.

A comprehensive assessment of all environmental impacts is provided in Chapter 6 of this EIS and appropriate mitigation and management measures outlined in Chapter, which will be carried out during the construction, operation and decommissioning phases.

The Proposal will provide socioeconomic benefits by converting organic material generated by residents and commercial businesses into beneficial compost products. This will add value to the local agricultural industry by reducing the need for artificial soil conditioners. The Proposal will involve capital investment in excess of $10 million within the region during construction and full-time employment of six persons during operation.

1. Introduction

This Environmental Impact Statement (EIS) has been prepared by pitt&sherry on behalf of Tamworth Regional Council (TRC) to support a Development Application (DA) for a 35,000 tonne per annum (tpa) resource recovery facility (composting) at 284 Gidley Appleby Road, Gidley.

The proposed development is a key component of TRC waste management strategy to expand its domestic garden organic collection services to include food organic materials and increase TRC's capacity to process domestic and commercial garden and food organic materials for commercial reuse for compost and mulching products.

As the capital investment value of the development is more than $5 million, the consent authority for the DA is the Northern Joint Regional Planning Panel.

In this EIS, a resource recovery facility (composting) is referred to as an Organic Recycling Facility (ORF).

1.1 Proposal Overview

TRC proposes to construct and operate an ORF at 284 Gidley Appleby Road located approximately 15km north west of Tamworth City (the "Proposal") (Figure 1-1). The proposed facility will accept food organics (FO), garden organics (GO) and Category 3 organic materials which will be processed to produce various soil amendments suitable for use in landscaping and agricultural production.

Currently, TRC are only able to process and compost a maximum of 15,000 tpa of GO only at the existing Forest Road Waste Management Facility (FRWMF). This facility produces a high-grade mulch product. FRWMF has reached capacity of its current operational footprint and is not able to support further organics processing.

The proposed facility will utilise proven Tunnel Composting System (TCS) technology within an enclosed facility to process FOGO and category 3 organic materials. Category 3 organic materials include meat, fish and fatty foods, fatty and oily sludges and organics of animal and vegetable origin.

The Proposal would have the capacity to process 35,000 tpa of organic materials and would commence operation in parallel with the renewal of the TRC's Waste Collection Contract, including introduction of a FOGO kerbside collection service.

These organic materials are currently being landfilled at the FRWMF and so this Proposal would enable diversion of significant volumes of organic material from landfill to produce a beneficial commercial product.

Source separated organic material will be derived from domestic kerbside collection, commercial waste collections and commercial businesses as outlined in Table 1-1.

Table 1-1 Inputs to the ORF (Source: Tamworth Regional Council)

Input	Source
Food Organics and Garden Organics (FOGO) - Domestic	Tamworth LGA Kerbside Collection
Garden Organics	FRWMF Transfer Station (Domestic drop off) Commercial businesses (Drop off to ORF)
Wood product (Uncontaminated)	Commercial businesses (Drop off to ORF)
Offal and Paunch (including Abattoir DAF sludge)	Commercial businesses (Drop off to ORF)
Liquid Waste	Commercial waste collection (Drop off to ORF)

The proposed facility fits the description of "composting facilities or works that process more than 5,000 tonnes per year of organic materials" and therefore meets the definition of a Designated Development as described in Clause 13 of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The proposed facility is also Integrated Development due to the Environmental Protection Licence (EPL) that is required under the *Protection of Environment Operations Act 1997*.

The EIS has been prepared in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to support a DA for the Proposal. This EIS has been prepared pursuant to the Secretary's Environmental Assessment Requirements (SEARs) for the Proposal issued by the Department of Planning, Industry and Environment (DPIE) on 30 May 2019. A copy of the SEARs is included in **Appendix A** and a summary of where these have been addressed in the EIS is included in **Appendix B**.

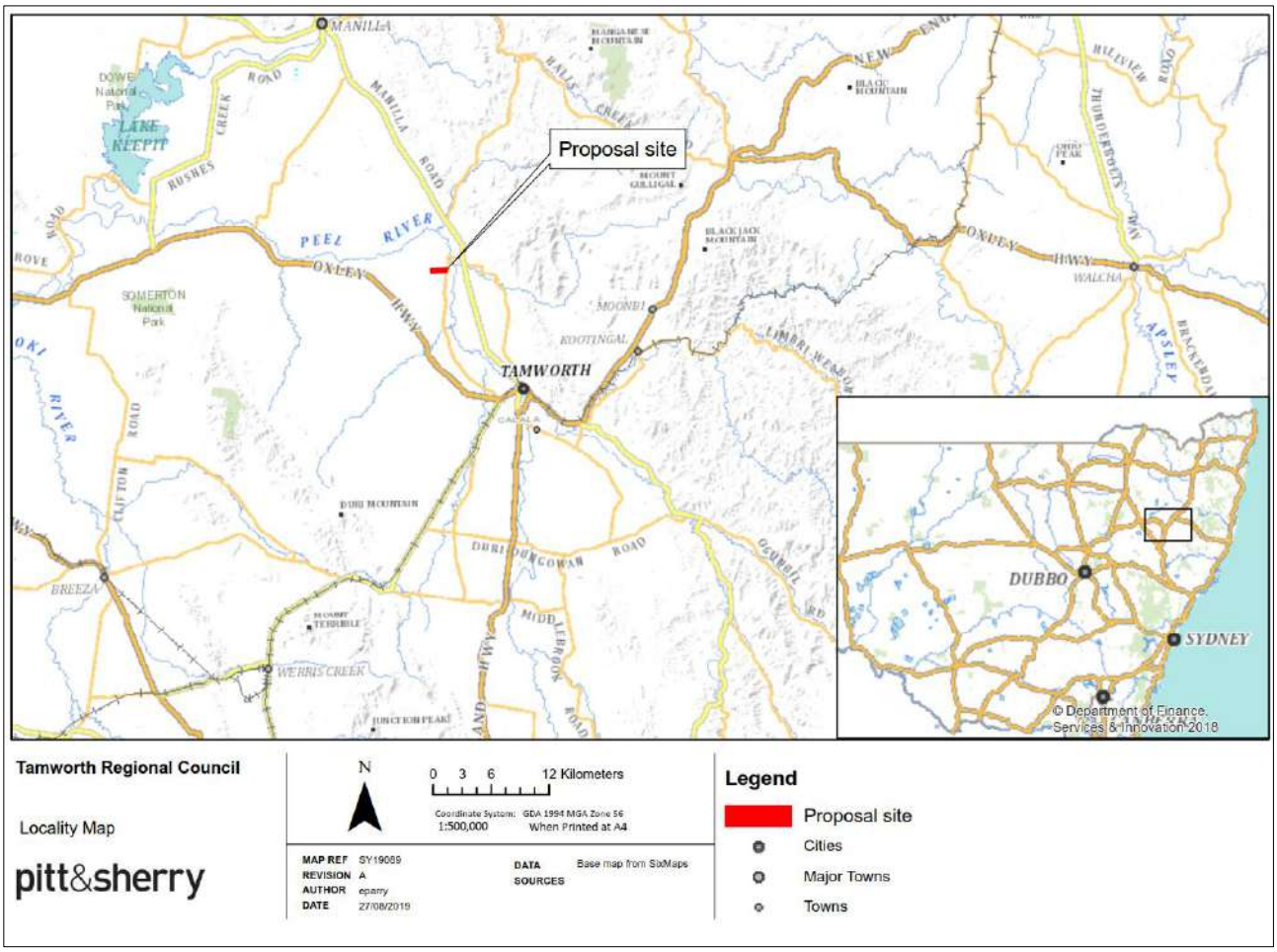

Figure 1-1 Locality Map / Site Context (Source: Tamworth Regional Council 2010)

1.2 The Proponent

The proponent for the Proposal is TRC as the owner of the property and future licence holder for the proposed facility.

TRC is the one of the largest Councils in inland NSW, governing an area of 9,653km^2 and a population of 62,156 (ABS 2018), three quarters of which reside within the city of Tamworth. TRC currently operate the FRWMF in Tamworth and this proposal forms part of the strategic waste management plan for the LGA.

Following construction of the Proposal a contractor will be selected to operate the ORF on behalf of TRC.

1.3 Proposal Area

The Proposal is to be located at 284 Gidley Appleby Road, Tamworth (the “Property”). The ORF and its development footprint is estimated to be approximately 11 ha (the “Site’) within the 117ha property (Figure 1-2). The Site is located to the north east of the Tamworth Regional Airport, north west of the existing FRWMF and approximately 15 km north west of Tamworth City Centre.

The remaining land on the property will be maintained and managed by TRC with any additions or changes to future use subject to modifications or separate DAs including additional environmental assessments as deemed relevant.

For the purpose of this EIS the proposal area includes the full construction and operational footprint that may be impacted by development and operation of the Proposal including:

- The buildings, maturation pad and operational areas that make up the ORF comprise of approximately 6ha within the centre of Lot 61 DP 707563, located on Gidley Appleby Road, Tamworth (Figure 1-2);
- Ancillary works including bore works and access road construction (approx. 5ha) which are in addition to the 6ha outlined above; and
- Minor works within the road corridor along the haulage route including upgrades to signage (further described in Section 6.3).

Further information regarding the options and alternatives considered including site selection is outlined in Section 1.9 and a description of the existing environment at the Site is outlined in Section 2.

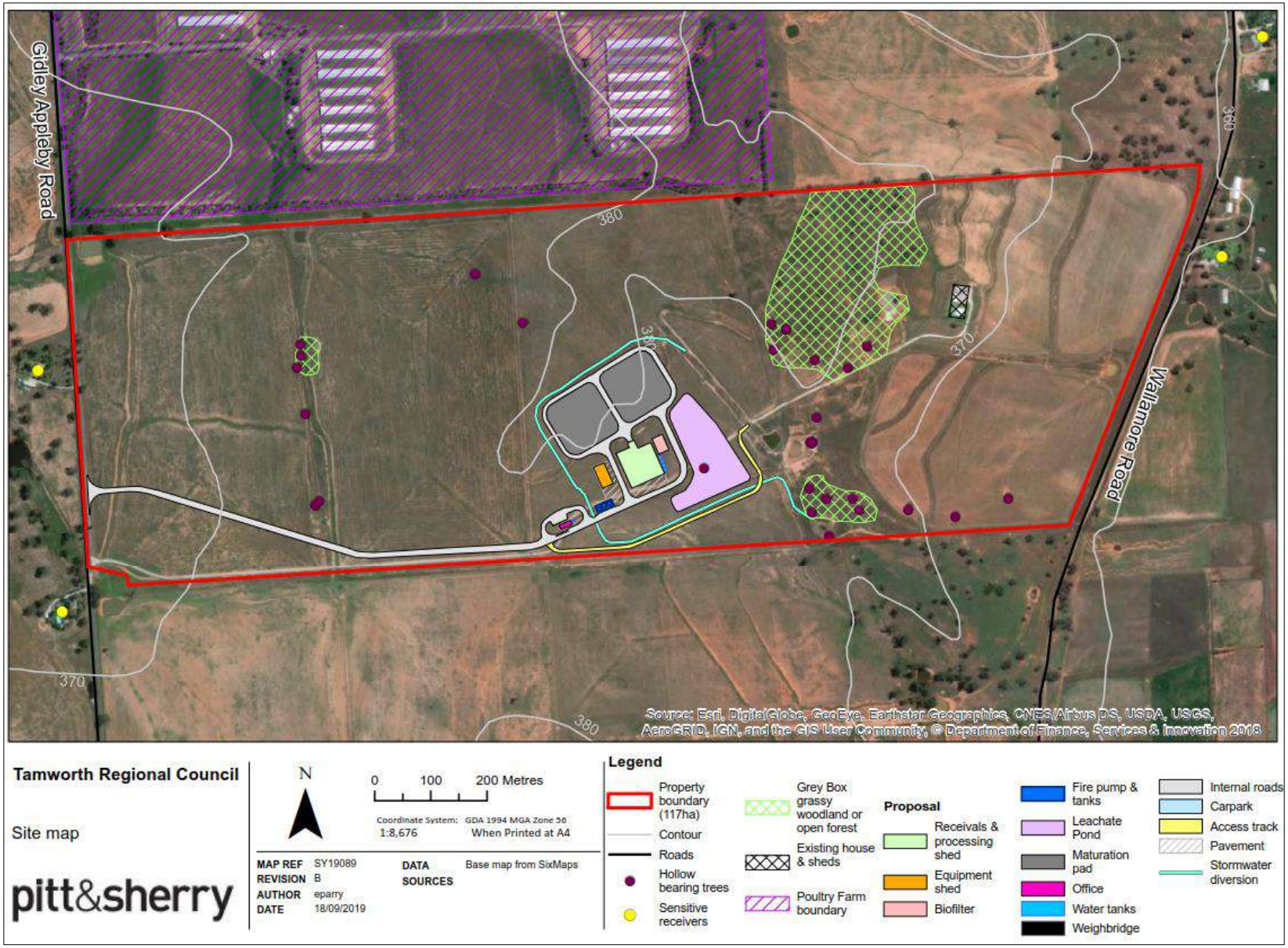

Figure 1-2 ORF Site map

1.4 Approval Pathway

The Proposal is defined as a "composting facilities or works that process more than 5,000 tonnes per year of organic materials" and therefore meets the definition of a Designated Development as described in Clause 13 of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*. The Proposal is also deemed an integrated development as an EPL is required to construct and operate the proposed composting facility under the *Protection of Environment Operations Act 1997.* Therefore, approval for the proposal is sought under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Council is both the land owner and applicant for the DA that has a Capital Investment Value more than $5m. Accordingly, under Schedule 7 of State Environmental Planning Policy State and Regional Development, Council related development over $5m is 'regionally significant development". Under *Section 4.5 Designation of consent authority* under the EP&A Act, the consent authority for regionally significant development is the regional planning panel – in this instance the Northern Regional Planning Panel.

1.5 Purpose of this Document

This EIS has been prepared to accompany the DA for the Proposal under Part 4 of the EP&A Act.

This EIS has been prepared pursuant to the SEARs for the Proposal issued by the Department of Planning, Industry DPIE on 30 May 2019. A copy of the SEARs is included in **Appendix A**. **Appendix B** provides a summary of the SEARs and identifies where they have been addressed in this EIS.

The purpose of this EIS report is to:

- Provide a comprehensive description of the Proposal and the lands affected;
- Assess the potential environmental impacts of the Proposal on the physical, social and economic environment (having regard to both current and future land use);
- Identify management and mitigation measures to be implemented to minimise potential impacts associated with the Proposal; and
- Justify the Proposal, including suitability of the Site and its alignment with whether the Proposal is in keeping with public interest.

The key recommendations and management measures described in the report have been included in Chapter 7. They would form a key component of any conditions of approval issued for the Proposal.

1.6 Structure of EIS

The structure of the EIS is outline din the table below.

Table 1-2 Structure of the EIS

Chapter		Content
Chapter 1	Introduction	Project background, information about the proponent, location, planning history and environmental assessment requirements.
Chapter 2	Site Description	Description of the Proposal Site and surrounding area

Chapter		Content
Chapter 3	Proposal Description	Detailed description of the Proposal including the need for the Proposal and alternatives considered
Chapter 4	Statutory Planning Framework	Consideration of the relevant statutory provisions and planning pathway
Chapter 5	Consultation and Issues identified	Summary of consultation undertaken with Government agencies, stakeholders and the community
Chapter 6.1	Air Quality and Odour	Detailed assessment of the potential impacts of the Proposal for a range of key environmental aspects
Chapter 6.2	Noise and Vibration	
Chapter 6.3	Traffic and Transport	
Chapter 6.4	Biodiversity	
Chapter 6.5	Aboriginal Cultural Heritage	
Chapter 6.6	Non-Aboriginal Heritage	
Chapter 6.7	Soils and Geology	
Chapter 6.8	Surface Water, Hydrology and Stormwater Management	
Chapter 6.9	Groundwater	
Chapter 6.10	Wastewater Management	
Chapter 6.11	Waste Management	
Chapter 6.12	Visual amenity	
Chapter 6.13	Bushfire	
Chapter 6.14	Hazard and Risk	
Chapter 6.15	Socio-economic considerations	
Chapter 6.16	Cumulative impacts	
Chapter 7	Management and Mitigation Measures	Consolidated summary of recommended management and mitigation measures
Chapter 8	Justification and Conclusions	Conclusion to the EIS including key findings
Chapter 9	References	
Appendix A	Secretary's Environmental Assessment Requirements	Supporting documentation including the technical specialist reports
Appendix B	Table summarising where SEARs are addressed in the EIS	
Appendix C	Consultation Materials	

Chapter		Content
Appendix D	Preliminary Engineering Design	
Appendix E	Air Quality Impact Assessment	
Appendix F	Noise and Vibration Impact Assessment	
Appendix G	Traffic and Transport Impact Assessment	
Appendix H	Flora and Fauna Impact Assessment	
Appendix I	Aboriginal Cultural Heritage Impact Assessment	
Appendix J	Geotechnical Investigation Report	
Appendix K	Bushfire Assessment	
Appendix L	Hazard and Risk Assessment	
Appendix M	Desktop Wildlife Hazard Assessment	
Appendix N	Water Balance	

1.7 Project Team

pitt&sherry has prepared this EIS on behalf of TRC.

Specialist studies were completed during the assessment process as outlined in Table 1-3. The various technical reports produced by these specialists are provided in the Appendices to this EIS.

Table 1-3 Project Team

Role	Organisation Responsible	Appendix Reference
Preliminary Engineering Design	pitt&sherry	Appendix D
Air Quality Impact Assessment	Todoroski Air Sciences	Appendix E
Noise and Vibration Impact Assessment	Muller Acoustic Consulting	Appendix F
Traffic and Transport Impact Assessment	pitt&sherry	Appendix G
Flora and Fauna Impact Assessment	Ecological	Appendix H
Aboriginal Heritage Impact Assessment	Ecological	Appendix I
Geotechnical Assessment	Regional Geotechnical Solutions	Appendix J
Bushfire Risk Assessment	Ecological	Appendix K

Role	Organisation Responsible	Appendix Reference
Hazard and Risk Assessment	pitt&sherry	Appendix L
Desktop Wildlife Hazard Assessment	Avisure	Appendix M
Water Balance	pitt&sherry	Appendix N

1.8 Proposal Justification

In order for TRC to improve on the region's waste and resource recovery initiatives and diversion targets, the development of a dedicated ORF is deemed necessary. A dedicated facility is required due to the current constraints.

TRC are proposing the development of a dedicated ORF primarily due to the shortage of available capacity and suitable location of the Composting Facility at the existing FRWMF. The Composting Facility at the FRWMF is not licenced to receive additional streams for composting such as FO or Category 3 organic materials.

In June 2017, TRC adopted the Integrated Waste Management and Resource Recovery Strategy (the Strategy), which identifies TRC's ambitions for sustainable waste management incorporating increased resource recovery and recycling.

TRC's Strategy aligns with both:

- State Government - Environment Protection Authority's (EPA) Waste Avoidance and Resource Recovery Strategy (WARR Strategy); and
- Regional waste policies and strategic themes - Northern Inland Regional Waste Group (NIRW Waste Strategy).

TRC want to reduce or divert the amount of organic materials currently being landfilled and recycle them into a valuable product, which has a beneficial reuse value. The establishment of a dedicated ORF aligns with TRC's Strategy and the EPA's WARR Targets, which currently TRC cannot meet because TRC does not have the established additional infrastructure required to process these materials.

This is demonstrated in Figure 1-3 which identifies existing and predicted future recycling targets (2017/2018 FY).

Waste Type	Tonnes Received	Tonnes Recycled	Council's Current Recycling Rate	WARR Strategy Targets	Predicted Figures after implementation of the ORF.
Municipal Solid Waste	37,204	15,712	42%	**70%**	**55%**
Commercial and Industrial Waste	30,617	5,931	19%	**70%**	**41%**
Construction and Demolition Waste	10,659	9,749	91%	**80%**	**91%**

Figure 1-3 Existing and Future Recycling Targets

TRC anticipates that within the first year of the Facility's operation up to 15,000 tonnes of organic material will be diverted from being landfilled at the FRWMF. Even if there is no increase in tonnages diverted the following years, this would still equate to roughly an additional 5 years of landfill life at the FRWMF over 25 years.

Forest Road Waste Management Facility (FRWMF)

Current handling of organic materials by TRC for the Tamworth LGA is restricted to two processes – Composting and Landfilling. TRC operates a Composting Facility at FRWMF that accepts and processes green waste, which is approximately one third (1/3) of organic material received at FRWMF. The remaining two thirds (2/3) of organic streams comprise of FO and Category 3 organics, which are currently landfilled.

The primary reason for landfilling of the remaining two thirds (2/3) of organic material that arrives at the FRWMF is that under the EPL, approved by the NSW EPA, the Composting Facility is limited to processing of green waste only and cannot include the additional organic streams into the compost process. As such, there is no current alternative solution to divert and process the remaining organic materials within the Tamworth LGA.

TRC has an opportunity to divert these organic streams from landfill by developing a designated ORF. The benefits of this include reducing up to 15,000 tpa of organic material that is currently being landfilled.

This results in saving valuable landfill space utilised by organic materials that could be repurposed into a quality soil material and ultimately extends the lifetime of the FRWMF.

1.9 Options and Alternatives Considered

The current composting facility located at the FRWMF has reached full capacity, is not licensed to receive FO, and has a lack of suitable land available for expansion. Residential land is encroaching on the east, north and west of the facility.

There is no alternative ORF available in the region with the capability to process FOGO and the closest ORF is in Armidale. The Armidale ORF processes less than 10,000 tpa of FO and is approximately 120 kilometres away from the Site via the existing road network.

A number of alternatives were assessed during the development of the proposal. These included:

- Option 1 - Upgrading the existing ORF facility at the FRWMF.
- Option 2 - Transport of organics materials to the Armidale ORF.
- Option 3 - The “do nothing” option;
- Option 4 – Construct a new ORF

TRC reviewed these options and this assessment process determined that building a new facility was the preferred option. The options are discussed briefly below.

1.9.1 Option 1- Upgrading Forest Road Waste Management Facility

- There is no suitable space available on-site at FRWMF for the establishment of an ORF;
- FRWMF is located in very close proximity to high density residential developments, with insufficient space to establish the required buffer zones to mitigate any potential environmental impacts (i.e. odour, noise, traffic etc.); and
- FRWMF already receives a high level of traffic flow on a day to day basis with a mix of domestic and commercial customers. Establishing a commercial facility on the same land parcel, would increase the risks associated with traffic movements on-site.

1.9.2 Option 2 - Transport to another ORF

FO and GO could be transported to another ORF. The closest ORF for the Tamworth LGA is in Armidale. Transporting to this ORF is not considered feasible as the site:

- Has a licence limit and processes less than 10,000 tpa of FO; and
- Is approximately 120km from Tamworth making transport potentially cost prohibitive.

1.9.3 Option 3 - “Do nothing”

The “do nothing” option has been discounted as it would result in the continued disposal of FO and category 3 organic to the FRWMF. This would reduce the life of the landfill and does not align with both the State and Local Government waste and resource recovery reduction initiatives

1.9.4 Option 4 - Construct a new ORF

A new facility will provide the opportunity for additional organic materials to be diverted from landfill in Tamworth and the surrounding region. This would increase the life of the landfill at FRWMF, improve local recycling rates and contribute towards the sustainability of the Tamworth Region. It will also provide a more environmentally sustainable alternative to mined top-soil and chemical fertilisers for local and regional businesses and the agricultural industry across NSW.

1.10 Site Selection

TRC undertook a detailed Site selection feasibility assessment, which included identifying key constraints and opportunities and undertaking a GIS analysis. The GIS analysis identified a number of potential sites that met the below criteria.

Several sites were identified at this stage and further assessment was undertaken to identify a shortlist of preferred sites for TRC to investigate further including potential for acquisition.

Principles of the detailed site selection process included:

- Distance from Tamworth CBD, FRWMF and Tamworth Regional Airport;
- Land use permissibility;
- Presence of environmentally sensitive areas;
- Site Access via Road Network;
- Property Size >100ha;
- Compatibility with surrounding land use; and
- Site inspection.

The outcomes from the detailed site selection process indicate the identified Site, located at 284 Gidley Appleby Road is suitable for the Proposal.

1.11 Technology Selection

TRC considered multiple technologies for the proposed ORF. Overall performance and suitability of the technologies were considered as well as capital costs and odour control. Table 1-4 below provides a summary of the technologies considered.

Table 1-4 Composting technologies considered

Type	Description	Odour Control	Capital Cost

Open Windrow Composting	Premixed composting materials are formed into elongated piles. Turning of piles acts to aerate the materials and breakdown. Offers limited process control.	Nil	Low
Covered Aerated Static Pile (CASP) Composting	Premixed composting materials are formed into elongated piles similar to open windrow composting. An air distribution system is located under the pile, which forces air through the pile. Covering the pile minimises odorous air being emitted.	Piles are covered with composted material to metabolise the odour or possible to utilise synthetic covers	Medium
In-Vessel Composting	Premixed composting materials are loaded into a container / vessel and sealed. Air is forced through the container with air collected in the headspace being partially vented through a biofilter. Fresh air needs to be introduced into the cycle when required and oxygen depleted hot air released through a biofilter.	Possible to capture odorous air for treatment with biofilter or other odour scrubber	High
Fully Enclosed Composting	Involves using in-vessel composting in a fully enclosed building operated under negative air pressure. Extracted air is typically treated through a biofilter or other type of odour scrubber prior to discharge to the atmosphere.	Biofilter or other odour scrubber prior to discharge to atmosphere	High
Anaerobic Digester (AD) plant	Premixed composting materials are loaded into a sealed vessel / tank. Biological breakdown of organic materials occurs using specialist bacteria that thrive in the absence of oxygen. Not suited to all streams and extracted air requires treatment through a biofilter or other type of odour scrubber prior to discharge to the atmosphere.	Biofilter, odour scrubber or carbon filters prior to discharge to the atmosphere.	Very High

A fully enclosed composting system was selected for being a proven technology to control odours and provide high quality end products.

2. Site Description

2.1 Overview

The Site for the Proposal is located at 284 Gidley Appleby Road (Lot 61 DP 707563) north west of Tamworth (Figure 1-1). The Proposal will occupy approximately 11ha of land on Lot 61 DP 707563.

Ancillary works associated with the proposed facility including road works, utility supply and upgrades to the existing bore. Additionally, minor signage upgrades along the haulage route will also be undertaken.

2.2 Land Ownership

The land located on Lot 61 DP 707563 is owned by TRC. The Site is located on land zoned RU1 Primary Production (Tamworth Local Environment Plan 2010). The land zoning suitability for this Proposal is discussed in Section 4.4.1.

2.3 Current and Historic Land Use

The Site and surrounding land were historically a hobby farm and has been largely cleared for agricultural use. The Proposal will only occupy a portion (approximately 11ha) of the Site and the non-utilised land will be left in the present condition and maintained by TRC.

2.4 Regional Context and Surrounding Land Use

2.4.1 Surrounding Land Use

The surrounding land use for the Proposal consists mostly of agricultural and rural residential. Immediately north of the Site is a poultry farm which is owned by 'ProTen Tamworth Limited'.

The Site is also bounded by Gidley Appleby Road to the west and Wallamore Road (no public access) to the east. The Peel River is located approximately 0.7 km to the east of the Site.

Any changes to surrounding land uses that would result in an increase in the residential density surrounding the ORF would be subject to the DA made for that subdivision.

2.4.2 Surrounding Residences and Sensitive Receivers

The Site is located within a generally flat topography and surrounding residences are scattered within the rural environment.

The majority of the residential receivers are located to the west and east of the Site. The nearest residential receiver is located approximately 180m from the access gate on Gidley Appleby Road and approximately 800m west of the ORF structures.

There are 11 sensitive receivers are located within 1km of the Site and approximately 50 sensitive receivers within 2km of the Proposal as identified in Figure 2-1.

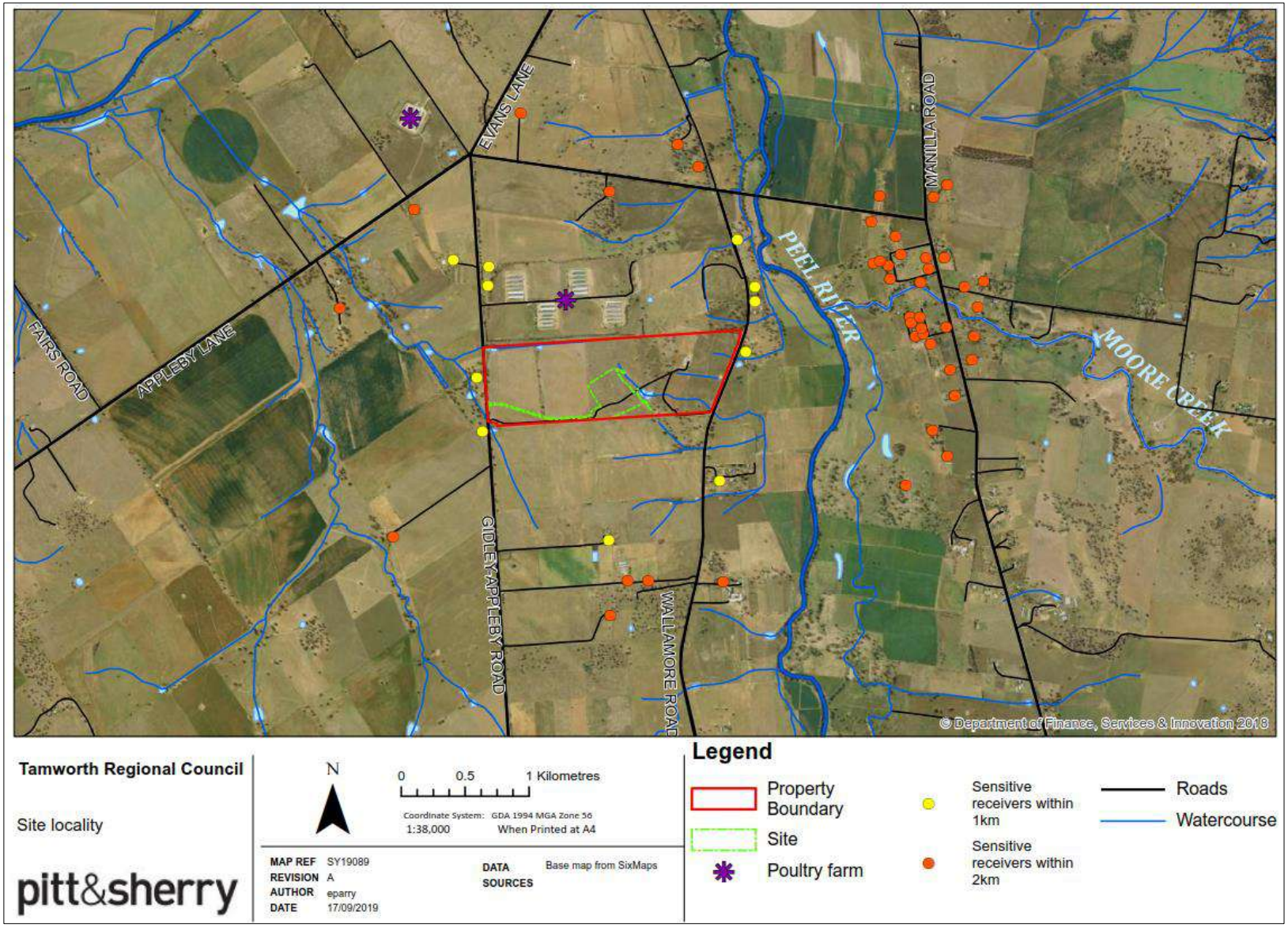

Figure 2-1 Existing Environment and receivers within 2km (source: pitt&sherry)

2.4.3 Topography

The Site and surrounding area consist of generally flat topography. The Site is located within an open plain/creek flat landform approximately 700m to the west of Peel River.

2.4.4 Catchment and Drainage

The Site drains through first order streams and flows onto a tributary of the Peel River within the Namoi catchment.

The Namoi catchment is a major sub-catchment of the Murray-Darling Basin. Tamworth is the largest urban centre in the catchment. The catchment is approximately 42,000 square kilometres and stretches from the Great Dividing Range near Tamworth, to the Barwon River near Walgett. The Namoi River forms a complex pattern of creeks and streams before joining the Barwon River at Walgett. Its main tributaries are the Manilla and Peel Rivers. The Peel River has a catchment area of around 4,700 square kilometres and contributes an average annual volume of approximately 280,000 megalitres to the Namoi River (WaterNSW, 2016).

2.4.5 Meteorology

Two Bureau of Meteorology weather stations are located in proximity to the Site.

The closest weather station with the most complete rainfall data is the Somerton (Bective Estate) Station (Station No. 055003) with recorded rainfall data for the period 1882-2019, with 17 years of missing data.

Based on the historical rainfall records of Bective Estate Station, the minimum, mean and maximum annual precipitations at the site are 284mm, 611mm and 1,121mm, respectively. On average and based on the historical records, January is the wettest and April is the driest month.

Figure 2-2 presents mean monthly rainfall depths based on Somerton historical data. The monthly evaporation data are also shown based on the SILO database Data Drill (Queensland Government).

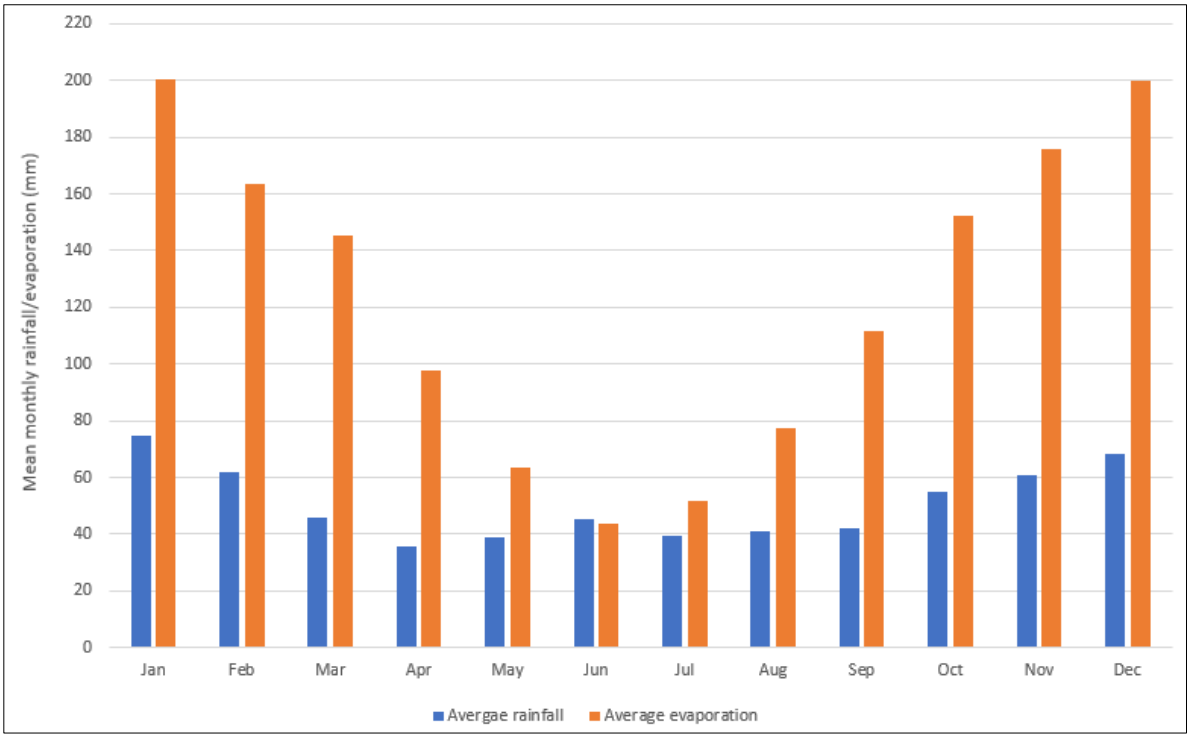

Figure 2-2 Site mean monthly rainfall at Somerston Station (1882-2018, BoM) and evaporation (1889-2018, SILO Data Drill)

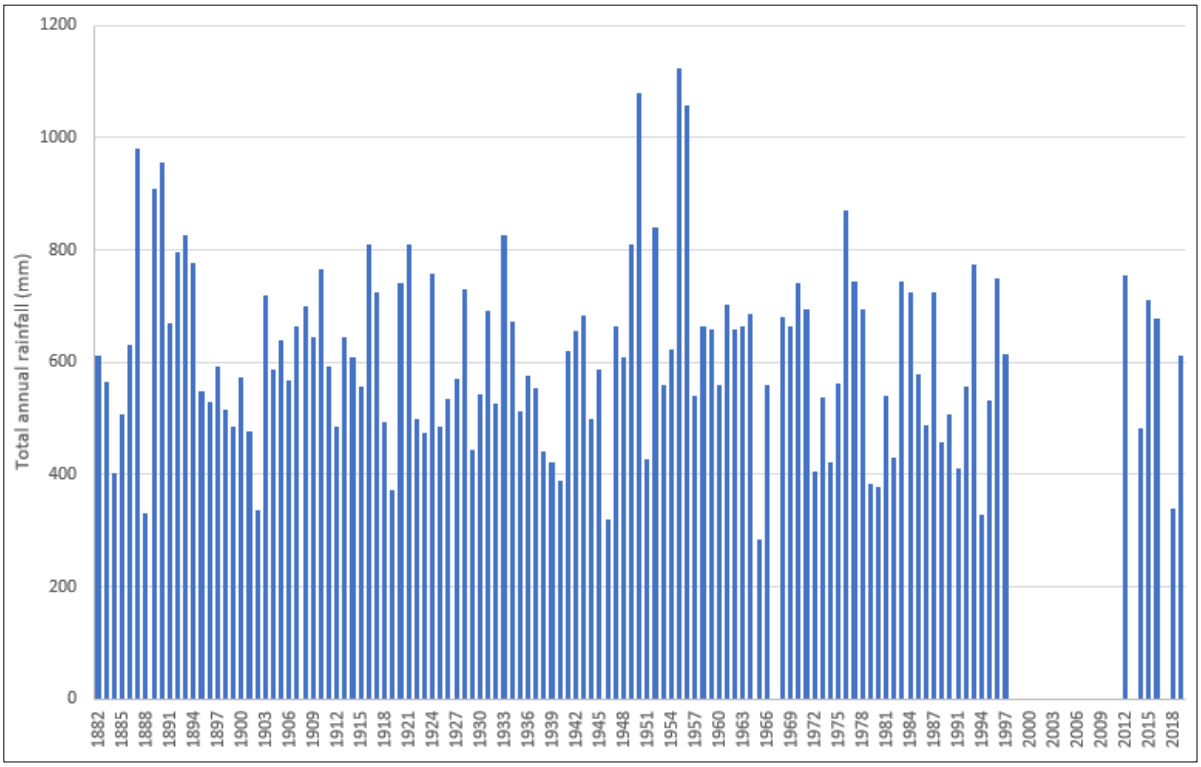

Figure 2-3 Historical annual rainfall depths at Somerston Station (1882-2018).

Long-term climatic data from the weather station at Tamworth Airport (Site No. 055325) has also been used to characterise the local climate in the proximity of the Proposal. The Tamworth Airport AWS is located approximately 10km south of the Proposal (see Table 2-1).

Table 2-1 and Figure 2-4 present a summary of data from the Tamworth Airport collected over an approximate 17 to 27-year period for the various parameters.

The data indicates that January is the hottest month with a mean maximum temperature of 32.8 degrees Celsius (ºC) and July is the coldest month with a mean minimum temperature of 2.2ºC.

Rainfall is variable and peaks during the summer months. The data indicates that November is the wettest month with an average rainfall of 83.1 millimetres (mm) over 7.1 days and April is the driest month with an average rainfall of 25.2mm over 2.8 days.

Humidity levels exhibit some variability and seasonal flux across the year. Average 9am humidity levels range from 56 per cent (%) in January and October to 83% in June. Mean 3pm humidity levels vary from 35% in January to 52% in June.

Wind speeds have a similar spread between the 9am and 3pm conditions throughout the year. Mean 9am wind speeds range from 9.1 kilometres per hour (km/h) in June to 13.1km/h in November and mean 3pm wind speeds range from 14.2km/h in June to 17.9km/h in November.

Table 2-1 Monthly Climate statistics summary – Tamworth Airport AWS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (ºC)	32.8	31.6	29.3	25.5	20.8	17.0	16.4	18.4	21.9	25.5	28.5	30.5	24.9
Mean min. temp. (ºC)	17.5	16.9	14.4	10.1	6.0	3.7	2.2	2.7	5.8	9.6	13.3	15.6	9.8
Rainfall													

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Rainfall (mm)	61.4	70.5	48.9	25.2	29.1	54.1	41.1	39.4	45.3	55.6	83.1	78.2	631.9
No. of rain days (≥1mm)	5.1	5.7	4.7	2.8	3.3	5.4	4.9	4.1	4.8	5.5	7.1	6.7	60.1
9am conditions													
Mean temp. (°C)	24.0	22.7	20.7	18.1	13.3	9.4	8.3	10.5	14.7	18.8	20.4	22.6	17.0
Mean R.H. (%)	56	63	64	60	72	83	81	71	63	56	58	57	65
Mean W.S. (km/h)	12.9	12.2	11.6	9.9	9.5	9.1	9.3	10.2	11.5	12.8	13.1	12.5	11.2
3pm conditions													
Mean temp. (°C)	30.8	29.5	28.0	24.3	19.8	16.0	15.2	17.5	20.6	23.8	26.3	28.7	23.4
Mean R.H. (%)	35	40	37	36	44	52	51	41	40	38	39	36	41
Mean W.S. (km/h)	16.8	16.3	15.8	15.1	14.3	14.2	14.8	16.9	17.3	17.5	17.9	16.7	16.1

Source: **Bureau of Meteorology, 2019 (accessed 8 January 2019)**

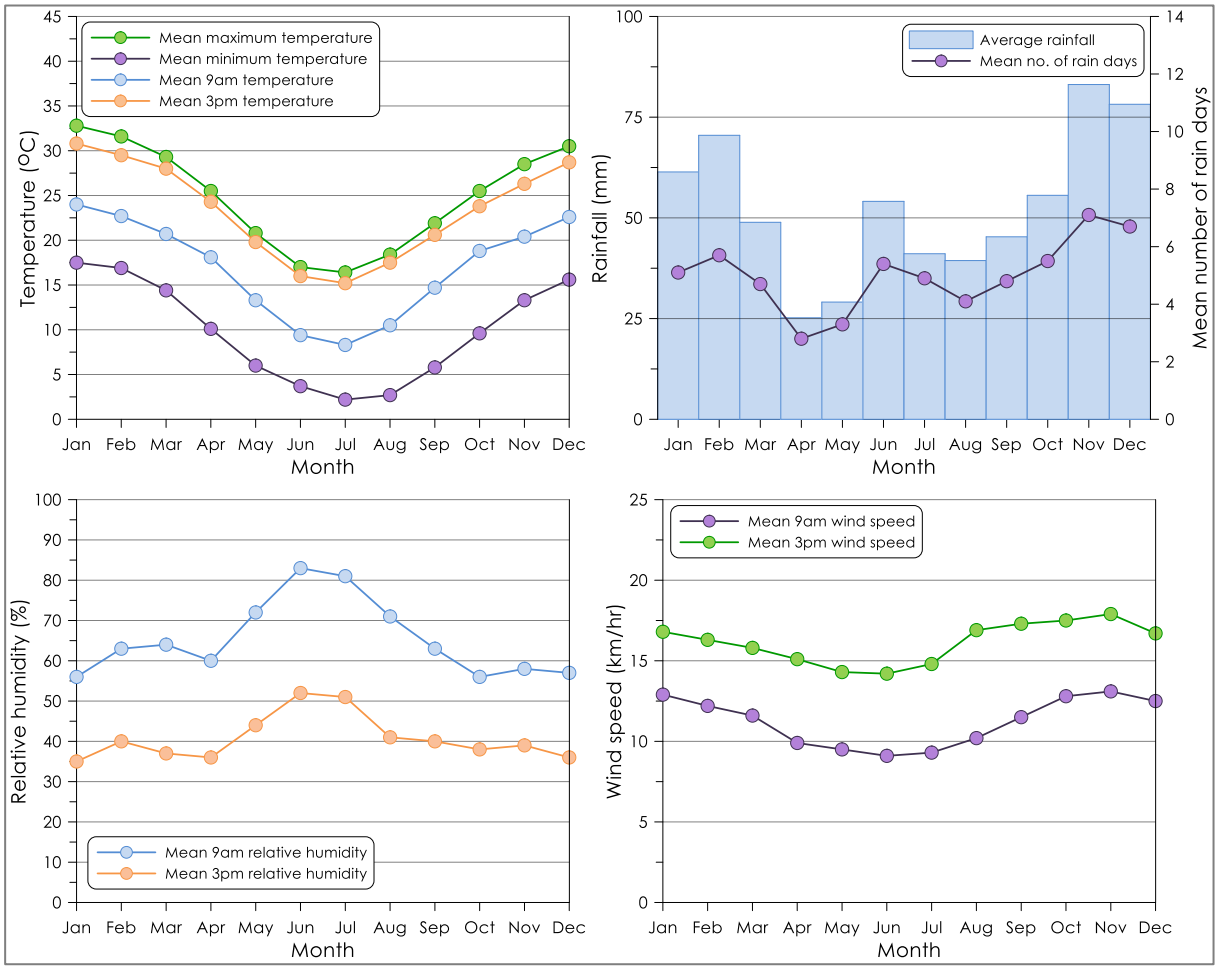

Figure 2-4 Monthly climate statistics summary – Tamworth Airport AWS

2.4.6 Vegetation

The Site and its surrounds have been significantly disturbed by clearance for roads, agricultural use, and commercial developments such as the adjacent ProTen Poultry Farm. The Site is currently used as a hobby farm and vegetation consists mostly of grasses, weeds and sparse paddock trees. One native vegetation community, Grey Box Grassy woodland is present on a small section of the property.

Within the property, there are vegetation remnants to the south east of the ORF with patches in a moderately degraded state. Generally, the land surrounding the Site is highly disturbed, having been cleared for agriculture and other commercial and infrastructure related uses.

3. Proposal Description

3.1 Overview

This chapter describes the proposal including preliminary design of the facility, ancillary activities and the associated construction activities to be undertaken. Key design drawings and plans are provided in **Appendix D**.

3.2 Proposal Area

The Site is located on part of Lot 61 DP 707563 and includes associated ancillary works as outlined in Section 1.3 and **Appendix D**. A Draft Conceptual Design for the TCS prepared by AP Business Technology Consultancy (August 2018) is also contained in **Appendix D.**

A plan of the site layout of the proposed facility is provided in Figure 3-1 and Figure 3-2 Detailed ORF Site Layout of the EIS. The swept path for a B-double to access the Site is shown in Figure 3-3**.** Further detailed design drawings are provided in **Appendix D.**

Composting Process

A commercially available enclosed TCS technology will be utilised for the pasteurisation process of the proposed ORF. For the purposes of planning the proposed facility, a typical commercial TCS technology was selected (**Appendix D**).

The TCS technology has a number of advantages over traditional windrow composting methods and technologies including:

- Improved odour and air quality control by enclosing the composting process and creating an airtight environment with all process air being collected and recycled into the system or cleaned via the biofilter;
- Improved aeration, air quality and temperature control within the enclosed composting tunnels using a system of water sprays and fans mounted on the top of the composting tunnels which ensures faster composting and temperature control;
- The applied pressurised aeration results in a more homogeneous and thorough material aeration profile for more reliable feedstock. There are virtually no anaerobic zones in the composting matrix. Typically, as anaerobic zones are responsible for most of the odours originating from organic material in other systems, the process air extracted out of a tunnel contains very low odour concentrations;
- Improved monitoring and control through computer-controlled aeration, air quality and circular water reuse processes which ensures:
    - Ongoing management of any potential operational and environmental impacts
    - Control of energy use (reduced energy usage per cubic metre of compost produced); and
    - Control and reduction of water use.
- Reduction in the time required for the composting process to provide outputs;
- The system is operationally flexible since composting takes place in discrete batches. Different grades of compost can be created simultaneously with different feedstock. With the tunnel system, each tunnel load can be treated independently, making it possible to adapt process parameters for optimal composting when deviations in the organic materials occur or potential impacts are present;

- Reduction in maintenance and repair costs for machinery and equipment by reducing exposure to the corrosive composting process. The fully-sealed nature of the system also protects surrounding building structures, without risk of corrosion, fogging or excessive condensation, thereby extending the life of the building; and

- Increased quantities of organic materials from various streams can be processed at a time.

3.2.1 Composting Duration

Material received will be processed over the two stages for approximately 10-12 weeks including:

- 28 days' pasteurisation (2x14 days) within the TCS (twice the duration recommended by the TCS supplier and the EPA – see **Appendix D**); and

- 6 - 8 weeks maturation in a windrow system on a maturation pad.

Utilising the TCS method almost halves the time of 16-20 weeks required to produce matured compost using standard windrow processes (as defined in AS4454).

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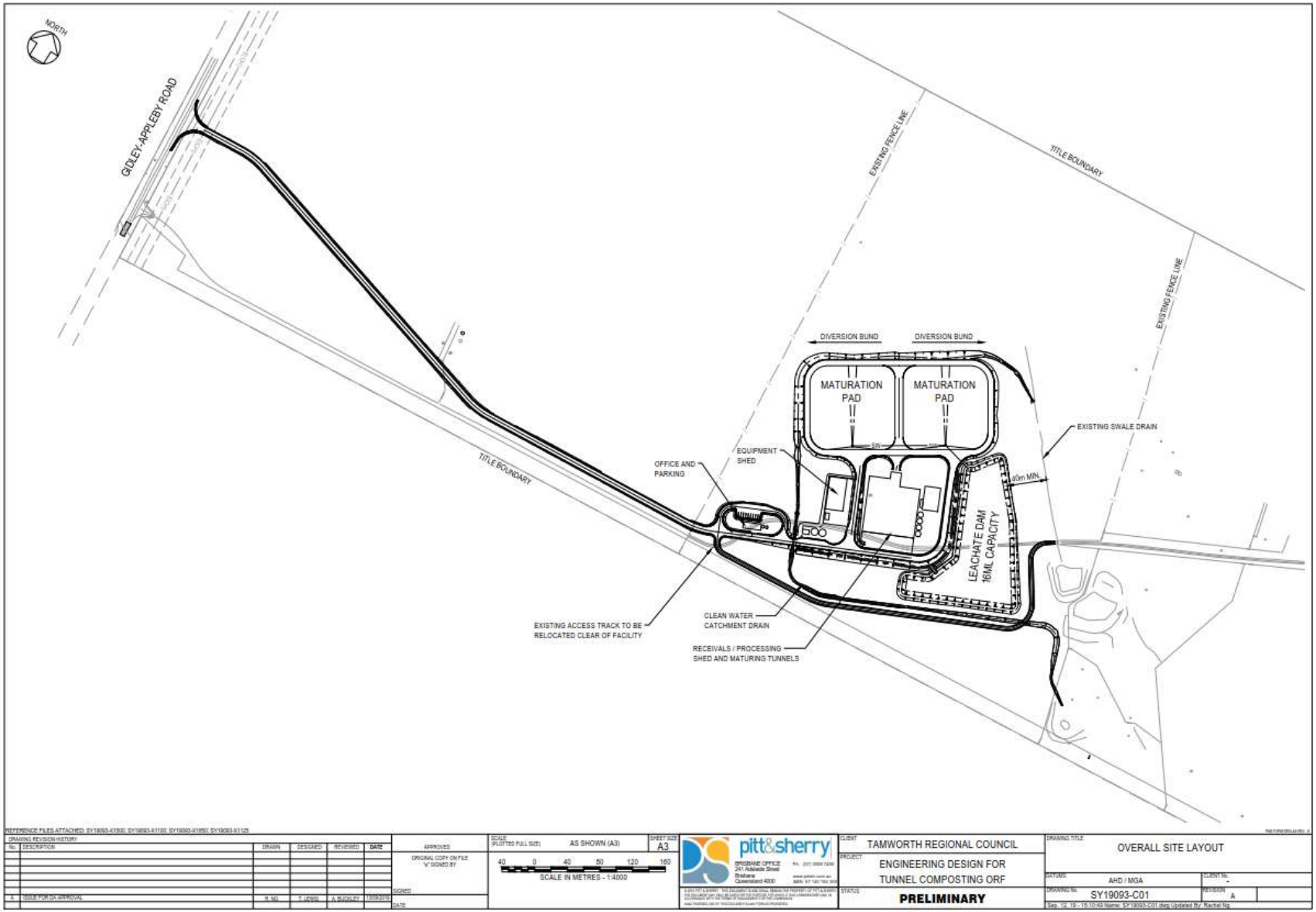

Figure 3-1 Concept Design – Proposed Facility Layout (Source: pitt&sherry)

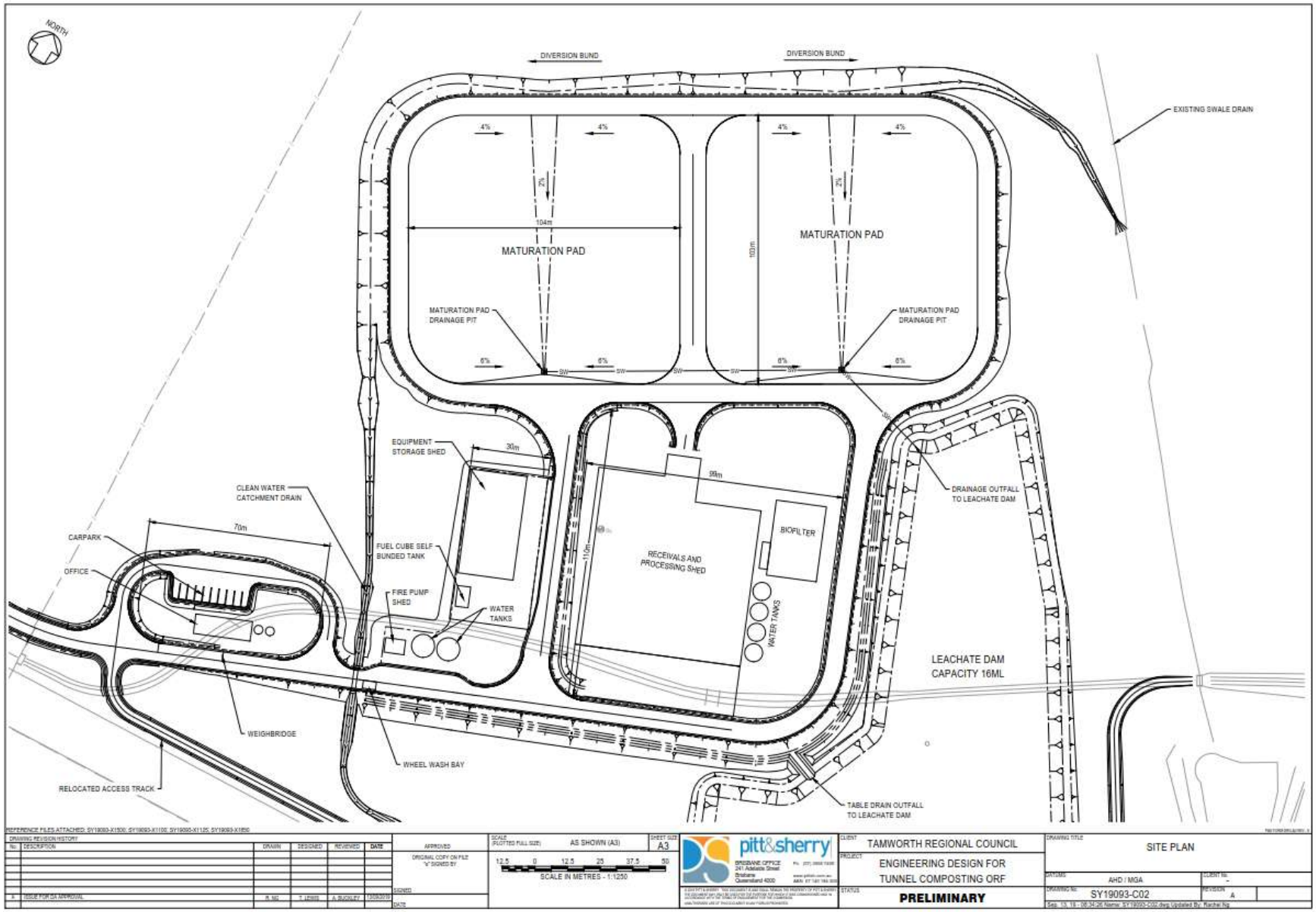

Figure 3-2 Detailed ORF Site Layout

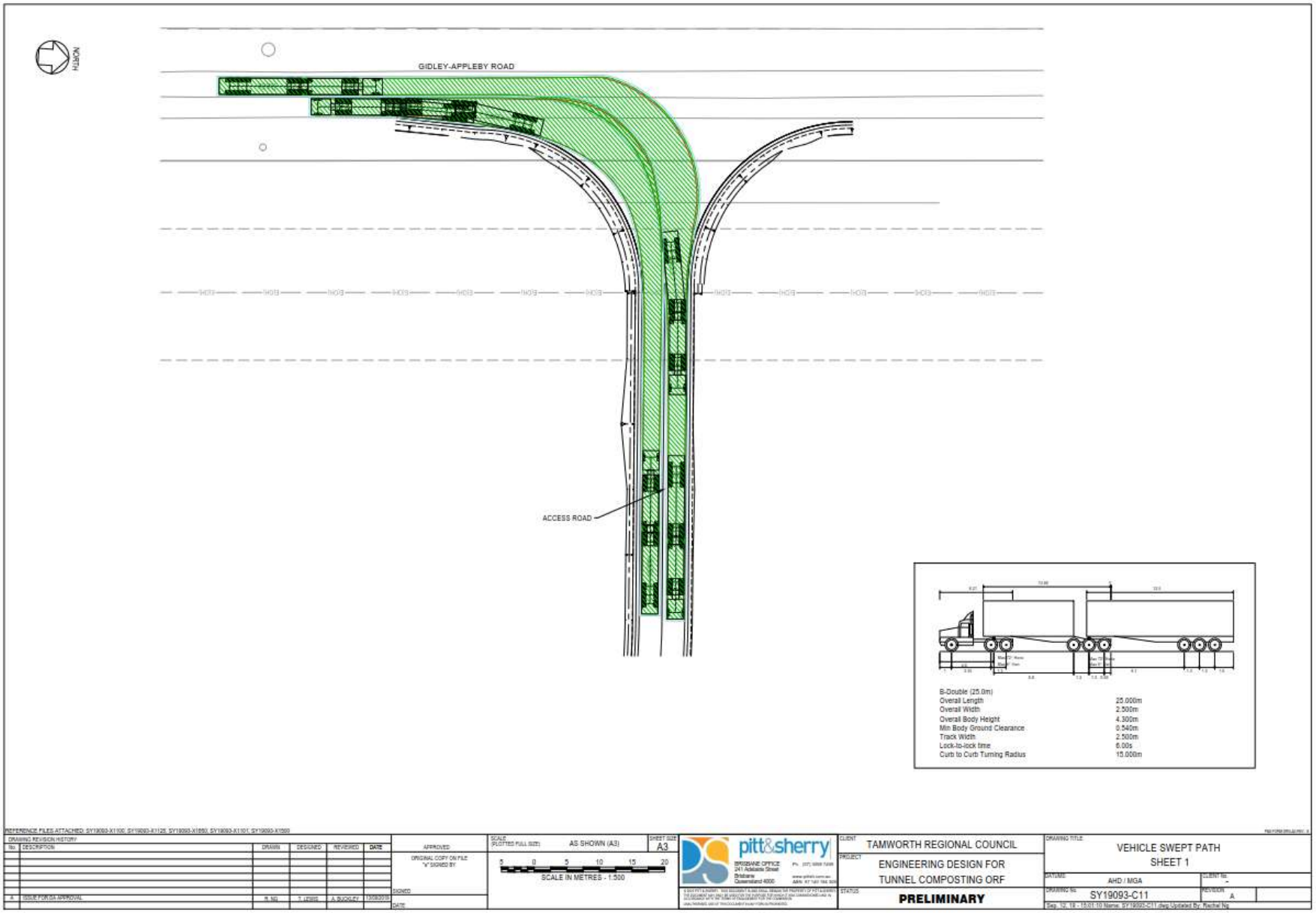

Figure 3-3 Vehicle Swept Path - Gidley Appleby Road and Access Point

3.3 Key Components

The proposed facility will utilise a commercially available TCS technology. Key features of the proposed facility and its components are outlined below. The design of the proposed facility has been undertaken in consideration of and compliance with relevant regulations, standards and guidelines including the Department of Environment and Conservation Environmental Guidelines – Composting and Related Organics Processing Facilities ('NSW EPA Guidelines').

Preliminary engineering design drawings are contained in **Appendix D** along with the Draft Conceptual Design for the TCS prepared by AP Business Technology Consultancy (August 2018).

3.3.1 Access and Egress

The Site will be accessed via a variety of vehicle types for receival and dispatch as well as staff via existing public roads and a new entry/exit point on Gidley Appleby Road. The largest vehicle to access the Site will be a B-double.

The following routes to/from the Site have been identified as most likely:

1. Oxley Highway – Appleby Lane – Gidley Appleby Lane;
2. Manilla Road – Appleby Lane – Gidley Appleby Lane; and
3. Wallamore Road – Gidley Siding Road – Gidley Appleby Lane.

As such, vehicles will enter the Site via a left or right-hand turn from Gidley Appleby Lane onto an internal sealed access road. Prior to unloading, vehicles will pass through a weighbridge.

Vehicles will exit via a right-hand turn onto Gidley Appleby Lane. This will be a sign posted restriction (No Left Turn). Prior to exiting the Site vehicles will pass through a wheel wash.

Access and egress will be strictly controlled with appropriate signage and road markings. The majority of traffic movements will be related to delivery and dispatch vehicles as outlined in Table 3-1**.**

Table 3-1 Vehicle Types

Vehicle Type	Vehicle Length	Receivals/Dispatch
Kerbside collection vehicles	6.5m and 10m	Receivals only
Dual axle tipper	9m	Receivals and Dispatch
Semi-trailer tipper	15m	Receivals and Dispatch
Truck and Trailer Combinations	18m	Dispatch only
Quad dog and trailer	20m	Dispatch only
B double	26m	Dispatch only

3.3.2 Internal Access Roads

A network of paved internal access roads will facilitate vehicle movements within the Site. All access roads will be paved with Pavement Type 2 designed for heavy vehicle access (**Appendix D**). All vehicle movements within the Site will be controlled and a speed limit of 10km/h will be implemented.

Access roads will be constructed and paved to minimise erosion, prevent tracking of sediment and to ensure that vehicle access is maintained in all weather conditions.

The Proposal has been designed to limit the need for reversing and as such the majority of movements throughout the Site are one way movements. Reversing will be required to access the Receivals Shed. The proposed access road layout and truck turning areas are shown in **Appendix D.**

3.3.3 Weighbridge and Site Office

The facility will include a weighbridge and Site Office at the entrance to the Site (see Figure 3-2). The weighbridge type will be determined during detailed design.

The office/amenities building will be approximately 22m long by 7.3m wide of hollow core construction with colour bond roof and plaster board internal walls. The building will include an:

- Office area;
- Lunchroom;
- Unisex disabled toilet; and
- Change room and shower.

The design of the building, entry stairs, ramps, landing and balustrades will be compliant with National Construction Code (NCC) and Disability Discrimination Act (DDA) requirements. The building has also been designed to allow for transient users (i.e. truck drivers) to access the amenities within the building, without accessing the office.

The office will include rooftop rainwater capture for use on-site and will meet water supply required for potable use with adequate treatment.

As outlined in the Water Balance prepared for the proposed facility (**Appendix N**), rainwater can meet and is suitable for the water supply required for potable and truck wash use. Rainwater collected for amenities use will be filtered twice (40 micron and 10 micron) followed by a UV filter.

Subject to licencing requirements, water supplied from the underground bore can be utilised to meet additional requirements for the truck wash and other operational activities in a dry year if required.

Design drawings showing the layout of the office and weighbridge are contained in **Appendix D**.

3.3.4 Receivals Shed

The Receivals Shed is designed to provide a suitable, controlled area for unloading of incoming organic materials.

The building has been designed to fully enclose the compostable materials dropped off on-site. The building is approximately 63.5m long by 35m wide and at its highest point sits 9m high.

The Receivals Shed will receive organic material directly from kerbside collection vehicles and other commercial vehicles. Within the Receivals Shed it will be processed to remove contaminants and also processed through a shredder before being transported into the TCS.

The initial decontamination process would involve the segregation of each delivered load within the Receival Shed, followed by a manual screening process and physical removal of contaminants into separate bins (i.e. landfill items or recyclable items).

Any contaminants or recyclable items would be stored within a dedicated area within the Receivals Shed prior to being transported for disposal or recycling to an appropriately licenced facility.

3.3.5 Tunnel Composting System

The TCS will be housed within a connecting shed adjacent to the Receivals Shed and comprise 7 enclosed tunnels for pasteurisation of the organic material. The tunnels (approximately 8m wide, 26m long and 5m high) will be arranged side by side. The system is supported by a biofilter with an integrated humidifier and a leachate collection system.

Each tunnel is self-operating and comprises an air duct system, blowers, process water collection and recycling systems and various process control features (temperature, pressure, etc.). The tunnel floor (i.e. aeration floor) allows the inflow of leachate and outflow of air into the composting material. Access to each tunnel is via a large front door, which during the pasteurisation process is locked hermetically to contain any odour and leachate.

The feedstock material is then placed into each tunnel individually and removed after 28 days by means of a front-end loader and transported to the outdoor maturation area.

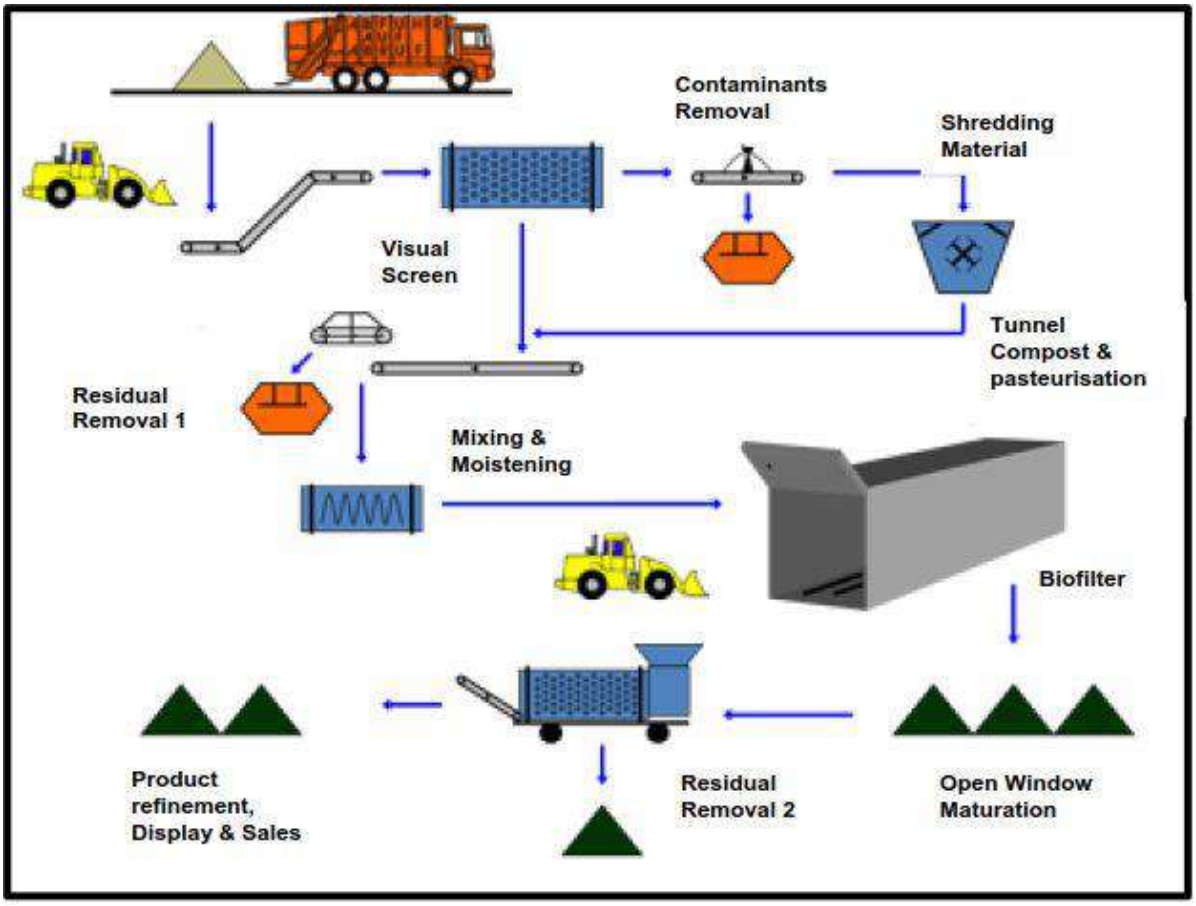

Figure 3-4 Tunnel Composting Principle (Source: AP Business Technology Consultancy) (Edited: pitt&sherry)

3.3.6 Biofilter

A biofilter will be positioned adjacent the TCS to filter all exhaust air from the tunnels and Receivals Shed for treatment and final discharge. This will efficiently minimise any potential offensive odours and deodorize the exhaust air. The

biofilter comprises a fan, humidifier, a roofed biofilter facility and biofilter media. The roof will protect the biofilter material, primarily from exposure to environmental elements and provide improved performance to ensure biological removal of odorous compounds.

The biofilter capacity could be increased to meet any future capacity requirements by increasing the biofilter media height accordingly (from 1m to about 1.5m).

3.3.7 Maturation Area

The maturation area is designed to provide a controlled area for the final stage of the composting process and comprises an area of approximately 21,000m^2 paved with Pavement Type 5 suitable for process areas in accordance with the NSW EPA Guidelines.

Batches will be transported directly from the tunnel to the maturation area in a grid format that aligns directly with the tunnels. For example materials from Tunnel A (Pasteruistaion A) will be transported from the tunnel onto the maturation pad as the same batch Maturation A as outlined in *Table 3-2*.

Table 3-2 Pasteurisation and Maturation Batches

PA	**PB**	**PC**	**PD**	**PE**	**PF**	**PG**
MA	MB	MC	MD	ME	MF	MG

The two areas represent the two stages of the composting process as follows:

- P is the pasteurisation within the tunnels (28 days); and
- M is the maturation on the maturation pad (6-8 weeks).

The nomenclature A – G denotes the batch number in the process.

The preliminary engineering design has identified that the area will have a nominal gradient of 2% within the centre of the maturation pad downslope, a nominal convergent north gradient of 4% and a nominal convergent south gradient of 6%. The gradient will be sufficient to:

- Drain all stormwater and excess process water from the maturation area to the leachate dam;
- Prevent run on and run off of stormwater and surface water;
- Prevent leachate contaminating the subsoil; and
- Prevent pooling of water on working surfaces.

All working surfaces will be constructed from inert, low-permeability materials and will be capable of withstanding extreme weather events and supporting the load of material and machinery without sustained damage thus protecting and maintaining the gradient.

A dispatch area for the facility outputs is provided adjacent the maturation area to enable the compost to be loaded onto vehicles for dispatch from the Site. The area will be paved with Pavement Type 5 (**Appendix D**) suitable for process areas in accordance with the NSW EPA Guidelines.

Dedicated drainage lines will transport any stormwater runoff water from this area to the leachate dam.

3.3.8 Ancillary Infrastructure

A number of ancillary facilities and infrastructure will also be provided on-site as outlined below:

- A wash bay will be located on-site to accommodate a maximum truck width of 2.8m to wash both front and rear wheels. Water will be recycled within the wheel wash;
- An equipment shed for storage and servicing of the equipment and vehicles to be used on-site. Key features include:
    - 40m long by 20m wide steel frame, braced portal frame structure;
    - 8m high with a 2 duo-pitch colour bond roof; and
    - Rainwater collected from the equipment shed will be reused on-site.

- The Site will include operational lighting in key areas and along internal access roads as outlined in **Appendix D**. A perimeter fence with vermin mesh, signage and Site landscaping has also been included in the preliminary engineering design to manage light spill from the Site and will be refined during detailed design; and
- TRC propose to establish landscaping which will include establishment of vegetation screens at the frontage of the Site as well as along the perimeter fencing lines. Details of the landscaping proposed within the facility is shown in the landscape plan in **Appendix D**.

3.3.9 Water Management Infrastructure

The management and storage of water on-site has been designed to ensure the following objectives are met:

- Capture and store rainwater from building roofs for use on-site;
- If required, use of underground bore water when water supplies are low;
- Store imported water (process) for use on-site;
- Separation of clean (stormwater) and dirty (leachate) water across the Site;
- Storage of clean (stormwater) and dirty (leachate) water for use on-site e.g. dust suppression;
- Prevention of uncontrolled discharge of water from the Site;
- Prevention of leachate contaminating the subsoil and groundwater; and
- Prevention of water pooling on working surfaces.

Water will primarily be sourced from on-site dams and rainwater tanks.

During dry years, potable water may need to be imported and process water may be obtained from the bore located in the south-east corner of the Site.

A water balance was prepared for the Site (**Appendix N**) which included identification of all water inputs, outputs and calculation of the water requirements for operation of the proposed facility based on available data and the preliminary design.

The dimensions and sizes calculated in this water balance have been incorporated into the design of the proposed facility. However, due to Site considerations and constructability aspects, the designed storage volumes do not always equate to the maximum volume that could be captured as identified in the water balance (**Appendix N**).

The capture areas and storage volumes as calculated in the water balance (**Appendix N**) are outlined in Table 3-3. The storage volumes proposed for the Site are based on optimising use of rainwater for reuse on-site and the preliminary engineering design and may be refined during detailed design.

Table 3-3 Water Capture and Storage Volumes

Area	Area m^2	Water Type	Mean Annual Runoff Volume **(m^3 per annum)**	Storage Type	Designed Storage Volume
Office/Amenities Building roof	158	Rainwater	Not modelled	Tank	20kL
Equipment Shed roof	840	Rainwater	Not modelled	Tank	300kL
Process building and biofilter	4,715	Rainwater	2,980	Tank	300kL
Non-Process Area runoff	153,400	Stormwater	6,530	Stormwater dam	2.4ML
Process Area runoff	13,600	Leachate	3,500	Leachate dam	16ML
Maturation Pad	21,000		4,240		
Imported – Process Water (UV treated on-site)	N/A	Underground Bore	N/A	Underground	N/A
Imported – Firefighting (trucked to site in tankers)	N/A	Potable Water	N/A	Tanks	590KL (effective)

3.3.10 Leachate Management

Leachate is defined as any water that contacts and may be grossly contaminated by raw or processed organic materials. Contaminants include organic matter (biochemical oxygen demand – BOD), nutrients (nitrogen and phosphorus), tannins and microbial pathogens. Leachate generally poses the greatest risk to water quality. Leachate is distinct from the relatively cleaner stormwater generated in other parts of the Site, that does not come in contact with bulk organic materials.

The facility has been designed to prevent mixing of relatively clean stormwater with the organics received and the composting areas. Any surface water that comes in to contact with the processing and/or storage areas is managed as leachate. All leachate run-off generated will flow to a leachate dam using gravity in dedicated drainage lines, which will prevent leachate from contaminating the subsoil.

The leachate dam has been sized to accommodate 16ML as determined in the Water Balance (**Appendix N**). The leachate dam has been designed with a freeboard and spillway and levels will be monitored regularly alongside weather forecasts to ensure the dam does not overflow during rain events.

Currently the design includes freeboard that can accept a 1-in-10 year 24-hr rainfall event for additional storage and reuse. It is unlikely that the leachate dam would reach capacity however, should monitoring identify the need, excess leachate would be pumped to a storage tank on-site to ensure dam levels remain suitable for Site operations and forecasted weather events.

3.4 Utilities

3.4.1 Water

As outlined in Section 6.8, water for use on the Site will be obtained from four key sources:

- Stormwater will be collected in the existing on-site stormwater dams;
- Process water will be collected in a new Leachate Dam and reused within the tunnel system;
- Rainwater will be collected from building roofs across the Site and stored in water tanks to use on-site;
- Bore Water will be obtained via a bore located in the south west corner of the proposed ORF; and
- Imported fire suppression water and back up potable water will be transported to the Site via water tanker and stored in tanks.

All captured process water (leachate dams) will be reused on-site within the contained composting tunnel system. Run off from non-process areas will be captured within the Stormwater Dam and reused on-site for domestic and operational use as well as for moistening of the maturation area. Emergency eyewash and shower equipment may require a small separate rain water tank to ensure water supply is always full and free of contaminants. This tank would collect the rain water in the first instance and overflow to the main rainwater collection tank. This tank setup will be outlined during the detailed design for the ORF.

3.4.2 Sewage

An On-site Sewage Management (OSM) System is proposed for use on-site as there are no existing sewer services in the area. There is over 100 hectares not used by the Proposal, allowing space for irrigation of secondary treated effluent from a domestic OSM system. The details of an appropriate OSM system would be outlined in an application to Council under Section 68 of the *Local Government Act 1993*.

3.4.3 Electricity

Supply of low voltage power to the Site will be via a new pole-mounted transformer located in the road reserve west of the proposal Site, south of the entry gate to the Site. This will connect to an existing pole and line on Gidley Appleby Road and run-down Gidley Siding Road and Wallamore Road which connects to the Tamworth Town Centre. The works associated with this supply will be undertaken by Essential Energy.

3.4.4 Telecommunications

Supply of telecommunications including telephone and data systems will be identified during detailed design. No significant works are anticipated to enable this supply.

3.5 Material Sources and Quantities

The proposed ORF has been designed to process up to 35,000 tpa of source separated organic material, which is a known product generated in the Tamworth LGA. After processing, it is anticipated the facility would produce in the order of 22,000 tpa of composted product. Table 3-4 summarises the source, quantity and classification of organic material to be received at the facility.

Table 3-4 Organic materials sources and quantities

Type	Classification	Source	Quantification (t/a) – at capacity	Percentage
Food organics and garden organics (FOGO)	General Solid Waste (Putrescible)	Domestic kerbside	12,500	36
Garden organics (GO)	General Solid Waste (Non-Putrescible)	Domestic/Commercial (via FRWMF)	9,000	25
Timber	General Solid Waste (Non-Putrescible)	Domestic/Commercial (via FRWMF)	1,600	5
Paunch	General Solid Waste (Putrescible)	Abattoirs	3,800	11
Highly Putrescible (, Offal,)	General Solid Waste (Putrescible)	Intensive meat production	3,450	10
Highly Putrescible (Dissolved Air Flotation (DAF) Unit Sludge)	General Solid Waste (Putrescible)	Intensive meat production	2,400	7
Liquid Waste	Liquid Waste	Grease trap, residual septic etc.	2,250	6
Total			**35,000**	**100**

3.6 Operation of the Facility

3.6.1 Receivals

All material delivered to the Site will be received into the large enclosed and air controlled receivals shed or liquid waste storage tanks for processing.

The Receivals Shed will be fully enclosed with automatic closing access doors to minimise emissions of dust, odour and litter. The building will include a bunded hardstand (Pavement Type 5) and include areas for decontamination screening, storage, shredding and mixing prior to loading into the composting tunnels.

The liquid waste will be incorporated into the mixing process within a batching pit (or similar), located within the enclosed Receival Shed.

Inspection and screening of received organics will be conducted within the Receivals Shed and loads with excessive

contamination will be rejected. Any physical items of contamination will be manually removed prior to processing.

3.6.2 Pasteurisation

Following receival into the Receivals Shed, materials are decontaminated and screened, shredded and mixed before being loaded into the tunnels for pasteurisation. The facility will utilise a two-stage tunnel composting process comprising 28 days' residence time (2 x 14 days) to guarantee pasteurisation. During the first 14 days composting process, the material will be pasteurised at around 55-65 ºC to destroy pathogens and denature weed seeds.

The output would be pasteurised material with an 'earthy' odour. The biological activities in this pasteurised product will have significantly declined allowing outside maturation. Further information is contained within the APBTC Conceptual Design contained in Appendix D.

3.6.3 Maturation

The pasteurised product from the tunnels will be transported by front end loader to the maturation area in stockpiles of up to 2-3 metres high. Stockpiles will be formed in a trapezoidal shape in windrows 40m in length allowing the compost to mature for up to 6-8 weeks with some windrow moistening and turning as required.

3.6.4 Composting Monitoring, Sampling and Testing Procedures

The composting process will be monitored in accordance with framework provided by AS4454 (Composts, soil conditioners and mulches standards) and an Environmental Management System (EMS) approved by TRC and the NSW EPA. Material sampling, quality testing, field testing and operational auditing will also be undertaken. The testing of the material will include at least the following:

- Temperature testing of each compost batch on a daily basis;
- Moisture testing of each compost batch on a weekly basis or as required;
- pH testing of compost as required;
- Oxygen and/or carbon dioxide testing of compost batches as required;
- Product maturity using Solvita test kits or equivalent; and
- Identification of physical and chemical contaminants in the final product.

3.6.5 Safe Storage and Disposal of Process Residuals and Contaminated Organics

The proposed facility has been designed to securely store all organic materials, contaminated products and process residues that cannot be beneficially processed at the facility, until they can be disposed of at a suitably licenced facility.

An Operational Environmental Management Plan (OEMP) will be prepared for the Proposal with a Waste Management Plan (WMP). Matters to be included in this WMP are outlined in Section 6.11.

3.6.6 Final Product

The proposed ORF will produce various grades of soil conditioners and composted mulches, such as:

- <10mm composted soil conditioner;
- 10-20mm composted fine mulch; and
- 20-30mm composted mulch.

The compost products produced at the proposed facility will be of a high quality suitable for sale in both agricultural and urban amenity markets such as landscaping. During the first 14 days composting process, the material will be

pasteurised at around 55-65 ºC to destroy pathogens and denature weed seeds. The biological and physical properties of the products will be in accordance with Australian Standard AS4454-2012: Composts, Soil Conditioners and Mulches (2012).

Chemical properties will be fit-for-purpose and in accordance with the requirements of applicable Resource Recovery Orders and Exemptions as published by the NSW EPA. In order to produce consistent products that meet customer specifications and comply with all regulatory requirements, the facility will undertake ongoing material sampling, quality testing, field testing and operational auditing.

Non-compliant product will be further processed or disposed of at a facility licensed to accept it as a waste. Any physical contaminants will be removed through manual picking and/or screening methods and will be classified and transported to a suitably licenced facility for disposal.

3.6.7 Product Storage

On completion of the composting process the batches will be moved to the product storage area where the product will be screened, sampled and tested.

3.6.8 Recycled Organic Product Markets

Three categories of recycled organic products will be produced from the ORF. Table 3-5 outlines the estimated market price, projected ORF generation and suggested local market outlets. Based on observations at existing composting facilities, it is expected that there will be approximately 5% contamination during the composting process and this contamination (residual waste) will be removed and disposed of at the FRWMF or other suitably licensed facility.

Table 3-5 Potential recycled organic products from the ORF and market outlets (Source: Tamworth Regional Council)

Recycled organic product	Potential market price ($/tn)	Projected ORF generation (t/a)	Local Market Outlets
Composted Soil Conditioner (<10mm)	$35	8,550 (45%)	Urban Amenity (residents, Council, nurseries, landscape suppliers) Intensive Agriculture Extensive Agriculture
Composted Fine Mulch (GRADE 10-20mm)	$28	4,750 (25%)	Urban Amenity (residents, Council, landscape suppliers) Intensive Agriculture (tree farmers)
Composted Mulch (GRADE 20-30mm)	$10	2,850 (15%)	Urban Amenity (residents, landscape suppliers, Council). Intensive Agriculture (farmers)

3.6.9 Safe Storage Procedures and Disposal of Process Residuals and Contaminated Organics

The proposed facility has been designed to securely store all organic materials, contaminated products, wastes and process residues that cannot be beneficially processed at the facility, until they can be disposed of at a suitably licenced facility.

An Operational Environmental Management Plan will be prepared for the Proposal with a Waste Management Plan (WMP). Matters to be included in this WMP are outlined in Section 6.11.

3.6.10 Plant and Equipment

A range of plant and equipment is likely to be required for operation of the proposed facility as outlined in Table 3-6**.** The final plant and equipment used on-site will be determined by the operator of the facility.

Table 3-6 Operational Plant and Equipment

Item	Type/Details	Quantity
Shredder/Grinder	Horizontal >400 kW	1
Wheel Loader	>120kW Maximum working height >4 m	2
Screen	Trommel, flip or star suitable for screening MC up to 50%	1
Conveyor Sort	Raised and enclosed with a controlled environment for pickers	1
Windrow turner		1

3.6.11 Operational Traffic

During operation, the facility is expected to generate up to 20 delivery trucks (40 truck movements) in a peak hour. Operational traffic will include: kerbside collection vehicles, dual axle tipper, semi-trailer tipper, truck and trailer, quad dog and trailer, B double truck and staff and maintenance vehicles. No public or associated vehicles will access the Site.

3.6.12 Hours of Operation

The facility's operating hours are expected to be between 8am to 4:45pm Monday to Sunday.

All Site activities will be performed between 8am to 4:45pm Monday to Sunday with the exception of the fan / water sprays / aeration system, which will operate continuously as required.

3.6.13 Employment

Once operational the proposed facility will employ approximately 6 full time employees.

3.6.14 Operational Environmental Management

The operational environmental management for the Site will be addressed by the operational contractor and will be managed through an OEMP.

3.7 Construction Staging

The key stages of construction are outlined below.

3.7.1 Stage 1 – Ancillary and Enabling Works

Ancillary and enabling works will be completed in Stage 1 including road upgrades and connection of utilities to the Site.

3.7.2 Stage 2 – Main Works

The main works to be completed in Stage 2 include the following key activities:

- Site mobilisation:
    - Establishment of site compound and stockpile sites;
    - Services search; and
    - Establishment of environmental management measures including erosion and sediment controls.
- Excavation & Civil works:
    - Site stripping, clearing and rubbish removal;
    - Vegetation removal (existing pasture and weeds);
    - Cut and fill earthworks (51,000m^3); and
    - Construction of leachate dam.
- New building works;
- Pavement works:
    - Construction of impermeable working pads for the compost processing areas.
- External and miscellaneous works:
    - Fire services;
    - Leachate storage tanks;
    - Water storage tanks;
    - Weighbridge and Site Office;
    - Wheel washer;
    - Power reticulation;
    - Perimeter lighting;
    - Plumbing and on-site sewage management system installation; and
    - Landscaping.

All excavated material (excluding weeds and organic materials) will be reused on-site as fill material. No imported fill material is anticipated to be required for the construction works.

Materials for construction of pavements and structures on the Site, in accordance with the engineering design, will be imported to Site and stockpiled temporarily.

3.7.3 Duration of Works

The construction phase for the proposed facility is anticipated to take approximately 8-12 months.

All works will be undertaken during standard construction hours:

- 7am to 6pm Monday to Friday;
- 8am to 1pm Saturday if required; and
- No works on Sundays or public holidays.

3.7.4 Plant and Equipment

A range of plant and equipment is required for construction. An indicative plant and equipment list are outlined in Table 3-7 though the plant selection will be dependent on the detailed construction methodology and preferences of the chosen construction contractor.

Table 3-7 Construction Plant and Equipment

Item	Quantity
30t Excavator	1
20t Excavator	2
8t Excavator	1
14M Grader	1
Smooth Drum Roller	2
Pad Foot Rollers	3
Water Carts	1
DPU and Wacker Plates	1
20t Crane	1
10t all-terrain crane	1
Elevated work platforms	2
Articulated Dump Trucks	2
Knuckle boom	1

3.7.5 Services

Services for the construction phase will be supplied as follows:

- Telecommunications – no service required;
- Electricity – on-site generators; and
- Sewer – temporary toilets (portaloos) with offsite disposal of waste.

Prior to the commencement of works on-site a complete services search including a Dial Before You Dig (DBYD) search will be undertaken to identify any services which could be affected by the construction works.

3.7.6 Construction Traffic

A maximum of 20 truck movements per day are expected during construction of the proposed facility. These movements will primarily be related to delivery of materials and movements on-site for a short-term period. Some light vehicles for construction workers travelling to and from the Site are also expected.

4. Statutory Planning Framework

This chapter outlines the statutory framework that applies to the Proposal. It provides an overview of the applicable environmental planning approval process under NSW and Commonwealth legislation and details of other NSW legislation relevant to the Proposal.

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation) provide the framework for assessment and approval of development in NSW and are further outlined in Section 4.2.1.

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment (DoE) and provides a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as matters of 'national environmental significance' (MNES). Under Part 9 of the Act, an action that "has, will have or is likely to have a significant impact on a matter of National Environmental Significance" (MNES) may not be undertaken without prior approval from the Commonwealth Minister, as provided under Part 9 of the EPBC Act.

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World heritage properties;
- National heritage places;
- Wetlands of International importance;
- Listed nationally threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions including uranium mining; and
- Water resources in relation to coal seam gas or large mining development.

The purpose of a referral is to obtain a decision on whether the proposed action will need formal assessment and approval under the EPBC Act.

An assessment of whether the Proposal may have a significant impact on any matters of NES or on the environment of Commonwealth land was undertaken during the preparation of this EIS and is provided in Table 4-1.

The assessment determined that the proposal is unlikely to impact any MNES; therefore, a referral will not be made to the Commonwealth Minister for the Environment.

Table 4-1 MNES considered

Matters of National Environmental Significance	Consideration
World Heritage Properties	The Site is not identified as, or in close proximity to World Heritage Properties.
National Heritage Places	The Site does not contain nor is it in close proximity to National Heritage Places. The development will not impact upon any National Heritage Place either directly or indirectly.
Wetlands of International Importance (declared RAMSAR Wetlands)	The Site is not located within 10km of Wetlands of International Importance. The Proposal will not impact upon any Wetlands of International Importance (declared RAMSAR Wetlands) either directly or indirectly.

Matters of National Environmental Significance	Consideration
Great Barrier Reef Marine Park	The Great Barrier Reef Marine Park does not occur within or near the Site.
Commonwealth Marine Areas	The Site is not located within or in close proximity to a Commonwealth Marine Area
Listed Threatened Ecological Communities	Four Threatened Ecological Communities (TEC) were recorded with 10 km of the Site; two of the communities are recorded as likely to occur within that area and the remaining two as may occur. Due to the predominantly cleared nature of the Site, TECs are not considered to have the potential to be impacted by the proposed development. See Section 6.4 and **Appendix H** for further details.
Nationally Listed Threatened Species	26 species listed under the EPBC Act have been recorded or have suitable habitat within a 10 kilometre radius of the Site (18 fauna species and 8 flora species). Two threatened fauna species listed under the EPBC Act were identified as likely to occur within the vicinity of the Site. No threatened species were identified on Site during an inspection undertaken by ecologists. The potential for the Proposal to significantly impact on individuals or local populations of national threatened species is unlikely. See Section 6.4 and **Appendix H** for further details.
Nationally Listed Migratory Species	One migratory marine bird species, four migratory terrestrial species and six migratory wetlands species listed under EPBC Act have been recorded or have potential suitable habitat within 10 km of the Site. The *Fork-tailed Swift* and *White-throated Needletail* were identified as likely to occur within the Site. The proposed development is unlikely to substantially modify, destroy or isolate an area of important habitat, result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat or seriously disrupt the lifecycle of an ecologically significant proportion of the population of these species. See Section 6.4 and **Appendix H** for further assessment.

4.1.2 Native Title Act 1993

The *Native Title Act 1993* recognises that Aboriginal people have rights and interests to land and waters which derives from their traditional laws and customs. Native title may be recognised in places where Indigenous people continue to follow their traditional laws and customs and have maintained a link with their traditional country. It can be negotiated through a Native Title Claim, an Indigenous Land Use Agreement (ILUA) or future act agreements.

An ILUA is an agreement between a native title group and other parties who use or manage the land and waters. The ILUA process allows for negotiation between indigenous groups and other parties over the use and management of land and water resources, and the ability to establish a formal agreement. An ILUA is binding once it has been registered on the Native Title Tribunal's Register of Indigenous Land Use Agreements.

A search of the National Native Title Register was conducted and no native title determinations were identified in Tamworth Regional Council Local Government Area. A search of the Register of Native Title Claims identified one claim by the Gomeroi People which was entered on to the register on 20 January 2012.

4.1.3 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) provides a single national framework for the reporting and dissemination of information about the greenhouse gas (GHG) emissions, greenhouse gas projects, and energy use and production of corporations. It makes registration and reporting mandatory for corporations whose energy production, energy use or greenhouse gas emissions meet specified thresholds. The Proposal is expected to reduce GHG emissions by diverting organic materials from ending up in landfill.

4.2 State Legislation

4.2.1 Environmental Planning and Assessment Act (EP&A Act) 1979

The EP&A Act is the principal piece of legislation covering assessment and determination of development proposals in

NSW. It aims to encourage the proper management, development and conservation of resources, environmental protection and ecologically sustainable development.

The objectives of the EP&A Act are summarised in Table 4-2 below.

Table 4-2 Objectives of the EP&A Act

Objective	Comments	Proposal Consistent with Objective
Encourage the proper management, development and conservation of natural and artificial resources	The Proposal seeks to construct and operate an ORF. The potential environmental impacts have been assessed and mitigation measures proposed within this EIS. The assessment identifies that the Proposal, with implementation of the recommended management and mitigation measures, can be undertaken without having a significant impact on the environment and address criteria for an ecologically sustainable development.	Yes
Encourage the promotion and co-ordination of the orderly and economic use and development of land	The orderly and economic use of land is best served by development which is permissible under the relevant planning regime and predominantly in accordance with the prevailing planning controls. The Proposal comprises a permissible development which is consistent with the statutory and strategic planning controls. As detailed in this EIS, the Proposal will contribute to the sustainable management of organic materials and result in positive economic impacts, with appropriate mitigation measures and management strategies being proposed to reduce adverse environmental impacts.	Yes
Encourage the protection, provision and co-ordination of communication and utility services	Power supply to the Site will be via a new pole mounted transformer located in the road reserve south of the entry to the Site. An on-site Sewage Management System will be utilised and the Site will not connect to an existing sewer service. Water will be supplied via a bore located nearby, and via rainwater collection on-site. Telecommunications supply to the Site will be identified during detailed design.	Yes
Encourage the provision of land for public purposes	This objective is not applicable to the Proposal as no public land is located within the Site. No public land is predicted to be affected by the Proposal.	Yes
Encourage the provision and co-ordination of community services and facilities	The Proposal will not adversely affect community services and facilities.	Yes

Objective	Comments	Proposal Consistent with Objective
Encourage the protection of the environment	This EIS assesses in detail the potential for the Proposal to impact upon the local environment and identifies mitigation measures to reduce potential impacts. The Proposal is not expected to have significant adverse impacts on the environment.	Yes
Encourage ecologically sustainable development (ESD)	The proposal is consistent with the principles of ecological sustainable development as outlined in Chapter 8 of this EIS.	Yes
Encourage the provision and maintenance of affordable housing	This objective is not applicable to the Proposal.	Yes
To provide increased opportunity for public involvement and participation in environmental planning and assessment	As outlined in Chapter 5, TRC has engaged with the community as part of the environmental assessment process. Public exhibition and the development assessment process provide further opportunity for public participation in the consideration of the Proposal.	Yes

The Proposal is consistent with the nominated objectives of the Act and is considered capable of fulfilling the statutory requirements. The Secretary of the DPIE has provided the assessment requirements for the EIS, (SEARs) as discussed in Section 1.6.

Designated Development

The Proposal meets the definition of designated development under Schedule 3: Clause 13 (waste management facilities or works) of the Environmental Planning and Assessment Regulation 2000, which refers to:

Composting facilities or works (being works involving the controlled aerobic or anaerobic biological conversion of organic material into stable cured humus-like products, including bioconversion, biodigestion and vermiculture):

a) that process more than 5,000 tonnes per year of organic materials, or

b) that are located:

(i) in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area, or

(ii) in an area of high water table, highly permeable soils, acid sulphate, sodic or saline soils, or

(iii) within a drinking water catchment, or

(iv) within a catchment of an estuary where the entrance to the sea is intermittently open, or

(v) on a floodplain, or

(vi) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

The resource recovery facility (composting) proposes to process 35,000 tpa of organic material. Accordingly, the development is designated development under Section 4.10 of the Act. Under Section 4.12(8) of the Act, applications for designated development are to be accompanied by an EIS.

Integrated Development

In accordance with Section 4.46 of the EP&A Act, the Proposal would also be Integrated Development as it requires development consent and the following approvals:

- An EPL under the Section 43 (a), 47 and 55 of Protection of the Environment Operations Act 1997, to authorise the carrying out of a scheduled activity.
- Approval under Section 138 of the *Roads Act 1993* for the undertaking of work in, on or over a public road; and
- Approval under Section 89, 90and / or 91 under the Water Management Act 2000 for water use.

4.2.2 Protection of the Environment Operations Act, 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the EPA and provides for a system of EPLs for scheduled development work and activities, as well as the ability to issue environmental protection notices for pollution and waste management. Environmental offences are also described under the POEO Act.

The Proposal has been determined to be a scheduled activity under the POEO Act (Schedule 1, Clause 12 Composting and Clause 42 Waste Storage) and will require an EPL prior to operation. Liaison with the relevant agencies will be undertaken to ensure TRC's obligations under the POEO Act are met.

4.2.3 Protection of the Environment Operations (Waste) Regulation 2014

Under this regulation pursuant to the POEO Act, the organic materials that will be received at the ORF are deemed to be "waste" and processed organics materials from the ORF are not precluded from being considered "waste" under the regulation. Therefore, the application of the ORF product land is restricted, except with the benefit of a General or Specific Exemption issued under Clause 91 and 92 of the regulation.

A current exemption for resource recovery wastes can be used without seeking EPA approval but all conditions of the relevant exemption must be complied with for the supply and re-use to be legal. A current Compost Exemption 2016 issued by the EPA is in place. Should other exemptions be required they will be applied for.

Under clause 93, the EPA may impose requirements on those operating under a resource recovery exemption. A resource recovery order, the compost order 2016, is currently in place for composting. The inputs and outputs from the ORF will be managed in accordance with current exemptions and orders. The operator will keep records as required by any Resource Recovery Orders as applicable to the Proposal.

4.2.4 Water Management Act 2000

The objectives of the *Water Management Act 2000* (WM Act) are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations.

Under this Act, the Site is within the area applicable to the Water Sharing Plan for the Peel Valley Regulated, Unregulated, Alluvium and Fractured Rock Water Sources. The plan includes rules for protecting the environment, extractions, managing licence holders' water accounts, and water trading in the plan area.

It is expected that a new or upgraded groundwater bore would be established on-site to provide a secure source of production water for operational use including for use in the composting process and dust suppression. Whether a new bore or an upgraded bore, these groundwater works would be subject to licensing and other approvals under the WM Act which would be sought post development consent.

Harvesting of surface water is exempt from licensing or the quantity is below the applicable Harvestable Rights allowance and therefore the Proposal does not need to address the NSE Farm Dams Policy. Surface water capture will be undertaken for water quality control purposes and re-used on-site; therefore, the proposed tanks, leachate and stormwater ponds are excluded from licensing needs.

Further information is outlined in Sections 6.8 and 6.9.

4.2.5 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR) provides the legislative framework to manage resource recovery in NSW and under which the Waste Avoidance and Resource Recovery Strategy can be implemented.

The objects of this Act are:

(a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,

(b) to ensure that resource management options are considered against a hierarchy of the following order:

(i) avoidance of unnecessary resource consumption,

(ii) resource recovery (including reuse, reprocessing, recycling and energy recovery),

(iii) disposal,

(c) to provide for the continual reduction in waste generation,

(d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,

(e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,

(f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,

(g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,

(h) to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.

The operation and design of the Proposal will be managed in accordance with the principles of the waste hierarchy and in accordance with the WARR act as outlined in Section 6.11.

4.2.6 Biodiversity Conservation Act 2016

Part 7 of the *Biodiversity Conservation Act 2016* (BC Act) specifies the environmental assessment requirements for activities being assessed under Part 4 of the EP&A Act. If a significant impact is likely, the DA is to be accompanied by a Biodiversity Development Assessment Report.

Threatened species and communities listed under the BC Act were identified as potentially being impacted by the works. Assessments of Significance were undertaken for these matters and concluded that a significant impact is not likely to result and therefore a Biodiversity Development Assessment Report is not required.

The Biodiversity Offset Scheme (BOS) under the BC Act may be applicable to the development if the relevant thresholds are triggered. It was determined that thresholds were not triggered and therefore a Flora and Fauna Assessment (FFA) has been prepared to assess the impacts on biodiversity of the proposed development and is provided in **Appendix I**. A

summary of the impacts to biodiversity are provided in Section 6.4 of this EIS.

4.2.7 Roads Act 1993

Section 138 of the *Roads Act 1993* requires that consent be obtained prior to disturbing or undertaking work in, on or over a public road.

The Proposal will require the establishment of a new access point at the Site boundary with Gidley Appleby Road and minor signage upgrades at intersections along the haulage route as identified in Section 6.3. A Section 138 permit would be obtained from the relevant road authority/ies for these works.

4.3 State Environmental Planning Policies and Strategies

State Environmental Planning Policies (SEPPs) are Environmental Planning Instruments (EPIs) prepared by the Minister to address issues significant to NSW. The SEPPs outlined in the below sub-sections are relevant considerations for the Proposal.

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

Under the Infrastructure SEPP, Zone RU1 Primary production is a prescribed zone in accordance with Clause 120. This clause defines a resource recovery facility as:

resource recovery facility means a facility for the recovery of resources from waste, including such works or activities as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from waste gases and water treatment, but not including re-manufacture of material or goods or disposal of the material by landfill or incineration.

In addition, a resource recovery facility is defined as a type of waste or resource management facility. Waste or resource management facility means a waste or resource transfer station, a resource recovery facility or a waste disposal facility.

Under Clause 121 of the Infrastructure SEPP:

a) Development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone. Therefore, the Proposal is in accordance with Clause 121 of the Infrastructure SEPP and is permissible with consent.

Clause 104 in conjunction with Schedule 3, of the Infrastructure SEPP identifies resource recovery facilities of any size or capacity as being traffic generating activity under Column 1 of Schedule 3. Accordingly, Council will refer the DA to Roads and Maritime Services.

4.3.2 State Environmental Planning Policy 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) requires the consent authority to consider whether an industrial proposal is a potentially hazardous or offensive industry that without the implementation of appropriate impact minimisation measures would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

Hazardous industry is limited to industrial developments which after all measures proposed to reduce or minimise its impact have been employed, the industry would still pose a significant risk to the surrounding populace and / or biophysical environment.

A preliminary risk screening was completed in accordance with SEPP 33 and Applying SEPP 33 (DoP 2011) and is provided in **Appendix L**. As per the findings of the screening, the quantities of dangerous goods proposed to be stored on-site are well below the screening thresholds and do not trigger the requirement for a Preliminary Hazard Assessment.

The Proposal should not pose any significant risk to the surrounding populace, properties or environment with the implementation of best management practices as well as effective implementation of an Environmental Management System and a Occupational Health and Safety Management System. Section 6.14 addresses hazards in relation to the Proposal.

4.3.3 State Environmental Planning Policy (Rural Lands) 2008

The objects of the Rural Lands SEPP are:

(a) *to facilitate the orderly and economic use and development of rural lands for rural and related purposes,*

(b) *to identify the Rural Planning Principles and the Rural Subdivision Principles so as to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State,*

(c) *to implement measures designed to reduce land use conflicts,*

(d) *to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,*

(e) *to amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.*

The Proposal will provide socioeconomic benefits by converting organic material generated by residents and farmers into a beneficial compost product they can use. This will add value to the local agricultural industry by reducing the need for artificial soil conditioners. The Proposal will involve capital investment in excess of $10 million in the region during construction and full-time employment of six persons during operation.

No subdivision is proposed as part of this DA. Schedule 2 of this State Environmental Planning Policy does not list any land that is considered State significant agricultural land, therefore this Site is not considered to be state significant agricultural

The Rural Lands SEPP has been repealed as of the 28 February 2019 and has been replaced by a new rural planning framework including the *State Environmental Planning Policy (Primary Production and Rural Development) 2019*.

4.3.4 State Environmental Planning Policy (Primary Production and Rural Development) 2019

Clause 11 of the SEPP refers to State significant agricultural land and the provisions relating to the carrying out of development on this land contained in Schedule 1. At the time of lodgement of this EIS, Schedule 1 was blank. Accordingly, this SEPP is not relevant for consideration.

4.3.5 State Environmental Planning Policy No. 55 – Remediation of Land

The objective of SEPP 55 is to provide a consistent planning approach to the remediation of contaminated land in NSW. Under SEPP 55 where rezoning of land or change of use is proposed, it is necessary to establish if the Proposal is to be undertaken on land which has been declared or found to be contaminated.

Consideration of potential for contamination on the Site was assessed in section 6.7.

4.3.6 NSW Waste Avoidance and Resource Recovery Strategy 2014-21

The NSW Waste Avoidance and Resource Recovery Strategy 2014-21 provides targets for the reduction in waste to 2021. The key result areas of the Strategy are to:

1. *Avoid and reduce waste generation.*

2. *Increase recycling.*

3. *Divert more waste from landfill.*

4. *Manage problem wastes better.*

5. *Reduce littering.*

6. *Reduce illegal dumping.*

The Strategy includes objectives and targets to increase recycling of municipal solid waste, and commercial and industrial waste to 70% and to increase the amount of waste diverted from landfill to 75% by 2021-22. The Proposal will assist in the meeting of this target and it is considered the Proposal is consistent with the NSW WARR Strategy as discussed in Section 6.11.

4.4 Local planning framework

4.4.1 Tamworth Local Environmental Plan (LEP)

Local Environmental Plans (LEPs) are Environmental Planning Instruments that guide planning decisions for LGAs and allow Councils to manage the ways in which land is used through zoning and development consents.

The Proposal is located on land zoned as RU1 (Primary Production) under the Tamworth LEP 2010 as shown in Figure 4-1.

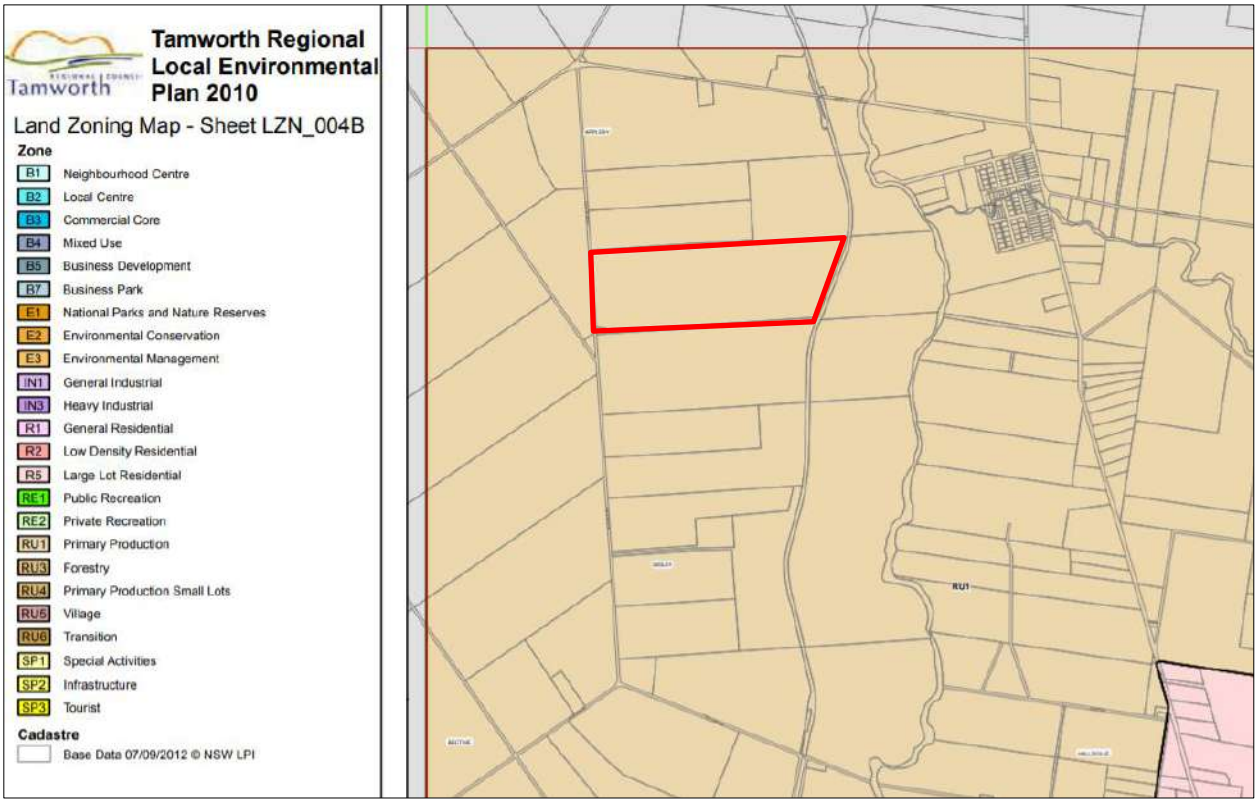

Figure 4-1 Land zoning over the Property (Tamworth LEP maps)

The objectives of this zone are to:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base;

- To encourage diversity in primary industry enterprises and systems appropriate for the area;
- To minimise the fragmentation and alienation of resource lands;
- To minimise conflict between land uses within this zone and land uses within adjoining zones;
- To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production;
- To restrict the establishment of inappropriate traffic generating uses along main road frontages;
- To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry; and
- To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

The use of the Site as a waste management facility or resource recovery facility is permitted within this zone with consent, by virtue of it not being a prohibited use or a use permissible without consent.

Further consideration of the LEP is provided in Table 4-3

Table 4-3 Consideration of the LEP

LEP clause	Comments
Clause 5.10 Heritage Conservation	The Proposal is not likely impact areas with heritage significance. See sections 6.5 and 6.6.
Clause 7.1 Earthworks	Proposed earthworks including site preparation and construction of leachate dam are ancillary to the proposed resource recovery facility (composting). See section 6.7.

The information presented in this EIS addresses the relevant matters of the Tamworth LEP and should enable meaningful consideration of the proposal. The assessment undertaken has been multi-disciplinary and involved consultation with various government agencies, including TRC, and stakeholders. Emphasis has been placed on anticipation and prevention of potential environmental and social impacts, with various management and mitigation measures and monitoring activities proposed to minimise adverse impacts.

4.4.2 Tamworth Development Control Plan 2010

The Tamworth Development Control Plan (DCP) 2010 provides specific guidelines for certain development types and areas in the Tamworth LGA. Consideration of compliance the plan is provided in Table 4-4.

Table 4-4 Compliance with relevant controls in Tamworth Development Control Plan 2010

Theme	Control	Compliant	Section of EIS
Parking	Parking must be provided as per the Schedule in Appendix 1.	Y	Appendix D
	Comply with AS2890.1 Parking Facilities Off Street Car Parking and AS2890.6 Parking Facilities Off Street Parking for People with a Disability	Y	Appendix D
	Manoeuvring areas within the development must be designed to accommodate a B99 vehicle under AS2890.1 Parking Facilities Off Street Parking.	Y	Appendix D

Theme	Control	Compliant	Section of EIS
Land-scaping	Location and grouping of plant types shall be multi-functional providing privacy, security, shading and recreation functions.	Facility is not for public access and is well setback from public roads. See Landscaping plan provided in Appendix D.	Appendix D
	Landscaping/shade structures shall be provided in outdoor car parking areas where >10 spaces required, to provide shading & soften visual impact of large hard surfaces.		
	Landscaping shall comprise low maintenance, drought and frost tolerant species.		
Outdoor Lighting	All developments shall demonstrate compliance with AS4282 Control of Obtrusive Effects of Outdoor Lighting.	Yes	Appendix D
	Sweeping lasers or searchlights or similar high intensity light for outdoor advertising or entertainment, when projected above the horizontal is prohibited.	N/A	N/A
	Illuminated advertising signs should be extinguished outside of operating hours, or 11pm, whichever is earlier.	N/A	N/A
	Where there is potential for light spill to adjoining properties, all illuminated signage shall be fitted with a timer switch to dim or turn off by 11pm each night.	N/A	N/A
Outdoor Advertising / Signage	Signage must comply with SEPP 64 – Advertising and Signage Schedule 1 Assessment Criteria.	N/A	N/A
Environ-mental effects	The application documentation shall identify any potential environmental impacts of the development and demonstrate how they will be mitigated. These impacts may relate to:	A comprehensive environmental assessment has been undertaken and detailed in this EIS	Chapter 6
	o Traffic		
	o Flood liability		
	o Slope		
	o Construction impacts		
	o Solid and Liquid Waste		
	o Air quality (odour and pollution)		
	o Noise emissions		
	o Water quality		
	o Sustainability		
Soil and Erosion Control	Runoff shall be managed to prevent land degradation including offsite sedimentation.	A comprehensive environmental assessment has been undertaken and detailed in this EIS	Section 6.8 Appendix D
	Reference shall be made to the NSW Governments *Managing urban stormwater: soils and construction, Volume 1* (available from Landcom) - "The Blue Book".		
	Cut and fill will be minimised and the site stabilised during and after construction. Arrangements in place to prompt revegetation of earthworks to minimise erosion.		
Vegetation	Development design shall accommodate retention of any significant trees and vegetation.	Yes	Section 6.4 Appendix H

Theme	Control	Compliant	Section of EIS
Waste Mgmt	General waste storage and collection arrangements shall be specified.	Yes	Section 6.11
Noise	Where relevant, applications are to contain information about likely noise generation and the method of mitigation.	Yes	Section 6.2
Geology	The design process must give consideration to the potential impact of erosive soils, saline soils, soils of low wet strength, highly reactive soils and steep slopes and document how these constraints are addressed.	Yes	Section 6.7

4.5 Summary of Licences and Approvals Required

The following licences and approvals will be required for the proposal:

- DA under the EP& A, 1979
- EPL under the POEO Act 1997;
- Approval under Section 68 of the Local Government Act 1993 for sewerage works;
- Approval under the Water Management Act 2000; and
- Section 138 approval of *Roads Act 1993*

5. Community and Stakeholder Consultation

5.1 Overview

This chapter outlines the consultation undertaken in respect to the Proposal, and includes a summary of the community, stakeholder, agency and Aboriginal community consultation that has been undertaken to date.

5.1.1 Consultation Objectives

A Stakeholder and Community Engagement Plan was prepared for the Proposal. The principal objectives and requirements of the consultation plan are to:

- Identify and engage with stakeholders to notify them of the Proposal, the approvals process, and the means by which they can engage with TRC;
- Provide stakeholders with consistent and accurate information regarding the Proposal;
- Consult with nearby communities to raise awareness of the proposal, especially those who may potentially be affected by the Proposal;
- Implement a system to effectively record, consider manage and respond to stakeholder feedback;
- Understand and address community concerns through consultation and the EIS process; and
- Anticipate any issues and communicate these to stakeholders as early as possible.

5.2 Community Consultation

TRC has undertaken consultation with potentially impacted receivers, surrounding residents and the wider Tamworth community as outlined in Table 5-1.

Table 5-1 TRC Consultation and Key Issues

Stakeholder	Consultation Types	Messages, key Issues and Concerns
Gidley Landholders and Residents situated within 2km of the proposed Site along: Gidley Appleby Road, Gidley Siding Road, Appleby Lane, Manilla Road and Oxley Highway	Letter 1 - Proposed Organic Recycling Facility. 29 May 2019.	• Letter advising of the proposed Site for the ORF to be 284 Gidley Appleby Road; • Identification of DA process and determining Authority (i.e. completion of EIS, submission of DA, Public Exhibition phase and JRPP to consider determination); • Highlight that this will be the start of an ongoing conversation throughout the process; • How to get gurther information - calling the Proposal contact and / or viewing the Your Voice Website; and • Confirmation of intent to hold a Community Information Session in July.
Tamworth Community	Media Release 29 May 2019	• Announcement of purchase of property for the proposed ORF at 284 Gidley Appleby Road; • Establishment of an ORF will support the implementation of the Region's first FOGO kerbside collection system to divert organic materials from landfill; • Expected cost of the ORF is $15.2 million with $3 million secured in Grant Funding; • Proposal supported by the NSW EPA and Environmental Trust as part of the EPA's Waste Less, Recycle more initiative;

Stakeholder	Consultation Types	Messages, key Issues and Concerns
		• ORF Design to receive and process up to 35,000tpa of organic materials; and • Technology proposed for the composting process will be an enclosed TCS with an enclosed Receival Shed.
Tamworth Community	Website / Online 29 May 2019 Ongoing	• Proposal Summary, updates and a Question Portal. https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility
Gidley Landholders and Residents situated within 2km of the proposed Site along: Gidley Appleby Road, Gidley Siding Road, Appleby Lane, Manilla Road and Oxley Highway	Letter 2 - Notification of Community Information Session 6 June 2019	• Benefits to our Community for the establishment of an ORF in the Region; • Invitation to neighbouring property owners to obtain more information, provide feedback and / or arrange a one on one meeting; • Invitation to attend the Community Information Session at scheduled date and time in July; and • Identification of DA process and determining Authority (i.e. completion of EIS, submission of DA, Public Exhibition phase and JRPP to consider determination; and • How to get F=further information - calling the Proposal contact and / or viewing the Your Voice Website.
Gidley Landholders and Residents	Face to Face, On-Site Meeting 19 June 2019	• Meeting with nearest neighbours and interested parties; • TRC Project Team provided a summary of the Proposal, identified the chosen technology and why, selection of the proposal Site, Identification of DA process and determining Authority, completion of EIS, submission of DA, Public Exhibition phase and JRPP to consider determination; • Confirmation that determining Authority is the JRPP not TRC and who the JRPP are - independent merit-based panel, assessment of Designated or Regionally Significant Developments; • Highlighted Concerns from interested parties included: Water Management (Surface, Groundwater, Leachate), Odour generation, Air Quality (dust generation), Traffic Access to and from Site, Hours of Operation; Biosecurity and impacts to farms; devaluation to properties, concerns that this will be Tamworth's next Landfill Site; Zoning of Land and confusion surrounding - "Classification of Land" and "Re-Zoning of Land"; concerns that State Government has provided funding so they may 'approve the ORF anyway', potential for contamination to migrate off-site; • Confirmation that site would require an EPL, monitored and enforced by the NSW EPA - EPA have powers to ensure that operational requirements are met and may fine parties that do not comply with the operating licence conditions; • Confirmation that Community Information Session will be held at venue, date and time; and • Further information can be obtained by calling the Project contact and / or viewing the Your Voice Website.
Tamworth Community	Advertisement of Community Information Session in Northern Daily Leader Newspaper 6 July 2019 13 July 2019	• Notification details of ORF proposal and upcoming Community Information Session; • Invitation for all interested Community members to attend at specified venue, date and time; and • Further information can be obtained by calling the Project contact and / or viewing the Your Voice Website.

Stakeholder	Consultation Types	Messages, key Issues and Concerns
Tamworth Community, Gidley Landholders and Residents	Face to Face, Community Information Session - Public Meeting 18 July 2019	• Presentation on proposed ORF and focus on design of the Facility and mitigation measures to address potential issues of concern; • Overview of Planning Process and current status of proposal; • Question and Answer time, identification of topics of concern - Odour, Traffic Impacts and Access, Water Management, Leachate contamination of Groundwater Sources, Biosecurity, effectiveness of proposed technologies, identification of existing operating facilities; • Provision of Frequently Asked Questions Information Sheet; and • Further information can be obtained by calling the Project contact and / or viewing the Your Voice Website.
Attendees of Community Information Session	Emailed Letter and Summary Report 1 August 2019	• Concerns identified and have been noted, which include: Water Management, Traffic Impacts and Access, Biosecurity, Air Quality and Odour; • Confirmation of delay of lodgement of DA until September 2019 to allow for a full review of feedback provided on the night and to conduct further assessments; • Supply of list of operating sites, utilising a TCS, confirmation from the NSW Environmental Trust; • Summary Report of Community Information Session and Question and Answers from the night; and • Further information can be obtained by calling the Project contact and / or viewing the Your Voice Website.
Tamworth Community, Gidley Landholders and Residents	Phone calls and emails 29 May 2019 Ongoing	• Inquiries requesting more information on the proposed technology, benefits of the type of technology, design components for mitigation measures, processing capacity, volumes of organic materials diverted from landfill; • Resident specific concerns: traffic access and impacts to properties, devaluation to properties, odour, dust, biosecurity, water management and contamination of water sources / flow on impacts to properties, land zoning permissibility, Site becoming the next 'landfill', acceptance of type of materials, any potential attraction for birds; import of materials from outside the Tamworth LGA; • Potential for lease of area not utilised by the ORF as farming / grazing; and • Discussion of alternative technologies and have these been considered.

5.3 Stakeholder Consultation

A Preliminary Environmental Assessment (PEA) was submitted to DPIE and subsequently provided to relevant agencies to provide feedback for the preparation of the SEARs. DPIE considered this feedback and issued the SEARs to TRC on 30th May 2019. Agencies that provided a response to DPIE included:

- NSW Environment Protection Authority (EPA);
- NSW Office of Environment & Heritage (OEH);
- Natural Resources Access Regulator (NRAR);
- NSW Department of Primary Industries (DPI); and
- Transport for NSW - Roads and Maritime Services.

DPIE used these responses to provide the SEARs issued to TRC which are provided in **Appendix A**.

Following receipt of the SEARs, a Planning Focus Meeting was held with key government agencies in accordance with the SEARs. Invitations were extended to the following agencies:

- TRC – various departments;
- EPA;
- OEH;
- NRAR;
- DPI;
- Roads and Maritime Services; and
- NSW Health.

A summary of the issues raised during the planning focus meeting by the agencies that attended is outlined in Table 5-2. These have been addressed within Chapter 6 of this EIS.

Table 5-2 Key Issues raised at Planning Focus Meeting

Stakeholder	Key Issues	Response
EPA	1. Noise a. How many trucks are expected during the AM peak? 2. EPA requested the following be addressed in the EIS as per the SEARs a. Odour b. Water c. Compliance with Resource Recovery Orders and exemptions for waste d. Receival of waste and waste products e. Confirmation that the dams have capacity during storm events f. Specific emergency details g. Preference for reuse of leachate on-site h. Requirement that surfaces for receival of material are impermeable i. Drains have been designed in accordance with the guidelines j. Operational practices for emergencies.	The issues raised by the EPA have been addressed throughout this EIS within the various sections of Chapter 6. Noise associated with traffic movements is outlined in Section 6.2. Odour is addressed in Section 6.1. Water is addressed in Section 6.7. Compliance with RRO and waste exemptions is covered in 4.2.3 and 6.11. Receival of organic material streams is outlined in Chapter 3. Water and wastewater storage capacity is addressed in the Water Balance in **Appendix N**. Reuse of leachate on-site is addressed in Section 6.10. Pavement types are outlined in **Appendix D** and Chapter 3. Drainage on site is addressed in **Appendix D** and Section 6.7. Operational emergencies will be addressed in the OEMP prepared in

Stakeholder	Key Issues	Response
		accordance with the mitigation measures contained in Chapter 7.
Tamworth Regional Council – Strategic Planning	1. Plane movements a. Engagement with airport to discuss any potential concerns. b. Will the facility be visible from the plane? Does this cause any potential issues with glare? c. Are there biosecurity or bird strike risk? 2. Hours of operation a. Operations outside of standard business hours? b. Will the noise from beeping trucks be an impact to residents? 3. Fire safety a. Risk of explosions and fire in the FOGO and/or compost b. Firefighting – procedures 4. Property a. TRC will investigate lot size b. There could be more receptors in the future as the surrounding lot sizes could be increased (sub divide) within 100m 5. Utilities a. Alternate power b. Check capacity of power 6. Address in the EIS a. Biodiversity b. Indigenous heritage	Airport and aviation risks have been discussed directly through correspondence with CASA and Tamworth Airport and are summarised in Section 6.14. Hours of operation are outlined in Chapter 3. Fire safety is addressed in Section 6.13 and 6.14 as well as **Appendix D**. Property including land use and permissibility are addressed in section 2.4.1 and 4.4.1 respectively. Utilities have been addressed during development of the preliminary engineering design presented in **Appendix D**. Biodiversity is addressed in Section 6.4 and Aboriginal Heritage in Section 6.5.
Roads and Maritime Services	Suitability of the intersection of Manilla Road and Appleby Lane	Assessment of the haulage route is presented in Section 6.3.
DPI	1. Recommended engagement a) Engage early b) Bio aerosol risk c) Constantly engage with ProTen throughout the process. 2. Address Bio aerosols 3. Address pasteurisation in high focus a) Focus on biosecurity and weeds b) Kill pathogens, weeds (kill before maturation rows) and 1-2 stages (14 days). c) Initial pathogen levels monitor before and after 4. Rural land SEPP a) Risk assessment of likelihood of subdivision (agricultural and residential) i) Need a buffer area? 50m?	Community consultation is addressed in this Chapter. Bioaerosol risk is addressed in Section 6.14 and **Appendix L**. ProTen engagement was undertaken as outlined in this Chapter. The pasteurisation process is outlined in Chapter 3 and **Appendix D**. The Rural Lands SEPP is addressed in Chapter 4.

Stakeholder	Key Issues	Response
	5. Assess the Site as circle rather than a rectangle when considering off site impacts	Where applicable assessments have considered a radius of impact.

Consultation was also undertaken with the Civil Aviation Safety Authority (CASA), Tamworth Regional Airport and the NSW Rural Fire Services. Copies of the correspondence is provided in **Appendix C**.

Meetings were also held with ProTen, the neighbouring commercial property.

Further consultation regarding clarification of the SEARs was undertaken with OEH with respect to flooding and aboriginal heritage due diligence assessment. A copy of the correspondence is provided in **Appendix C**.

5.4 Stakeholder and Community Consultation

The Stakeholder and Community Engagement Plan identified key community stakeholders based on:

- Proximity to the Site and haulage routes;
- Potential for views of the Proposal; and
- Potential to be impacted by amenity aspects e.g. odour / noise.

It was also identified that the local community in Tamworth would have an interest in the proposal.

The key community stakeholders were identified as:

- Residents within a 2km radius of the Site;
- Businesses adjacent the Site including the neighbouring ProTen Poultry Farm;
- Road users and residents along the primary haulage routes;
- Tamworth community; and
- Tamworth Local Aboriginal Land Council (TLALC).

5.4.1 Consultation with residents and businesses in proximity to Site

Consultation with residents and businesses in proximity to the Site was undertaken by TRC including:

- Notification letter distributed by mail to residents within 2km of the Site (May 2019). A copy of this letter is provided in **Appendix C**;
- Notification letter distributed by mail to residents within 2km of the Site (June 2019) notifying them of the upcoming Community Information Session.
- Community Information Session held at the Tamworth Community Centre (July 2019);
- Follow up Letter and Summary Report provided via email to Attendees of the Community Information Session (August 2019); and
- Council Your Voice Website (https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility).

5.4.2 Consultation with the Local Community

Consultation with the local community to capture road users and residents along the primary haulage routes and the wider Tamworth community was undertaken including:

- Media release sent to local and regional media;
- Media release published on TRC website;
- Public notice in the Northern Daily Leader; and
- Community Information Session and follow up letter.

This consultation was undertaken to inform the community of the Proposal and provide opportunities to provide feedback and discuss the Proposal with the TRC Waste Management team.

5.4.3 Key Concerns raised by the Community

The community raised a number of concerns with TRC during the above community consultation activities. A summary is provided in Table 5-3. **Appendix C** also contains a summary of the Q&A session at the Public Information Session.

Table 5-3 Key Community Concerns

Key Concern	Response	Reference to where it is addressed within the EIS
Similar facilities / technology currently in operation within NSW	A follow up letter was sent to attendees which included a list of similar facilities.	The options and alternatives to manage organic material within the Tamworth LGA has been outlined in Section 1.9..
Pasteurisation Process – how are bones broken down	Materials are screened, shredded and mixed before being loaded into the tunnels for pasteurisation, which facilitates the breakdown of bones.	A summary of the operation of the facility is provided in Section 3.6.
How has odour testing been conducted and what is the compliant odour level at this Site Potential for odour impacts associated with turning stockpiles on the maturation pads. How will residents be compensated for odour impacts. Feasibility of having the maturation pads indoors.	CALPUFF Modelling System and The Air Pollution Model was used by Todoroski Air Sciences in their odour impact assessment. Investigation based on Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC 2005). The assessment found the proposed development is unlikely to lead to nuisance or offensive odour beyond the site. Turning of windrows during poor dispersion conditions will be avoided where possible (e.g. undertake pile turning during the day and not early in the morning or late in the evening when temperature inversions could occur). The mitigation measures outlined for management of odour will ensure compliance with conditions around odour management.	An Air Quality Impact Assessment was undertaken and provided in **Appendix E**. A summary of the impacts is outlined in Section 6.1.

Key Concern	Response	Reference to where it is addressed within the EIS
	The size and operation of the maturation pad is not feasible to be undertaken indoors.	
Potential for contamination of soil and groundwater from stockpiles on the maturation pad	The maturation pads and the leachate dam will be prepared to prevent leachate permeating into ground (lining and compaction). There is unlikely to be impacts upon soil and groundwater.	An assessment of the potential impacts upon soils and groundwater is outlined in Section 6.7 and 6.8 respectively.
Request for testing of surrounding groundwater used by neighbours to establish a baseline.	TRC will develop a program for ground water analysis over the next 12 months before testing commences. This will create a data baseline. A sampling program will be implemented prior to construction, at the completion of construction and through the first 12 months once Operational.	A groundwater impact assessment is provided in Section 6.9
Potential for contamination of surface water and impacting on flora and fauna in the Peel River.	The assessment has concluded if mitigation measures are adapted the risk of surface water contamination is minimal.	An assessment of the potential impacts upon surface water is outlined in Section 6.8
Biosecurity concerns including duration of time in the tunnels. What buffer is required from the adjacent poultry farm?	The material received will be processed for approximately 10-12 weeks including 28 days pasteurisation within the TCS. During the first 14 days composting process, the material will be pasteurised at around 55-65 ºC to destroy pathogens and denature weed seeds. Buffer distances for to reduce potential for bioaerosol risks have been identified and will be complied with.	An assessment of biosecurity risks is outlined in Section 6.14. and **Appendix L**.
Water demands of the facility during operation.	A Water Balance has been undertaken for the Site/Proposal and identified that sufficient water sources are available to meet the operational demands of the facility.	Details of the water demands of the facility are outlined within Section 3.6. Furthermore, these are assessed within the Water Balance provided in **Appendix N**.
Identification and assessment of Aboriginal heritage including consultation with the LALC.	The proposed works will not impact any known sites. The Site is highly disturbed and a lack of archaeologically sensitive landscape features indicate there is low	An Aboriginal Heritage Due Diligence Assessment has been undertaken and is provided in **Appendix I**. A summary of this assessment is provided in Section 6.5. Consultation undertaken

Key Concern	Response	Reference to where it is addressed within the EIS
	potential for an intact subsurface archaeological deposit. A TLALC representative attended a survey and a copy of the Aboriginal Heritage Due Diligence Assessment was provided to the TLALC.	with the LALC is outlined in Section 5.4.4.
Increase in traffic and the number of heavy vehicles on the surrounding roads. The proposed access point would result in amenity impacts on adjacent residents. Could it be positioned further to the northern boundary.	The proposed haulage routes are approved B-double routes and the increased traffic can access the Site safely in accordance with AUSTROADS Guidelines. The increase in movements would be distributed across three primary haulage routes thus minimising the impact on anyone receiver.	A Traffic Impact Assessment has been undertaken and is provided in **Appendix G**. A summary is provided in Section 6.3.
What was the Site Selection process?	A detailed site selection process was undertaken to ensure the site selected met a number of minimum criteria.	The options and alternatives to manage organic material within the Tamworth LGA has been outlined in Section 1.9. This includes a summary of the site selection process.
Dust generated from the stockpiles during strong winds	It is unlikely that dust will be generated from the stockpiles during strong winds due to their moisture content. Mitigation measures have been outlined to ensure dust is minimised at all times during operation of the facility.	An Air Quality Impact Assessment was undertaken and provided in **Appendix E**. A summary of the impacts is outlined in Section 6.1.
Is the Proposal permissible on land zoned RU1?	The Proposal is permissible of land zoned RU1.	Consideration of the permissibility of the Proposal is outlined in Section 4.
Land Use should the Proposal not be approved	TRC and Councillor's would review land use at this time	. See **Appendix C**.
JRPP Process	TRC provided a summary during the public information session as to the JRPP process. The JRPP may undertake a Site visit when determining the DA.	See **Appendix C**.
Government Agency & Councillor Site Visits	A Planning Focus Meeting was held in July 2019 which included a Site visit by attending government agencies. The	See section 5.3 above.

Key Concern	Response	Reference to where it is addressed within the EIS
	NSW EPA had representatives in attendance. No Councillors have visited the Site.	
Kerbside collection changes & Property Acquisition process.	TRC responded to these concerns at the Public Information Session. These are addressed further within the EIS. See	See **Appendix C**.

5.4.4 Consultation with the Aboriginal Community

Ecological Australia (ELA) consulted with the TLALC in relation to the Proposal including participation in a survey of the Site on Friday 23rd August 2019.

The TLALC representative that attended the survey identified three artefacts on the eastern section of the Site near the existing drainage lines. Further information is outlined in the Aboriginal Heritage Due Diligence Assessment (**Appendix I**).

A copy of the Aboriginal Heritage Due Diligence Assessment was provided to the TLALC by ELA.

6. Environmental Assessment

This chapter introduces and describes the key environmental risks and provides an assessment of these risks. Each potential environmental impact was systematically reviewed with reference to:

- The scope of the Proposal
- The SEARs issued by DPIE
- Specialist reports
- Other relevant documentation including policies, guidelines, and more, and
- Consultation with relevant government agencies and neighbouring landowners

6.1 Air Quality and Odour

6.1.1 Introduction

An Air Quality Impact Assessment (AQIA) was prepared by Todoroski Air Sciences (2019) to assess the potential air quality and odour impacts associated with the construction and operation of the Proposal (**Appendix E**).

The AQIA was prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2017) using a methodology based on a Level 2 / 3 Odour Impact Assessment as described in the *Technical Framework – Assessment and Management of Odour from Stationary Sources in NSW* (NSW DEC 2006).

The AQIA comprises:

- A background to the Proposal and description of the proposed Site and operations;
- A review of the existing meteorological and air quality environment surrounding the Site;
- A description of the dispersion modelling approach and emission estimation used to assess potential air quality impacts; and
- Presentation of the predicted results and discussion of the potential air quality impacts and associated mitigation and management measures.

A summary of the AQIA is provided below.

6.1.2 Existing Environment

The land use surrounding the Site includes a number of poultry broiler operations, agriculture and rural residential receivers. The receiver locations assessed as part of the air quality assessment are outlined in Figure 6-1**.** Two properties (R6 and R7) located to the north east of the Site are within the ProTen poultry farm property but are considered as residential receivers for the purposes of the assessment,

The topography in the general vicinity of the Proposal area can be characterised as being relatively flat with a gentle depression to the east of the Site where the north flowing Peel River is located. The Proposal is located on a slightly elevated ridge, which would assist with the dispersion of emissions. A topographical map of the area is included in Figure 6-2.

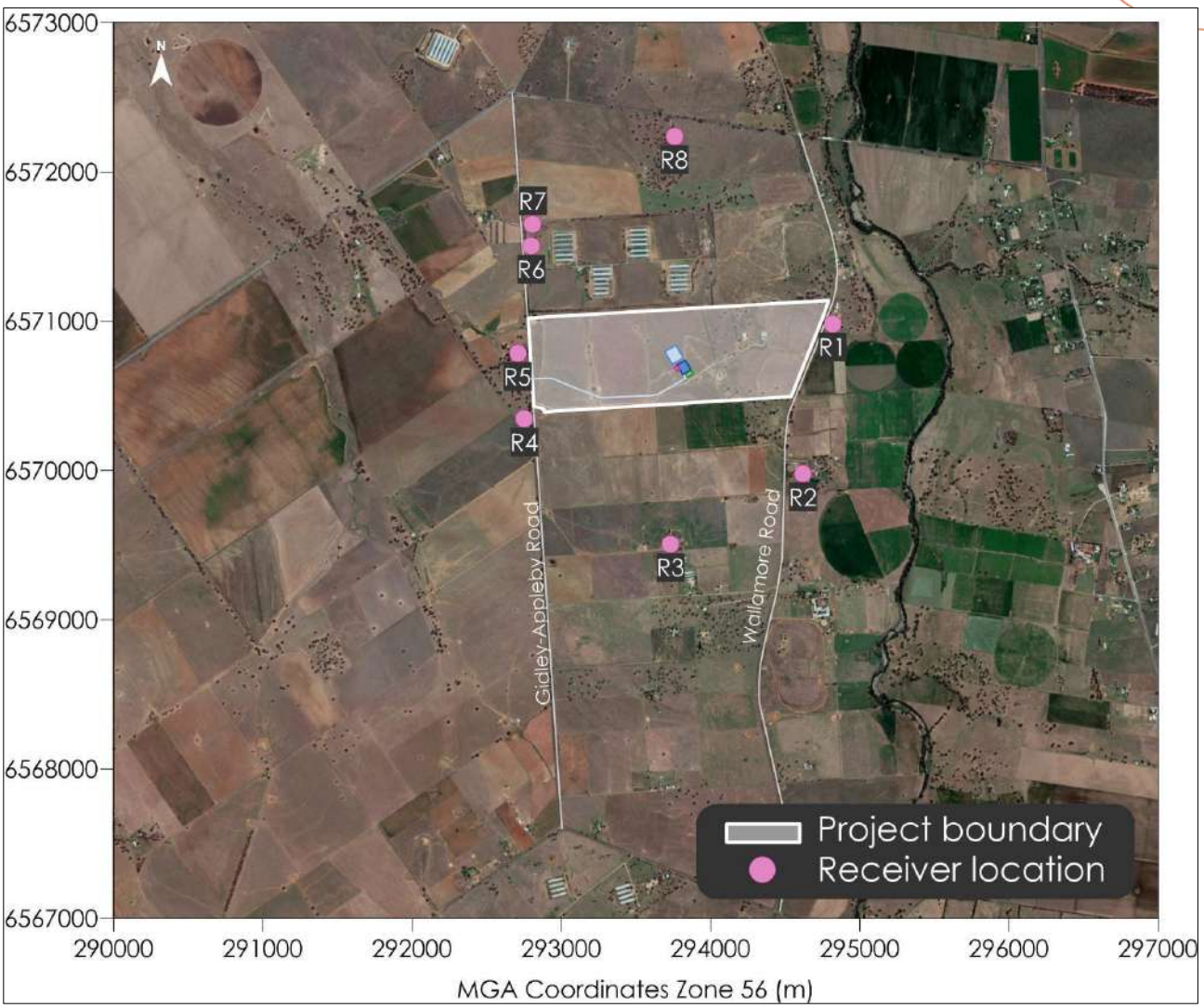

Figure 6-1 Location of sensitive receivers assessed in the air quality assessment (Source: Todoroski Air Sciences Tamworth Air Quality Impact Assessment 2019)

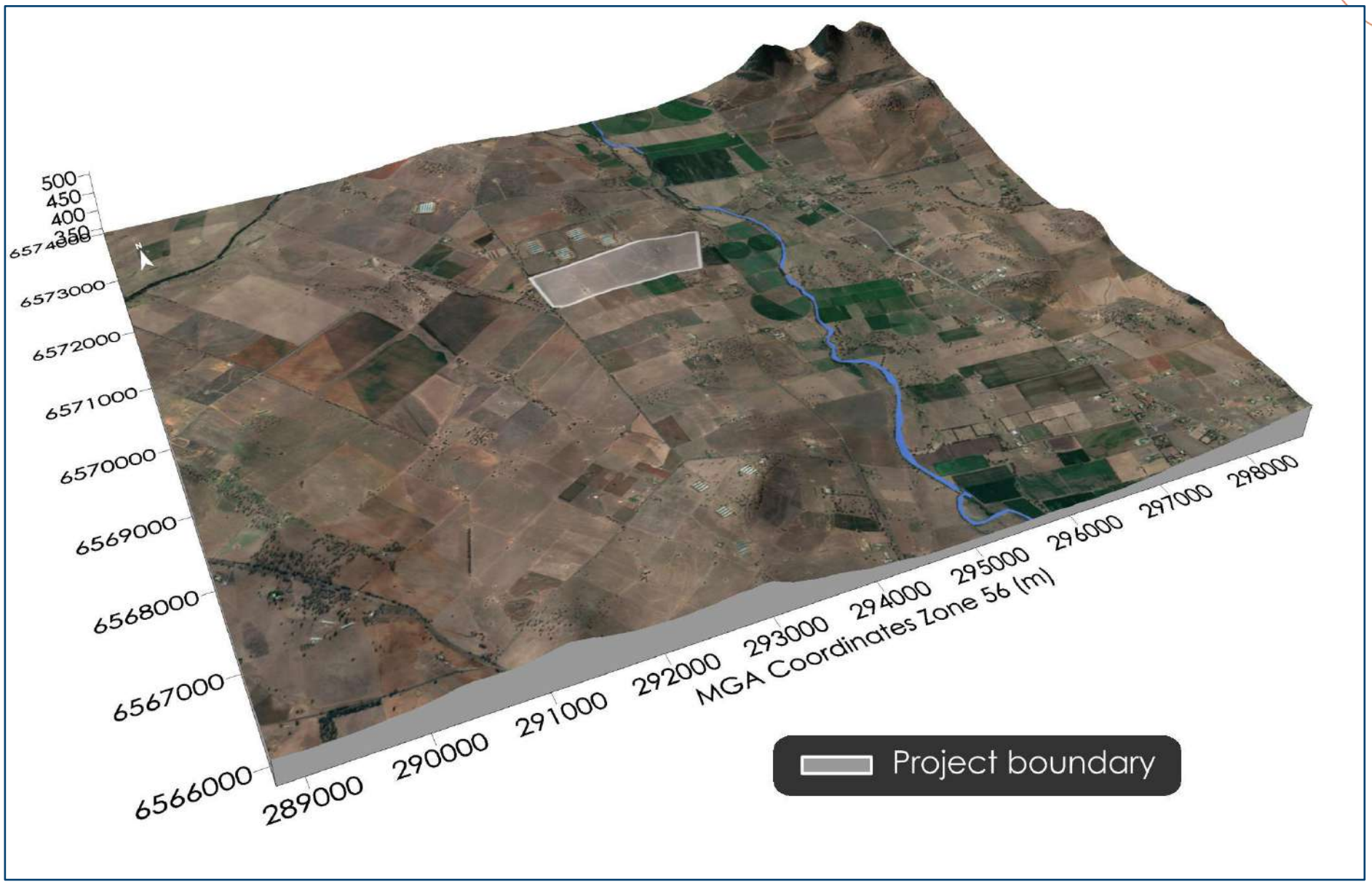

Figure 6-2 Topography of the Proposal location (Source: Todoroski Air Sciences Tamworth Air Quality Impact Assessment 2019))

Local climatic conditions

Long-term climatic data from the Bureau of Meteorology (BoM) weather station at Tamworth Airport Automatic Weather Station (AWS) (Site No. 055325) have been used to characterise the local climate in the proximity of the Proposal. The Tamworth Airport AWS is located approximately 10km south of the Proposal (see Figure 6-1). Detailed climatic data is provided in the **Appendix E** and described in Section 2.4.5.

Local meteorological conditions

On an annual basis, winds typically occur along a southeast to northwest axis with the highest portion of winds from the southeast and south-southeast.

Annual and seasonal windroses for the Tamworth Regional Airport AWS during the 2014 calendar period were used for assessing air quality impacts and are presented in **Appendix E**.

Local air quality

The main sources of particulate matter emissions in the area surrounding the site include emissions from motor vehicle exhaust, wood heater emissions and the existing poultry farm. The main sources of odour in the area surrounding the Site include emissions from the poultry farm and agriculture.

Air quality monitoring data was retrieved from a PM_{10} Tapered Element Oscillating Microbalance (TEOM), operated by the NSW Office of Environment and Heritage (OEH) located in Tamworth (approximately 10km southeast from the Site).

Table 6-1 presents a summary of the PM_{10} concentrations for the Tamworth monitoring station from 2013 to 2017. The data indicates that for PM_{10}, annual average levels were below the relevant EPA criterion (NSW DEC 2005) of 30µg/m³ and measured dust levels on a 24-hour average basis are on occasion above the 24-hour average criterion of 50µg/m^3.

Table 6-1 Summary of PM levels from Tamworth

Year	Annual average (µg/m³)	Maximum level (µg/m³)	No. of days above 50µg/m³ criterion
2013	16.6	47.5	0
2014	15.8	66.6	1
2015	14.1	52.7	1
2016	15.3	51.7	1
2017	15.3	54.1	2

µg/m³ = micrograms per cubic metre

6.1.3 Impact Assessment

Best practice odour and air quality management during planning stages is to group potential offensive industries together. Siting adjacent to existing potential offensive industries has the potential to minimise the net land area impacted by odour, relative to the same industries spread apart, however it is important to ensure that there is an adequate buffer distance to residential receivers. This assessment is outlined below for both the construction and operational stages of the Proposal.

Construction

The establishment and construction of related infrastructure associated with the Proposal has the potential to generate dust emissions. Potential construction dust emissions will primarily be generated due to material handling, vehicle movements and windblown dust generated from exposed areas. Particulate emissions would also be generated from the exhaust of construction vehicles and plant.

The potential air quality impacts due to these activities are difficult to accurately quantify on any given day due to the short sporadic periods of dust generating activity, which may occur over the construction time frame. The sources of dust are temporary in nature and will only occur during the construction period.

The total amount of dust generated from the construction process is unlikely to be significant given the nature of the activities proposed. As these activities, would occur for a limited period, no significant or prolonged effect at any off-site receiver is predicted.

Operations (Particulate Matter)

Table 6-2 summarises the air quality goals that are relevant to this Proposal as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW EPA 2017).*

The air quality goals for total impacts relate to the total dust burden in the air and not just the dust from the Proposal. Consideration of background dust levels needs to be made when using these goals to assess potential impacts.

Table 6-2 NSW EPA air quality impact assessment criteria (Source: NSW EPA, 2017)

Pollutant	Averaging period	Impact	Criteria
TSP	Annual	Total	90µg/m³
PM_{10}	Annual	Total	30µg/m³
	24 hours	Total	50µg/m³
Deposited dust	Annual	Incremental	2g/m²/month
		Total	4g/m²/month

µg/m³ = micrograms per cubic metre, g/m²/month = grams per square metre per month

The organic materials accepted at the Proposed ORF will range in moisture content thus minimising the potential for dust generation. The access road and process areas including the maturation pads will be sealed as outlined in **Appendix D**.

The stockpiled compost in the maturation pad will be managed to minimise dust generation during turning and dispatch though temperature and moisture control.

Dust emission estimates for the Proposal have been calculated by analysing the various types of dust generating activities taking place and utilising suitable emission factors sourced from US EPA developed documentation (US EPA, 1985 and Updates). The estimated dust emissions for activities associated with the Proposal are presented in Table 6-3.

Table 6-3 Estimated annual TSP emissions rate for the Proposal (Source: Tamworth AQIA Report – Todoroski 2019)

Activity	TSP emission (kg/year)	PM_{10} emission	$PM_{2.5}$ emission
Delivering material on-site	18,419	4,694	469
Unloading material to stockpile within building	55	26	4
Loading material to shredder	55	26	4
Sorting/ Screening	625	215	47
Unloading material to stockpile	55	26	4
Loading to tunnels	55	26	4
Rehandle material	11	5	1
Loading maturation area	50	24	4
Sorting/ Screening	563	194	42
Loading product to truck for dispatch	50	24	4

Activity	TSP emission (kg/year)	PM_{10} emission	$PM_{2.5}$ emission
Delivering material off-site	9,498	2,421	242
Wind erosion (maturation area)	425	213	32
Diesel exhaust	37	37	35
Total TSP emissions	**29,898**	**7,929**	**892**

Table 6-4 presents the predicted particulate dispersion modelling results at each of the assessed sensitive receiver locations. The results show minimal incremental effects would arise at the sensitive receiver locations due to the Proposal.

Table 6-4: Particulate dispersion modelling results for sensitive receivers – Incremental Impact

Receiver ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/month)
	Incremental impact					
	24-hour average	Annual average	24-hour average	Annual average	Annual average	Annual average
	25	-	50	-	-	2
R1	0.2	<0.1	1.4	0.1	0.2	<0.1
R2	0.2	<0.1	2.0	0.2	0.4	<0.1
R3	0.2	<0.1	1.7	0.2	0.4	<0.1
R4	0.5	0.1	4.8	0.5	1.5	0.1
R5	0.5	0.1	4.6	0.8	2.4	0.1
R6	0.2	<0.1	2.3	0.3	0.8	<0.1
R7	0.2	<0.1	2.1	0.2	0.6	<0.1
R8	0.1	<0.1	0.9	0.1	0.1	<0.1

The low incremental predictions presented in Table 6-4, when considered with the potential background air quality levels shown in Table 6-3 **i**ndicate that significant cumulative dust impacts are unlikely to occur at any sensitive receiver location.

The predicted dust levels associated with the Proposal would be well below the applicable impact assessment criteria for the assessed dust metrics. It is further noted that the modelling is highly conservative, as the organic materials delivered to Site and matured on the maturation pad would commonly be moist and not a significant source of dust.

Sealing of the entry to the Site and access roads in accordance with **Appendix D** will also reduce any potential dust generated during operation of the proposed facility.

Operations (Odour)

To predict the likely odour impact that may arise from the Proposal, air dispersion modelling was used to calculate the level of dilution of odours emitted from the source at the point that such odour reaches surrounding sensitive receivers.

The assessment criteria relevant to the Proposal are adopted from the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC 2005).*

Emissions Estimation

Odour emissions from the Proposal would potentially arise from a range of sources with varying rates of odour emissions at different times due to the operational activities conducted. The main sources of odour emissions from the Proposal

are from the biofilter, and fugitive emissions from the processing of the input material streams and other sources such as the storage of material and compost handling activities.

The purpose built biofilter would be designed to achieve odour removal with efficiencies of more than 90%. The total exhaust air volume into the biofilter would be a maximum 42,000m³/hr with surface emissions not exceeding the equivalent of 500 OU/m³ and cover an area of approximately 420m². The closest sensitive receiver is located over 800m from the ORF.

Even though the main building would be fully enclosed and air controlled, there is still potential for some fugitive odour emissions to escape at times when the doors are opened for access into the building. To estimate the potential fugitive odour emissions, the different processes occurring in the main building were considered which included stockpiling of organic material received, stockpiling of shredded material and shredding of material.

The estimated odour emissions rates (OER) and specific dour emission rates (SOER) from each of these sources are outlined in Table 6-5 with source dimensions based on approximate areas from the main building plans. It has been assumed a nominal 15% leakage would occur from the building entry when a door may be open.

Table 6-5 Summary of odour emission rates for main building sources

Source description	Source dimensions (m²)	SOER (OUV/m²/s)	OER (OU/s)
Stockpiling of organic material received	278	3.96	1,101
Stockpiling of shredded material	556	4.26	2,367
Shredding of material	-	-	5,741
Total	-	-	9,209

Source: Todoroski & Cowan (2015) and ERM (2013)

The other potential sources of odour emissions from the Proposal are:

- The screen located in the product storage and decontamination area (located inside the shed);
- The leachate dam; and,
- The wheel loader / excavator operating on-site.

A summary of the modelled odour emission rates from the above sources applied in the dispersion modelling is presented in **Table 6-6**.

Table 6-6: Summary of odour emission rates for other Proposal sources

Source description	Source dimensions (m²)	SOER (OUV/m²/s)	OER (OU/s)
Screen	-	-	4,960
Leachate dam	13,500	0.33	4,455
Wheel loader / excavator	5	5.34	26.7

Source: Todoroski & Cowan (2015) and GHD (2012)

To estimate potential odour emissions associated with the maturation and product storage area, a review of odour emission measurement data for composting material at different stages was collated from various studies and is summarised in Table 6-7.

Table 6-7 Summary of odour measurement data for composting operations (OUV/m²/s)

Week	Site/ sample 1[(1)]	Site/ sample 2[(1)]	Site/ sample 3[(1)]	Site/ sample 4[(1)]	Site/ sample 5[(2)]	Site/ sample 6[(2)]	Site/ sample 7[(3)]	Site/ sample 8[(4)]
0	7.7	-	0.32	0.27	-	-	5.92	-
1	1.1	-	0.1	0.25	3.35	2.709	-	1.95
2	0.36	-	0.15	0.36	3.916	-	-	1.12
3	0.85	-	-	0.042	0.416	0.202	-	0.97
4	0.07	-	0.18	0.023	0.408	0.125	-	0.89
5	2	-	0.14	0.11	2.28	1.66	0.51	-
6	0.29	-	-	0.1	0.58	0.74	-	-
7	-	0.4	-	0.065	1.7	2.07	-	-
8	-	0.8	-	-	-	-	-	-
9	-	-	-	-	-	-	0.94	-

[(1)] ERM (201) [(2)] Todoroski & Cowan (2015) [(3)] TOU (2010) [(4)] GHD (2015)

The tunnel composting process would occur over 28 days followed by the maturation stage. To conservatively estimate the potential odour emissions for the maturation and product storage, the average of the maximum measured odour level for week 5 onwards (1.4OUV/m²/s) was considered.

Other surrounding odour sources

Three poultry farms located approximately 0.5km, 2km and 3km respectively to the north, north-northwest and south of the Proposal, have the potential to emit adverse odour emissions in the vicinity of the Proposal. Broiler poultry farms generally receive one day old chickens and raise them for five to eight weeks, depending on required outcomes, for the purposes of meat production (ERM 2012).

We note that the character of the odours from these poultry farms would be relatively different (to very distinctly different) to those emitted from the Proposal. The expectation is that the receiver would be able to determine whether the odour they may experience is coming from the poultry farms or composting odour, thus these odours are not considered to be additive.

However, for the purposes of this assessment, the cumulative odour impacts have been examined due to all of the odours from the proposed operations and the existing poultry farms combined. Potential odour sources significantly more than 3km from the Site were not considered in the cumulative assessment due to their likely low level of odour contribution.

In the absence of any Site-specific odour measurements for these poultry farm operations, an emission estimation methodology was developed based on data presented in the *Broiler Farm Odour Environmental Risk Assessment* document (ERM, 2012). A summary of the odour emission rates applied to the process of broiler farming is outlined in Table 6-8.

Table 6-8: Summary of odour emission rates for poultry farms

Week	OER/s per 1000 birds
1	18
2	73
3	216
4	426
5	616
6	789
7	928
8	1,027

Source: ERM, 2012

The observed dimensions of each poultry shed obtained from available Google Earth imagery with an assumed stocking density of approximately 15 birds per square metre were used to calculate the number of birds likely to be housed in each shed. Table 6-9 outlines the assumed parameters for each of the farm operations and Figure 6-3 presents the location of each farm.

Table 6-9: Assumed poultry farm operation parameters in the modelling

Source	Type	No. sheds	No. birds per shed
Poultry farm 1	Broiler	5	202,500
Poultry farm 2	Broiler	24	589,620
Poultry farm 3	Breeder	16	331,200

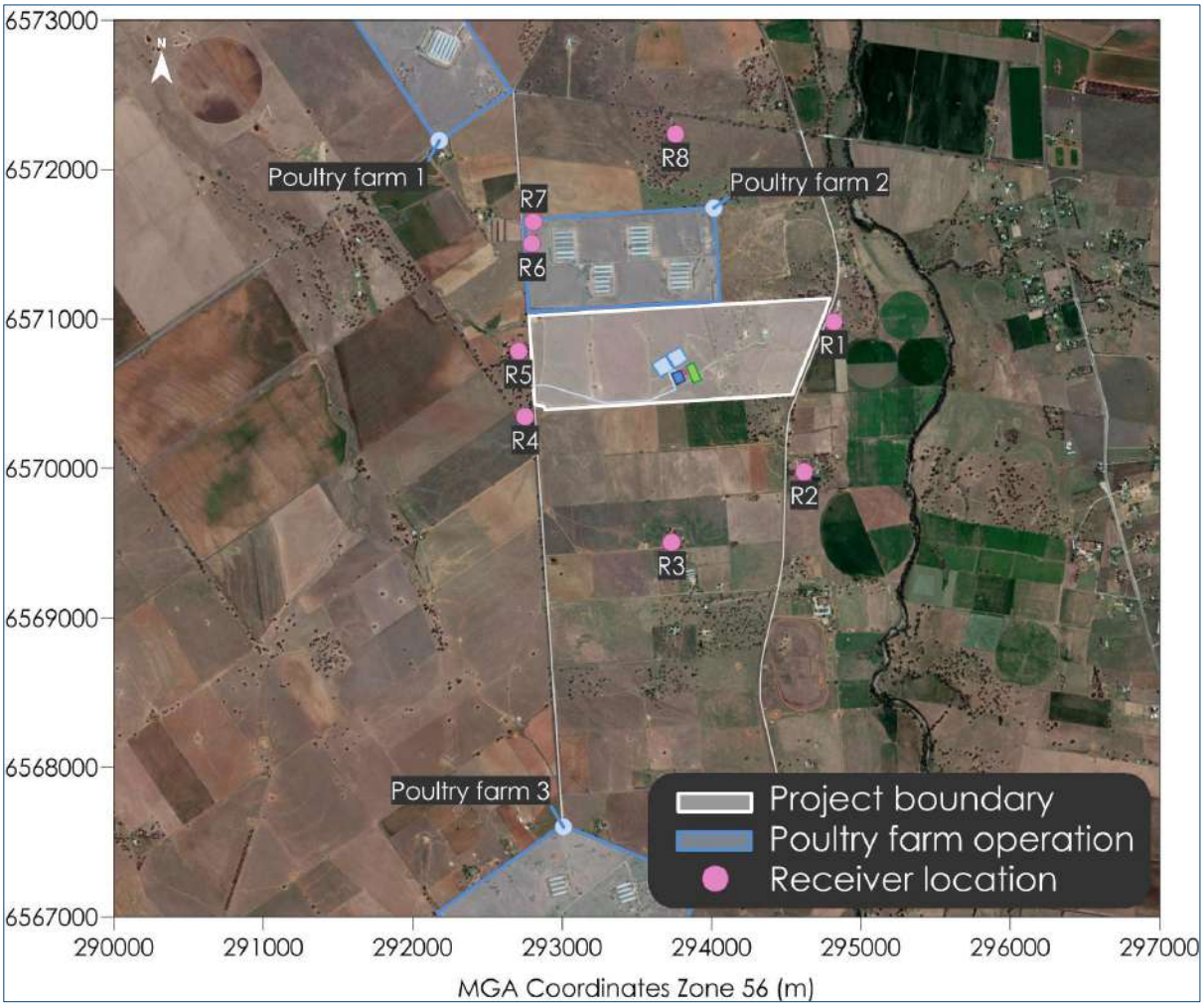

Figure 6-3: Surrounding poultry farm locations

Predicted incremental odour impacts

The spatial distribution of the dispersion modelling predictions for the modelled Proposal is presented as an isopleth diagram showing the 99th percentile nose-response ground level odour concentrations in Figure 6-4.

The results indicate that odour levels due to the Proposal will be below the applicable criteria at all sensitive receiver locations.

The odour isopleths in Figure 6-4 are generally rounded, and indicate that there are no significant drainage flows in any

specific direction as the area is relatively flat, for example the Peel River falls less than 20m in elevation over ten kilometres. The results show some drift in odour occurs towards the north which is consistent with the prevailing winds and the likely drainage flow of the Peel River Valley. Table 6-10 presents the discrete dispersion modelling results at each of the assessed sensitive receiver locations.

Table 6-10: 99th percentile nose-response average ground level odour concentrations – Proposal (OU)

Receiver ID	Predicted level	Odour assessment criterion*
R1	2	5
R2	2	5
R3	2	5
R4	3	5
R5	3	5
R6	4	5
R7	4	5
R8	1	5

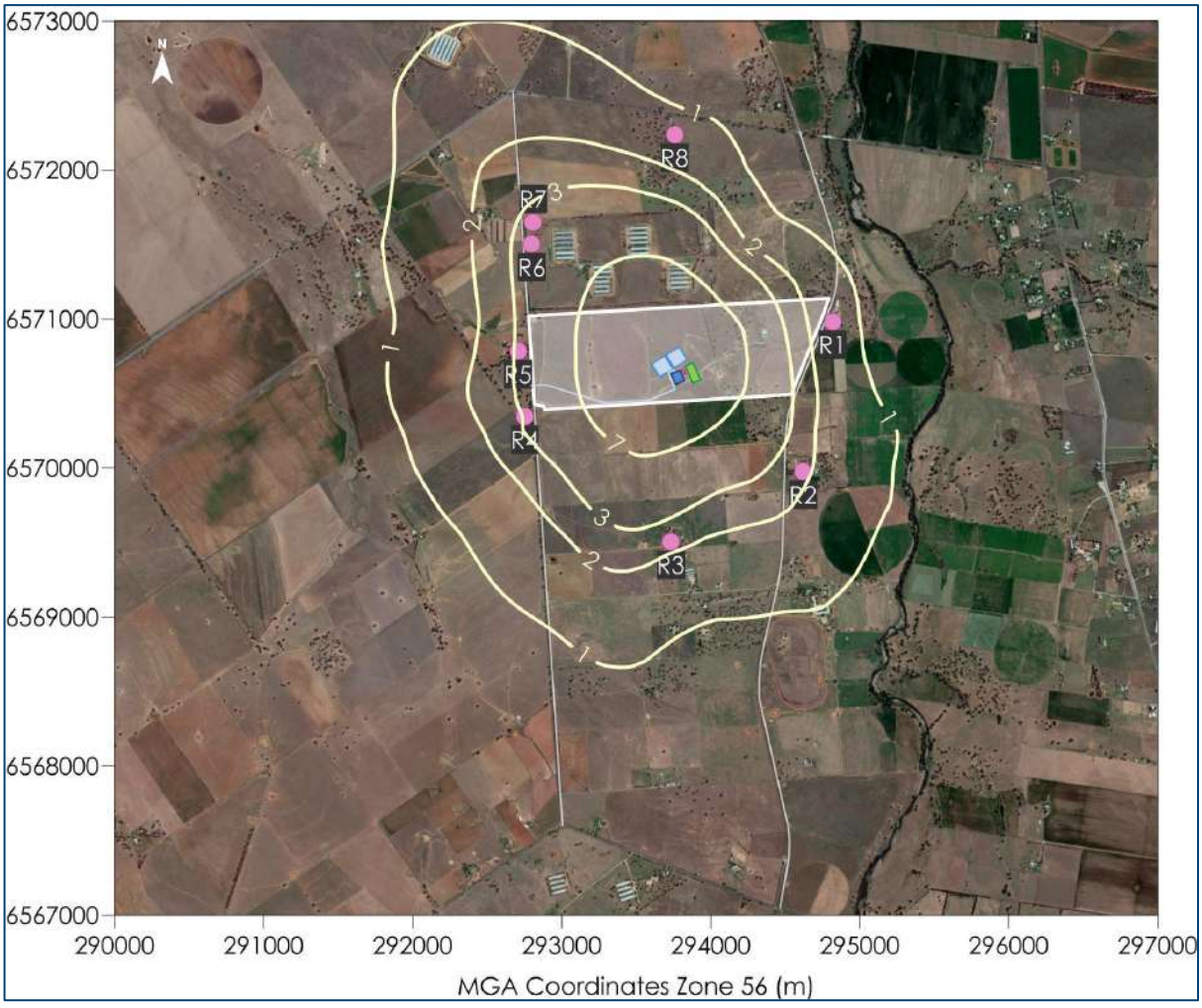

Figure 6-4: Predicted 99th percentile nose-response average ground level odour concentrations – Proposal only

Predicted cumulative odour impacts

In regard to cumulative odour impacts, the NSW odour policy states:

> "To ensure that offensive odour impacts are maintained within acceptable levels, the incremental increase in ambient odours due to emissions resulting from a facility's operations should be assessed against the odour assessment criteria. Where it is likely that two or more facilities with similar odour character will result in cumulative odour impacts, the combined odours due to emissions resulting from all nearby facilities should also be assessed against the odour assessment criteria."

Generally, the character of the odour generated from the poultry farms would be different to the odour from this Proposal and would therefore not be assessed cumulatively. However, for the purposes of this report, the potential cumulative impacts of the all of the odours from the Proposal and existing poultry farms combined have been assessed.

Figure 6-5 presents the predicted 99th percentile nose-response ground level odour impact for the Proposal and other sources. Table 6-11 presents the discrete dispersion modelling results at each of the assessed sensitive receiver locations.

The results indicate that the predicted odour levels for the existing sources (i.e. poultry farms) would be above the odour assessment criterion at all locations and with the addition of the Proposal would also be above the odour assessment criterion. The estimated change in odour levels associated with this Proposal ranges from <1 OU to 2 OU for the various sensitive receiver locations.

This level of change in odour is unlikely to be noticed relative to the level of existing odour impacts which would already be experienced at the sensitive receiver locations.

Table 6-11: 99th percentile nose-response average ground level odour concentrations – All odour sources (OU)

Receiver ID	Predicted level due to existing sources	Predicted level due to existing sources with the Proposal	Odour assessment criterion	Change in odour level
R1	9	9	5	<1
R2	8	10	5	2
R3	7	9	5	2
R4	16	17	5	<1
R5	26	26	5	<1
R6	118	120	5	2
R7	105	108	5	2
R8	23	24	5	<1

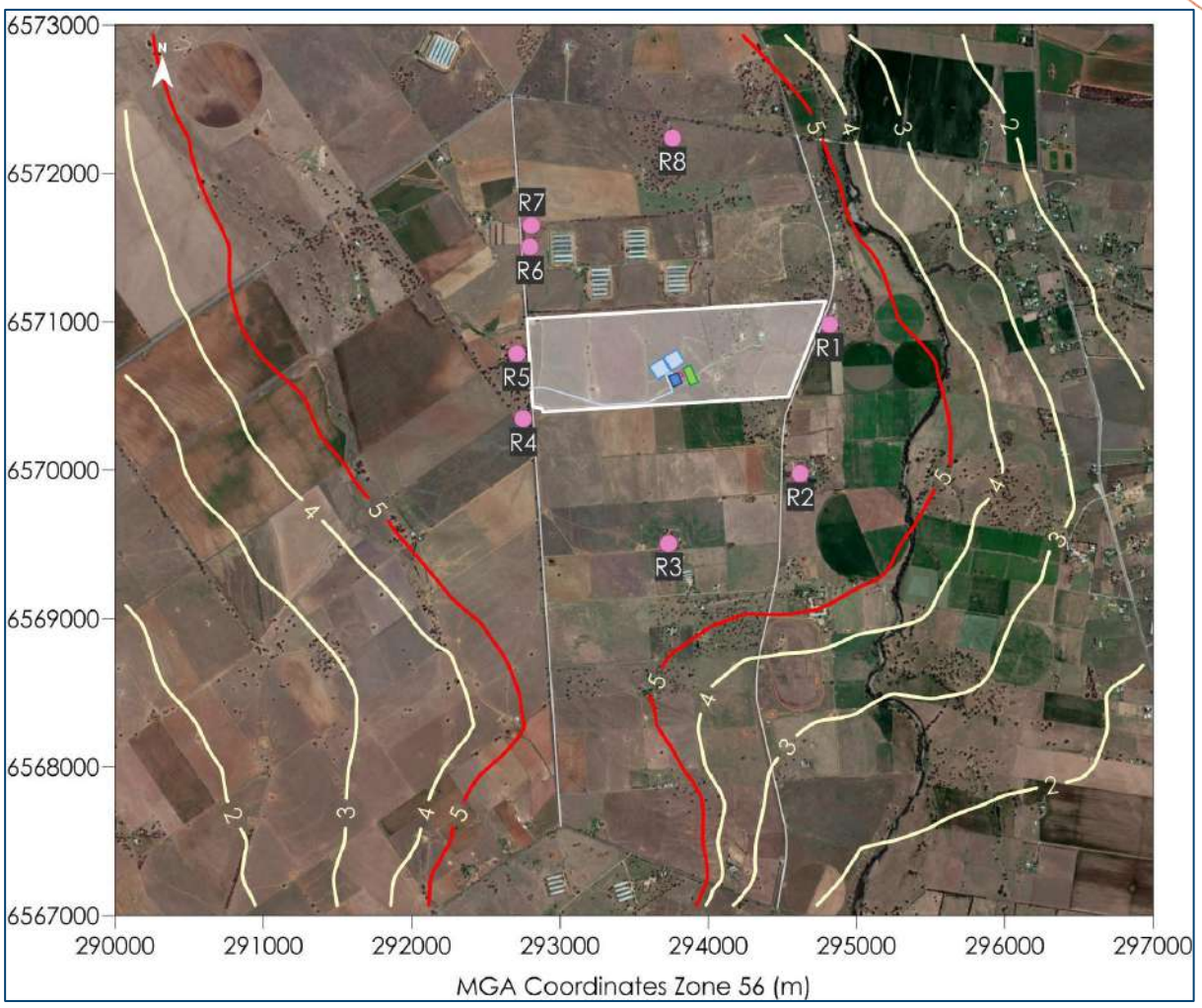

Figure 6-5: Predicted 99th percentile nose-response average ground level odour concentrations – Proposal and other sources

6.1.4 Mitigation Measures

The Proposal will apply appropriate management measures as listed below to ensure any potential occurrence of excessive air and odour emissions are minimised from the Site.

Table 6-12 Mitigation measures for air quality and odour impacts

Ref	Mitigation measures
Construction Mitigation Measures	
A1	Activities shall be assessed during adverse weather conditions and modified as required to reduce dust generation (e.g. cease activity where reasonable levels of dust cannot be maintained).
A2	Engines to be switched off when not in use for any prolonged period
A3	Vehicles and plant will be fitted with pollution reduction devices wherever possible.
A4	Maintain and service vehicles according to manufacturer's specifications.

Ref	Mitigation measures
A5	Haul roads / transport routes to be sited away from sensitive receivers where possible.
A6	Minimise area of exposed surfaces.
A7	Water suppression on exposed areas and stockpiles.
A8	Minimise amount of stockpiled material.
A9	Locate stockpiles away from sensitive receivers.
A10	Apply barriers, covering or temporary rehabilitation.
A11	Progressive staging of construction activities.
A12	Rehabilitation of completed sections as soon as practicable.
A13	Keep ancillary vehicles off exposed areas.
A14	Reduce drop heights from loading and handling equipment.
A15	Watering of haul roads (fixed or mobile) when required.
A16	Sealed haul roads to be cleaned regularly.
A17	Restrict vehicle traffic to designated routes that can be managed by regular watering.
A18	Impose speed limits.
A19	Wheel wash, grids or coarse aggregate near exit points to minimise dirt track out.
A20	Street cleaning to remove dirt tracked onto sealed roads.
A21	Covering vehicle loads when transporting material off- site.
Operational Mitigation Measures	
A22	An Operational Environmental Management Plan (OEMP) will be prepared for the Proposal with a Waste Management Plan (WMP) Management measures to minimise odour and maintain plant and infrastructure on-site will be included in the plan.
A23	All sorting and receival of materials to occur within the enclosed Receival Shed and doors to the shed are to remain closed when not in use.

Ref	Mitigation measures
A24	Co-ordinate the delivery schedule to avoid a queue of incoming or outgoing trucks for extended periods of time.
A25	Engines of on-site vehicles and plant are to be switched off when not in use.
A26	Vehicles delivering, and handling material are to stick to the formed roads/ paths to minimise fugitive dust and also spillage and potential fugitive odour.
A27	Spill management procedures to ensure immediate clean-up of any spill.
A28	Maintain an odour complaint logbook and in the event of a complaint conduct an immediate investigation of any odour sources, together with appropriate actions to eliminate any identified excessive odour.
A29	Vehicles and plant are to be fitted with pollution reduction devices in accordance with manufacturer specifications.
A30	Maintain and service vehicles according to manufacturer's specifications.
A31	Regularly clean all hard stand areas.
A32	Avoid significant handling of material during poor dispersion conditions where possible (e.g. undertake pile turning in the middle parts of the day in preference to the evening or early morning).

6.2 Noise and Vibration

6.2.1 Introduction

A Noise and Vibration Impact Assessment (NVIA) was prepared by Muller Acoustic Consulting to assess the potential construction, operational and road traffic noise and vibration impacts associated with the Proposal. The NVIA is provided in **Appendix F**.

The NVIA was completed to quantify potential acoustic impacts associated with the operation and construction of the ORF on the surrounding community and will accompany the EIS that is being prepared to assess the proposed development. The NVIA has been prepared in accordance with the following policies and guidelines:

- Environment Protection Authority's (EPA's), Noise Policy for Industry (NPI), 2017;
- Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline (ICNG); and
- Department of Environment, Climate Change and Water NSW (DECCW), Road Noise Policy (RNP), 2011.

A summary of the investigations and key findings of the NVIA is provided below.

6.2.2 Existing Environment

The Proposal is located in a rural landscape with rural residential, agricultural and commercial receivers. The closest residential receiver is TRC1, which is the dwelling associated with the property. The closest non-associated sensitive receivers are R10 on Wallamore Road, R5 and R6 situated on Gidley Appleby Road. The closest commercial receiver is C1 the ProTen Poultry Farm immediately to the north of the Site.

The locations of sensitive receivers in relation to the Proposal lot boundary are shown in Figure 6-6 and Table 6-13. Two properties (R6 and R7) located to the north east of the Site are within the ProTen poultry farm property but are considered as residential receivers for the purposes of the assessment,

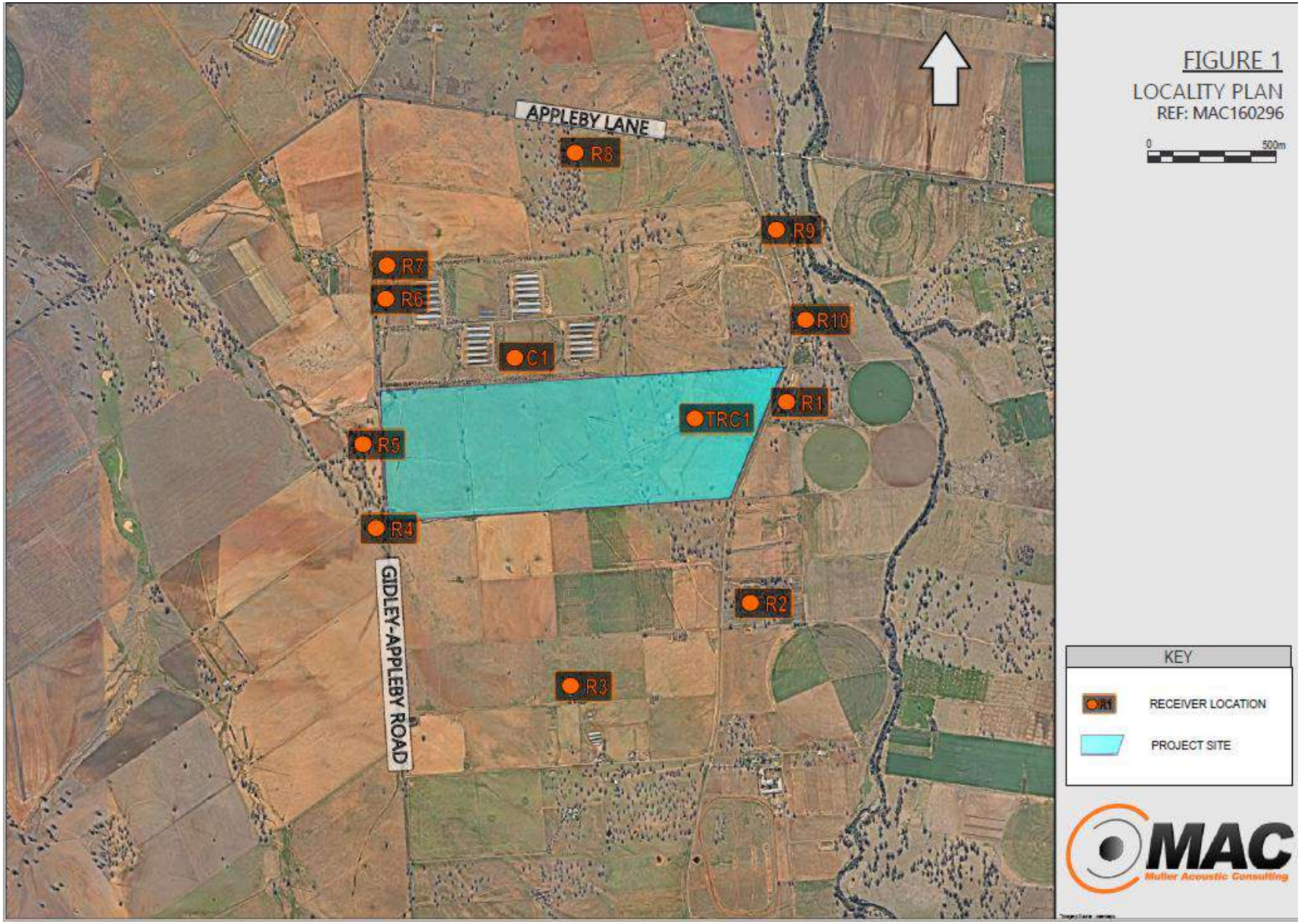

Figure 6-6 Sensitive Receivers – Noise

Table 6-13 Sensitive receivers (Source: MAC, 2019)

Reference	Address	Ownership	Approximately distance to Property (m)
TRC1	284 Gidley Appleby Road	TRC	Within the Proposal boundary
R1	348 Gidley Appleby Road	Private	71 m
R2	306 Gidley Appleby Road	Private	526 m
R3	180 Gidley Appleby Road	Private	867 m
R4	279 Gidley Appleby Road	Private	85 m
R5	315 Gidley Appleby Road	Private	50 m
R6	372 Gidley Appleby Road	Private	477 m
R7	372 Gidley Appleby Road	Private	623 m
R8	534 Appleby Lane	Private	712 m
R9	"Oakleigh" – 372 Gidley Appleby Road	Private	691 m
R10	87 Wallamore Road	Private	60m
C1	Poultry Facility 2 372 Gidley—Appleby Road	Private	70m

Proposal Specific Noise Criteria

The following assessment criteria have been determined as relevant to the Proposal.

- Proposal Intrusiveness Noise Levels (PINLs); and
- Proposal Amenity Noise Levels (PANLs).

The PINLs for the Proposal have been determined based on the RBL +5dBa and are summarised in Table 6-14.

Table 6-14 Proposal Intrusiveness Noise Levels

Receiver Type	Period	Adopted RBL dB LA90	PINL dB LAeq (15min)
Residential	Day 7am – 6pm Monday – Saturday 8am – 6pm Sundays and Public Holidays	35	40
	Evening 6pm to 10pm	30	35
	Night The remaining periods	30	35

The PANLs for residential receivers are outlined in Table 6-15.

Table 6-15 Proposal Amenity Noise Levels

Receiver Type	Noise Amenity Area	Assessment Period	Recommended ANL dB LA eq (period)	PANL dB LAeq(period)	PANL dB LAeq (15min)
Residential	Rural	Day	50	45	48
		Evening	45	40	43
		Night	40	35	38
Commercial	Commercial	When in use	65	60	63

In accordance with the NPI, the Proposal Noise Trigger levels are the lower of the PINL or PANL and the maximum noise level screening criteria is based on night time RBLs and trigger values.

Table 6-16 Proposal noise trigger levels (Source: MAC,2019)

Receiver Location	Period	PNTL dB LA eq(15min)	Maximum Noise Level LAeq(15min)	Minimum Noise Level LAmax
TRC1 R1 – R10	Day	40	40	52
	Evening	35		
	Night	35		
C1	All	63	N/A	N/A

As per the ICNG, this assessment has adopted a construction noise management level (NML) for residential receivers of 35dBA RBL + 10dB = 45dB LAeq(15min). For C1 (adjacent poultry facility) the commercial receiver NML of 70dBA was adopted in accordance with the ICNG.

The Road Traffic Noise Assessment Criteria has adopted the 'Freeway / arterial / sub-arterial road' category for the proposed haulage routes which is 60dBA LAeq(15hr) during the day and 55dBa LA eq(9hr) at night. Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2dB, which is generally accepted as the threshold of perceptibility to a change in noise level. residential receivers of 35dBA RBL + 10dB = 45dB LAeq(15min). For C1 (adjacent poultry facility) the commercial receiver NML of 70dBA was adopted in accordance with the ICNG.

6.2.3 Impact Assessment

Vibration

The potential for vibration impacts have been qualitatively reviewed for this assessment. The review identifies that vibration impacts from the ORF would be negligible.

The Construction Noise Strategy (Transport for NSW, 2012) sets out safe working distances to achieve the human response criteria for vibration. The minimum distance to achieve the residential human response criteria for continuous vibration using a greater than 18 tonne roller is 100m, this would be significantly less for wheeled plant, such as wheel loaders and trucks which will be the main vibration generating source on-site. The nearest privately-owned residential receiver to the ORF is approximately 950m away, while the nearest residential receiver to the proposed intersection upgrade works is approximately 175m away. Therefore, human exposure to vibration is not expected. Furthermore, where the human response criteria are satisfied, the structural criteria for sensitive receivers (3mm/s) will be achieved.

Construction noise impact

The NVIA adopted a worst-case modelling scenario for the assessment to represent maximum noise emissions during construction activities at the Site and ancillary works area. Indicative sound power levels were adopted to assess

construction noise for the proposal. Sound power levels for relevant construction equipment are provided in Table 6-17. Predicted Noise levels were below the NMLs at all assessed receivers as outlined in *Table 6-18*.

Table 6-18

Table 6-17 Equipment Sound Power Levels – Construction (Source: MAC noise database)

Item	dB LAeq(15min) Sound Power Level (SWL)	Period of operation
Scraper/Grader	108	Day only
Excavator (x1)	106	Day only
Roller (x1)	108	Day only
Road Truck (x1)	102	Day only
Bobcat (x1)	103	Day only
Water Cart (x1)	103	Day only
Crane (x1)	95	Day only
Elevated work platform (x2)	94	Day only
Concrete Truck/Concrete Pump (x1)	85	Day only
Pneumatic Hand tools	97	Day only

Table 6-18 Predicted Noise levels from Construction, dBA LAeq (15 min)

Receivers	Construction Scenario					
	Site Establishment	Intersection Upgrade	Internal Access Roads	Bulk Earth Works	Building Works	NML
Residential Receivers						
TRC1	40	29	42	47	47	45
R1	33	25	35	39	42	45
R2	35	26	34	39	42	45
R3	36	30	34	37	42	45
R4	37	51	49	37	42	45
R5	36	50	48	37	42	45
R6	32	36	37	35	40	45
R7	31	34	35	35	39	45

R8	28	26	31	33	37	45
R9	28	23	31	34	37	45
R10	30	24	33	36	39	45
Commercial Receivers						
C1	41	33	44	47	48	70

Construction of the proposal will generate up to 20 one-way trucks movements or 40 movements per day (see Section 6.3). The NVIA assessed road noise levels at the closest potentially affected residences adjacent to the proposed haul route and the entry into the ORF.

The results of the construction road noise assessment are presented in Table 6-19. The assessment concluded that traffic noise generated by construction of the proposal will likely exceed the affected Noise Management Level (NML) of 45 dBA at residential locations R5 and R6, when the works are located in close proximity to the Gidley Appleby Road. As the construction progresses towards the east the affected noise sensitive receivers will be less affected. Approximately 250m to the east of the proposed access intersection location, the modelled noise levels for the construction of the internal access roads are demonstrated to comply with the NML. Notwithstanding, noise control measures to address impacts are provided Section 6.2.4.

At all receiver locations, under all construction scenarios the constriction works are demonstrated to comply with the highly affected NML of 75dBA.

The existing road noise calculations were derived by data using traffic volumes obtained from counting station on Manilla Road (Station ID92187, Roads and Maritime, 2007). This was calculated value assuming 40 truck movements per day (20 one-way truck movements)

Table 6-19 Construction Road Traffic Noise (Day LAeq(15hr), dBA (Source: MAC noise database)

Distance to nearest receiver (metres)	**Assessment criteria**	**Existing traffic**	**Future Proposal Traffic Noise**	**Existing + Future Proposal Combined**
Day LAeq(15gr), dBA				
20	60	58.1	54.4	59.7

Operational noise impact

This worst-case modelling scenario was adopted in this assessment to represent noise emissions during the maximum operations of the ORF with plant operating at representative positions within the Site boundary.

The operational noise sources associated with importation and loading of material at the ORF were assumed to operate during the day assessment period (i.e. 7am to 6pm). Pumps and fans associated with processing of organic materials were assumed to operate 24 hours per day, 7 days per week.

Traffic generation of the ORF are anticipated to generate up to 20 trucks (40 truck movements) in a peak hour which are comprised of a combination of truck types including, kerbside, collection vehicles, dual axle tippers, semi—trailers, truck and dogs and double—B's (MAC 2019).

Noise emission levels used for the purposes of the modelling are provided in Table 6-20.

Table 6-20 Equipment sound levels - Operation

Item	dB LAeq(15min) Sound Power Level (SWL)	Period of operation
Operational Noise Sources		
Front End Loader	104	Day only
Road Trucks (x3)	102	Day only
Truck Idle (x1)	85	Day only
Shredder (x1)	110	Day only
Screen (x1)	109	Day only
Tunnel Ventilation Fans (x7)	72	Day, Evening and Night
Biofilter Fan (x1)	75	Day, Evening and Night
Pumps (x3)	78	Day, Evening and Night
Maximum Noise Sources (Sleep Disturbance), LAmax		
All Pumps and Fans (logarithmic sum)	85	Night only

The predicted noise levels at each receiver during calm and noise enhancing meteorological conditions for ORF operations are provided in *Table 6-21*. The results of the model show that noise emissions from the ORF will satisfy the PNTL at all assessed privately owned receivers for worst case operations.

Table 6-21 Predicted Operational Noise Levels, dBA LAeq (15 min) (Source: MAC noise database)

Receivers	Predicted Noise Levels				PNTL		
	Calm Meteorology		Worst Case Meteorology1				
	Day	Evening	Night	Night	Day	Evening	Night
Residential Receivers							
TRC1	42	<20	<20	<20	40	35	35
R1	37	<20	<20	<20	40	35	35
R2	38	<20	<20	<20	40	35	35
R3	38	<20	<20	<20	40	35	35
R4	39	<20	<20	<20	40	35	35

R5	37	<20	<20	<20	40	35	35
R6	33	<20	<20	<20	40	35	35
R7	31	<20	<20	<20	40	35	35
R8	29	<20	<20	<20	40	35	35
R9	31	<20	<20	<20	40	35	35
R10	34	<20	<20	<20	40	35	35
Commercial Receivers							
C1	40			<20	63		

Operational Road Noise

The majority of truck movements to the Site are received from the south, with approximately 60% inbound via Wallamore Road — Gidley Siding Road — Gidley Appleby Road, 30% inbound via Oxley Highway —Appleby Lane — Gidley Appleby Road and 10% inbound via Manilla Road — Appleby Lane — Gidley—Appleby Road.

Outbound traffic is restricted to right turns onto Gidley—Appleby Road utilising Appleby Lane to access the Oxley Highway (60%) and Manilla Road (40%).

The proposed maximum daily truck movements associated with garbage trucks (incoming) and B-Doubles (outgoing) is estimated that 20 trucks in a peak hour may visit the Proposed facility (refer traffic section 6.3).

This assessment has assumed that truck volumes equivalent of up to three peak hourly periods (i.e. 120 movements) occur within a single day, which is a maximum worst case scenario.

The nearest residences to the proposal Site haulage route are situated on Wallamore Road and Manilla Road at a near offset distance of approximately 20m. Wallamore Road represents the predominant inbound travel route while Oxley Highway represents the predominant outbound travel route for the Site.

The results of the operational road noise assessment are presented inTable 6-22. The assessment concluded that traffic noise generated by operation of the proposal will result in a change of 6 Day LAeq (15hr) dBA for Wallamore Road and 1.6 for Manilla Road.

Table 6-22 Operational Road Traffic Noise levels (MAC, 2019)

Road	**Distance to Nearest Receiver (m)**	**Assessment Criteria**	**Existing Traffic1**	**Future Proposal Traffic Noise**	**Existing + Future Proposal Combined**
Day LAeq(15hr), dBA					
Wallamore Road	20	60	49.2	53.9	55.2
Oxley Highway	25	60	63.7	53.9	63.8
Manilla Road	20	60	58.1	52.2	59.1

Sleep disturbance results

In determining the assessment of sleep disturbance, typical LAmax noise levels from pumps and fans operating within the ORF were assessed to the nearest residential receivers. The use of the LAmax noise level provides a worst-case prediction since the LA1(1minute) noise level of a noise event is likely to be less than the LAmax. For the sleep disturbance assessment, a sound power level of 85dBA has been adopted and is representative of the maximum noise

emissions associated with combined operation of all pumps and fans operating within the ORF.

The results from the sleep disturbance results reveal that all assessed receivers including noise emissions during adverse meteorological conditions will have a predicted LAmax noise level less than 20dB and sleep disturbance Noise Criterion of 52dB.

Predicted noise levels from LAmax events for assessed receivers identify that sleep the disturbance criterion will be satisfied for all assessed receivers.

Based on the modelling results, construction and operation of the Proposal will achieve compliance with relevant criteria as outlined in this section except at C1 which will exceed the criteria in calm meteorological conditions when in use during evenings (refer*Table 6-21*).

6.2.4 Mitigation Measures

The Proposal will apply appropriate management measures as listed below to ensure any potential noise impacts generated from the Proposal are minimised as outlined in Table 6-23.

Table 6-23 Noise and vibration mitigation measures

Ref	Mitigation measures
Construction mitigation measures	
N1	Prepare and implement a Construction Environmental Management Plan to manage potential noise impacts including: • Description of responsibilities regarding the management of noise emissions from the Site. • Any relevant conditions/requirements of consent / approval. • Methodologies adopted to monitor noise emissions from the Site against relevant criteria; and • A mechanism for assessing noise monitoring results against the relevant noise criteria.
N2	Implement boundary fences / retaining walls as early as possible during construction to maximise their attenuation benefits to surrounding receivers.
N3	Toolbox and induction of personnel prior to shift to discuss noise control measures that maybe implemented to reduce noise emissions to the community.
N4	Where possible use mobile screens or construction hording to act as barriers between construction works and receivers.
N5	All plant should be shut down when not in use. Plant to be parked/started at farthest point from relevant assessment locations when practicable.
N6	Operating plant in a conservative manner (no over-revving).
N7	Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off—site.

Ref	Mitigation measures
N8	Selection of the quietest suitable machinery available for each activity.
N9	Avoidance of noisy plant/machinery working simultaneously where practicable.
N10	Minimisation of metallic impact noise.
N11	All plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm.
N12	Undertake letter box drops to notify receivers of potential works prior to commencement of construction.
Operation mitigation measures	
N14	Prepare and implement a Noise Management Plan (NMP) to be included within the Operational Environmental Management Plan to manage potential noise impacts including: • provide the ORF employees and contractors with a description of their responsibilities regarding the management of noise emissions from Site; • address any relevant conditions/requirements of consent / approval; • describe the methodologies adopted to monitor noise emissions from the Site against relevant criteria; • provide a mechanism for assessing noise monitoring results against the relevant noise criteria; and • provide a means for the establishment of best practice management with respect to minimising noise emissions/impacts to the broader community.
N15	Operational working hours would be restricted to 8am to 4:45pm Monday to Sundays.
N16	Prepare and implement a complaints management plan including a contact phone number for neighbours to contact the operator should they have concerns over noise emissions.

6.3 Traffic and Transport

6.3.1 Introduction

A Traffic Impact Assessment (TIA) was prepared by pitt&sherry to assess potential traffic impacts from the construction and operation of the proposal on the existing road network, including intersections, public transport, road safety, traffic generation and traffic distribution. The TIA is provided in **Appendix G** and the key findings of the TIA are provided below.

The report provided in **Appendix G** has been prepared in accordance with the *Austroads Guide to Traffic Management – Part 12 (2016)* and the *RMS Guide to Traffic Generating Developments (2002).*

6.3.2 Existing Environment

The Site is located on Gidley Appleby Road and is bounded by Wallamore Road (unsealed) to the east. Three key

haulage routes near the Site are Oxley Highway located approximately 5km west of the Site, Manilla Road located approximately 2km east of the Site and Wallamore Road (sealed) located approximately 3.3 km south of the Site.

A description of the key haulage routes is provided below and shown on Figure 6-7. All of the haulage routes are designated as B-double routes and are sealed roads with a speed limit of 100 km/h.

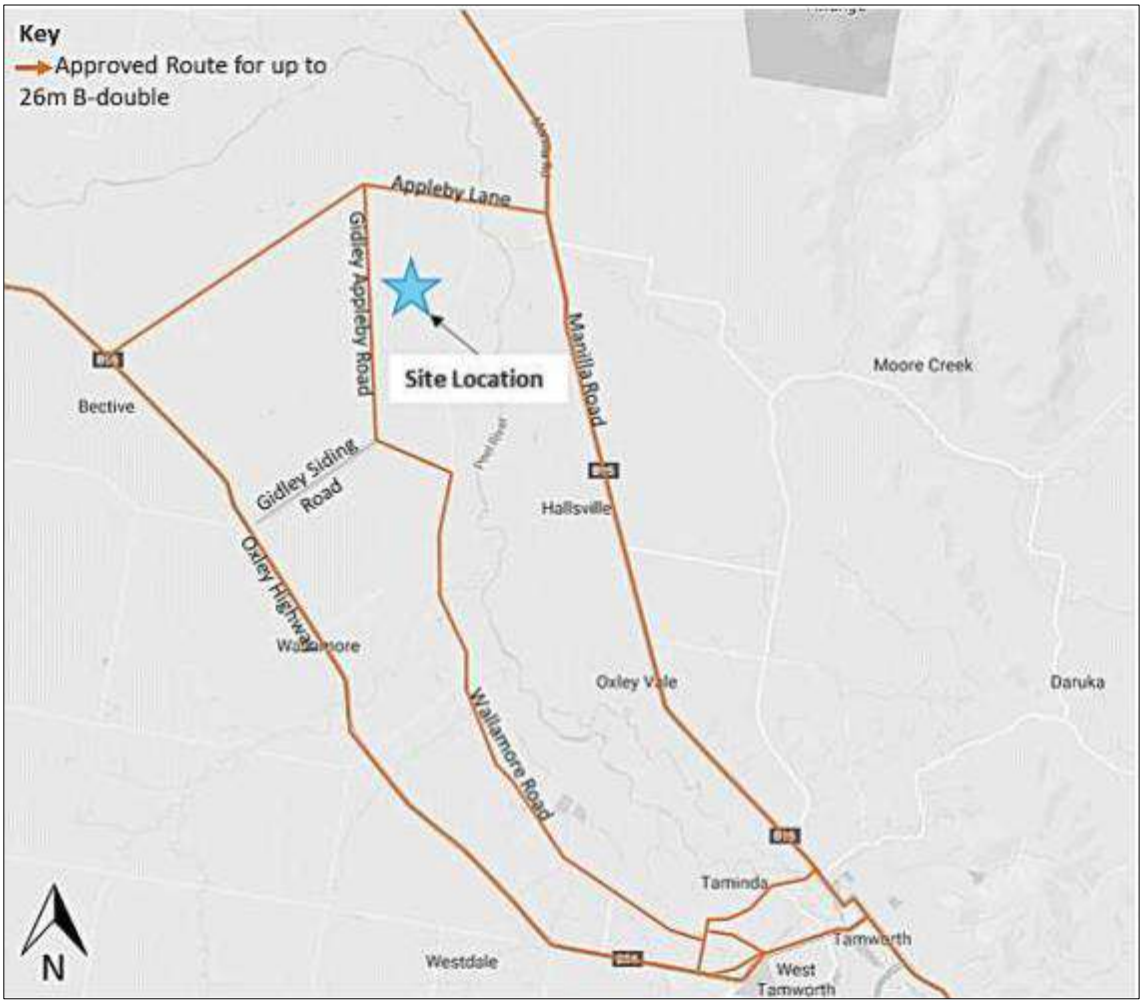

Figure 6-7 Approved Routes for Vehicles Up To 26m B-Double Trucks (Basemap Source: Google Maps, 2019, Route Source: RMS, 2016)

Gidley Siding Road, Gidley Appleby Road and Appleby Lane

Gidley Siding Road (shown in *Figure 6-8* and *Figure 6-9*), Gidley Appleby Road (shown in *Figure 6-10* and *Figure 6-11*) and Appleby Lane (shown in *Figure 6-12* and *Figure 6-13*) are all Council owned local roads. Gidley Appleby Road operates in a north-south direction while Gidley Siding Road and Appleby Lane operate in an east-west direction. All three roads are subject to the default rural speed limit for sealed roads of 100 km/h.

Figure 6-8: Gidley Siding Road – facing east (Image Source: pitt&sherry, 2019)

Figure 6-9: Gidley Siding Road – facing west (Image Source: pitt&sherry, 2019)

Figure 6-10: Gidley Appleby Road – facing north (Image Source: pitt&sherry, 2019)

Figure 6-11: Gidley Appleby Road – facing south (Image Source: pitt&sherry, 2019)

Figure 6-12: Appleby Lane – facing east (Image Source: pitt&sherry, 2019)

Figure 6-13: Appleby Lane – facing west (Image Source: pitt&sherry, 2019)

Wallamore Road

Wallamore Road (shown in *Figure 6-14* and *Figure 6-15*) is a Council owned road that operates between Tamworth and Appleby Lane in a north-south direction. Between Tamworth and the Wallamore Road / Gidley Siding Road intersection, Wallamore Road is a sealed road with a single lane in each direction. To the north of the Wallamore Road/ Gidley Siding Road intersection, Wallamore Road continues as an unsealed road until its termination point at the Wallamore Road/ Appleby Lane intersection. Wallamore Road is a local road that is subject to the default speed limit of 100 km/h.

Figure 6-14: Wallamore Road – facing north (Image Source: pitt&sherry, 2019)

Figure 6-15: Wallamore Road – facing south (Image Source: pitt&sherry, 2019)

Manilla Road

Manilla Road (shown in Figure 6-16 and Figure 6-17) is a Council owned road operating between Tamworth and Barraba. In the vicinity of the Site, Manilla Road operates in a north-south direction and is configured with a single lane in

each direction with a dedicated right turn lane and left slip lane into Appleby Lane. A speed limit of 100km/h applies along Manilla Road in the vicinity of the Site.

Figure 6-16: Manilla Road – facing north (Image Source: pitt&sherry, 2019)

Figure 6-17: Manilla Road – facing south (Image Source: pitt&sherry, 2019)

Oxley Highway

The Oxley Highway (shown in *Figure 6-18* and *Figure 6-19*) is an RMS Classified State Road with a Highway Class. The highway connects Tamworth with other regional towns in NSW including Port Macquarie to the east and Gunnedah to the west. In the vicinity of the Site, the Oxley Highway travels in a northwest-southeast direction and is configured with a single lane in each direction. A speed limit of 100km/h applies along the Oxley Highway in the vicinity of the Site.

Figure 6-18: Oxley Highway – facing north-west (Image Source: pitt&sherry, 2019)

Figure 6-19: Oxley Highway – facing south-east (Image Source: pitt&sherry, 2019)

Traffic Volumes

Vehicle turning movement counts were undertaken by Matrix Traffic and Transport Data on Tuesday 14 May 2019 at the following intersections:

- Oxley Highway/ Appleby Lane
- Manilla Road/ Appleby Lane
- Gidley Appleby Road/ Appleby Lane/ Evans Lane.

Counts were undertaken during the morning peak period (8:00am – 9:30am) and the afternoon peak period (3:00pm – 4:30pm). It was determined from the survey data that the network morning peak hour occurs between 8:00am and 9:00am and the afternoon peak hour occurs between 3:30pm and 4:30pm.

In addition to the above turning movement counts, pitt&sherry staff undertook turning movement counts during the morning and afternoon peak on Thursday 1 August 2019 at the following intersections:

- Gidley Siding Road/ Gidley Appleby Road
- Wallamore Road/ Gidley Siding Road.

A summary of the existing morning and afternoon peak hour traffic volumes are shown in Figure 6-20 and Figure 6-21.

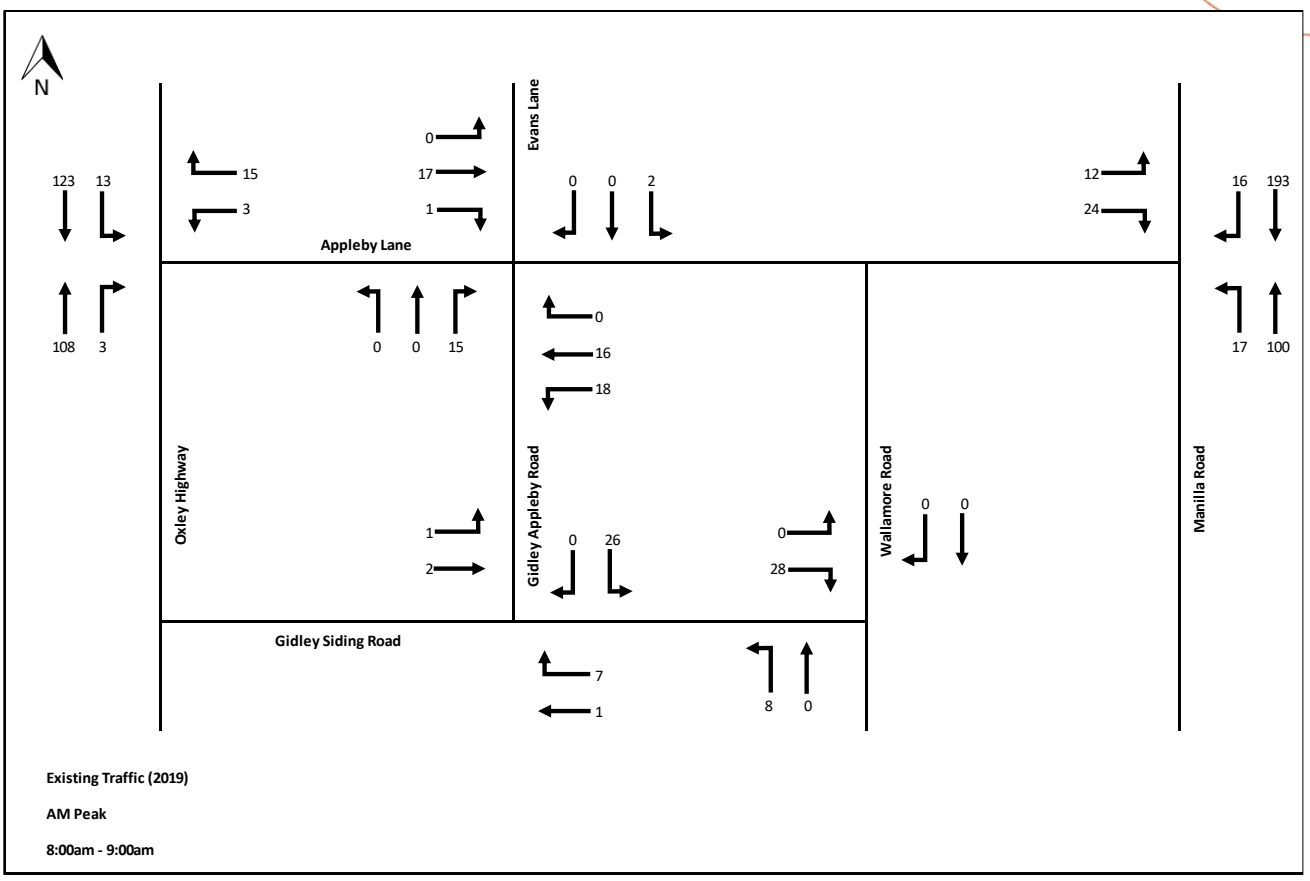

Figure 6-20 Existing (2019) morning Peak Hour Traffic Volumes (Data Source: Matrix, 2019 and pitt&sherry, 2019)

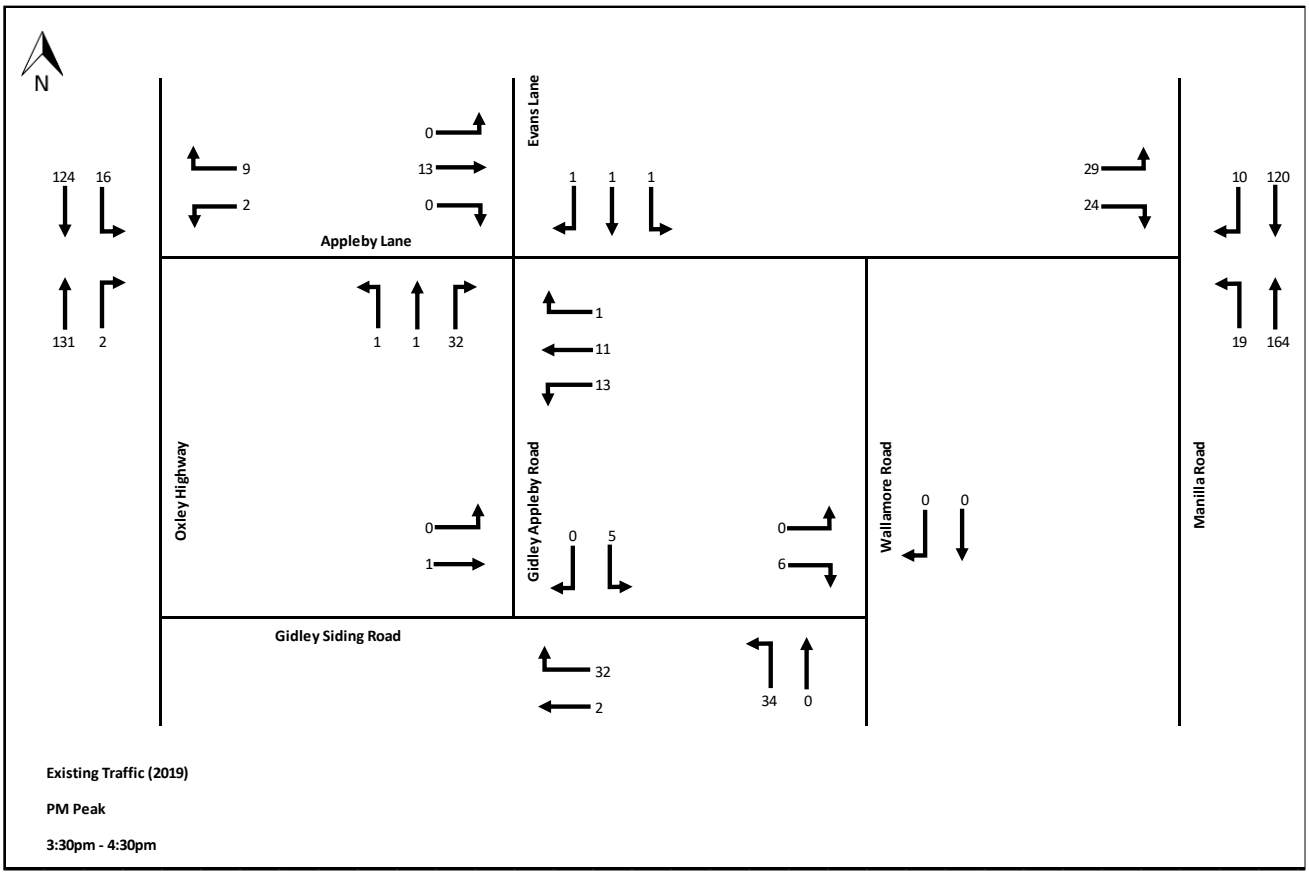

Figure 6-21 Existing (2019) afternoon Peak Hour Traffic Volumes (Data Source: Matrix 2019 and pitt&sherry, 2019)

A tube counter was also installed on Gidley Appleby Road between Sunday 10 August and Saturday 17 August to confirm the traffic volumes at the access point of the Site correlated with the other traffic data obtained.

Crash Data

The NSW Government *Transport for NSW Centre for Road Safety* have an interactive crash map that records all crash information in NSW. The crash history data for the most recent five-year period in the vicinity of the Site has been obtained from the crash map. The crash history is summarised in Table 6-24.

Table 6-24 Crash History Summary (Data Source: Transport for NSW, 2019)

Location	Road User Movement (RUM) Description	Severity
Gidley Appleby Road	70 – Off road left	Fatal
Appleby Lane/ Manilla Road intersection	53 – Overtaking turning vehicle	Moderate injury
Appleby Lane/ Wallamore Road	32 – Right Rear	Serious injury

Based on the crash history above, three crashes have occurred in the vicinity of the Site in the most recent 5-year period. All three crashes occurred in different locations and were different crash types. Based on this, there does not appear to be any crash patterns in the vicinity of the Site and the three crashes are considered to be isolated incidents.

Public Transport and Pedestrian and Cycling Facilities

There are no public transport or pedestrian and cycling facilities along Gidley Siding Road, Gidley Appleby Road and Appleby Lane.

6.3.3 Impact Assessment

Sight Distances

The Safe Intersection Sight Distance (SISD) has been assessed for vehicles at the following intersections:

- Oxley Highway/ Appleby Lane – sight distance to vehicles on the Oxley Highway;
- Manilla Road/ Appleby Lane – sight distance to vehicles on Manilla Road;
- Gidley Appleby Road/ Appleby Lane/ Evans Lane – sight distance to vehicles on Appleby Lane;
- Gidley Siding Road/ Gidley Appleby Lane – sight distance to vehicles on Gidley Appleby Road;
- Wallamore Road/ Gidley Siding Road – sight distance to vehicles on Gidley Siding Road; and
- Site Access/ Gidley Appleby Road – sight distance to vehicles on Gidley Appleby Road.

The SISD has been assessed against the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (2017)*. The SISD has been measured from a point 5m back from the edge of the major road at each intersection, in accordance with Figure 3.2 of the Austroads Guide.

As discussed, the speed limit on all roads is 100km/h. The SISD requirements for a 100km/h road (with a conservative reaction time of 2.5 seconds) is 262m. The observed sight distance from each intersection was greater than 300m in both directions. As such, the available sight distance at all intersections exceeds the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (2017)* sight distance requirements.

Construction Traffic

Based on information provided by TRC, a maximum of 20 trucks per day are expected during construction of the Proposal. A maximum of 40 truck movements per day are expected during construction of the facility. The trucks will

deliver materials to the Site for internal road pavements and building materials.

Traffic management will be required for undertaking these works. Traffic management plans would be prepared in accordance with RMS Guidelines and Australian Standard AS1742.3.

Operation Traffic

The traffic impact of the development has been assessed based on the following assumptions:

- The RMS traffic volume viewer shows declining traffic volumes on the Oxley Highway closest to the Site. Therefore, no growth has been applied to the current traffic volumes along Oxley Highway
- A growth rate of 3% per year has been applied to the current traffic volumes along Manilla Road and Wallamore Road
- No other significant developments are understood to be provided in the immediate vicinity of the Site within the foreseeable future
- Staff would enter and exit the Site outside the peak operational times and therefore would not contribute to the peak hour traffic generation.

Based on the above, the traffic volumes for the morning and afternoon peak hours at the study intersections after full development (2029) are shown in Figure 6-22 and Figure 6-23. Full development (2029) is as discussed in **Appendix G**.

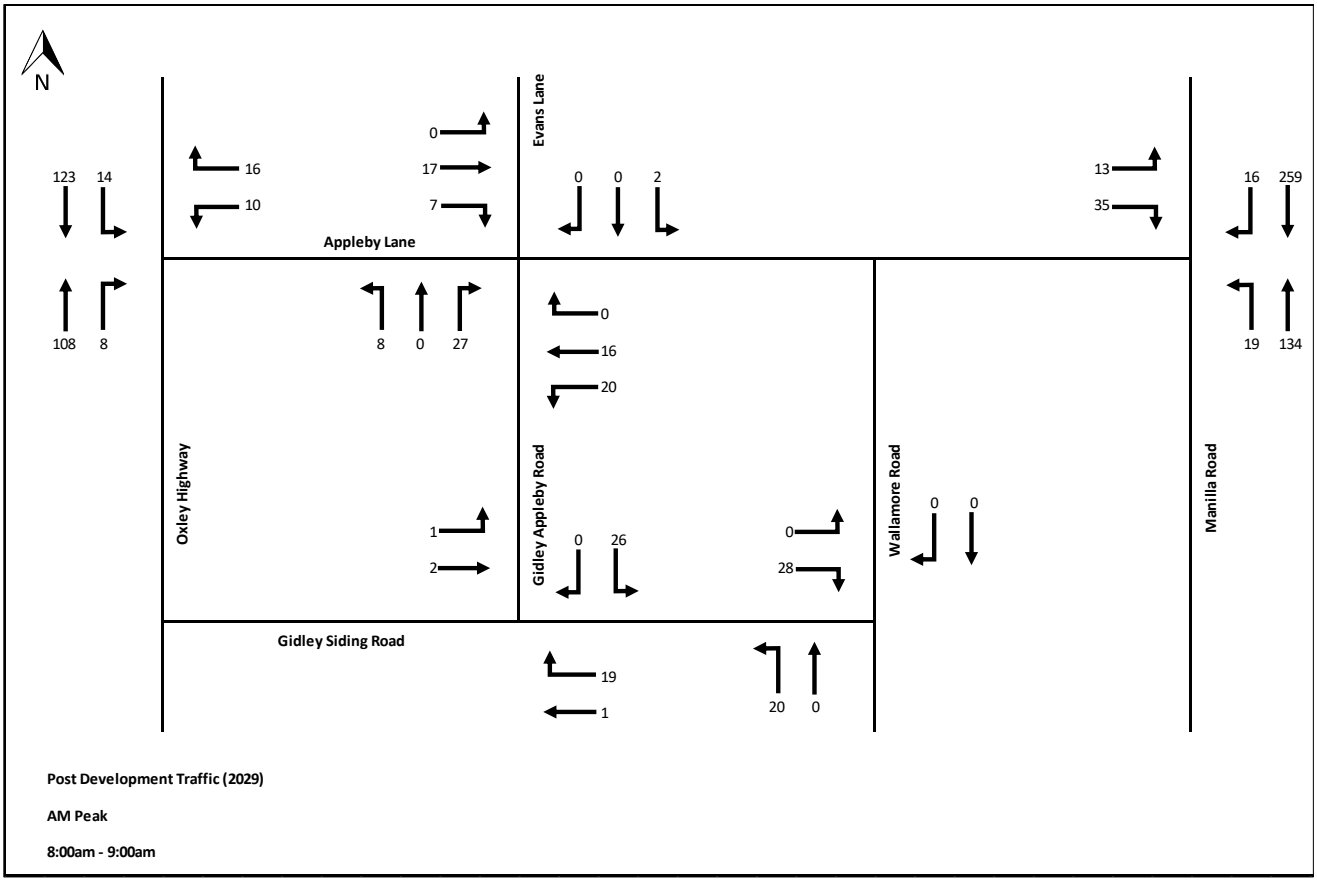

Figure 6-22 Full Development (2029) morning Peak Hour Traffic Volumes (Data Source: pitt&sherry, 2019)

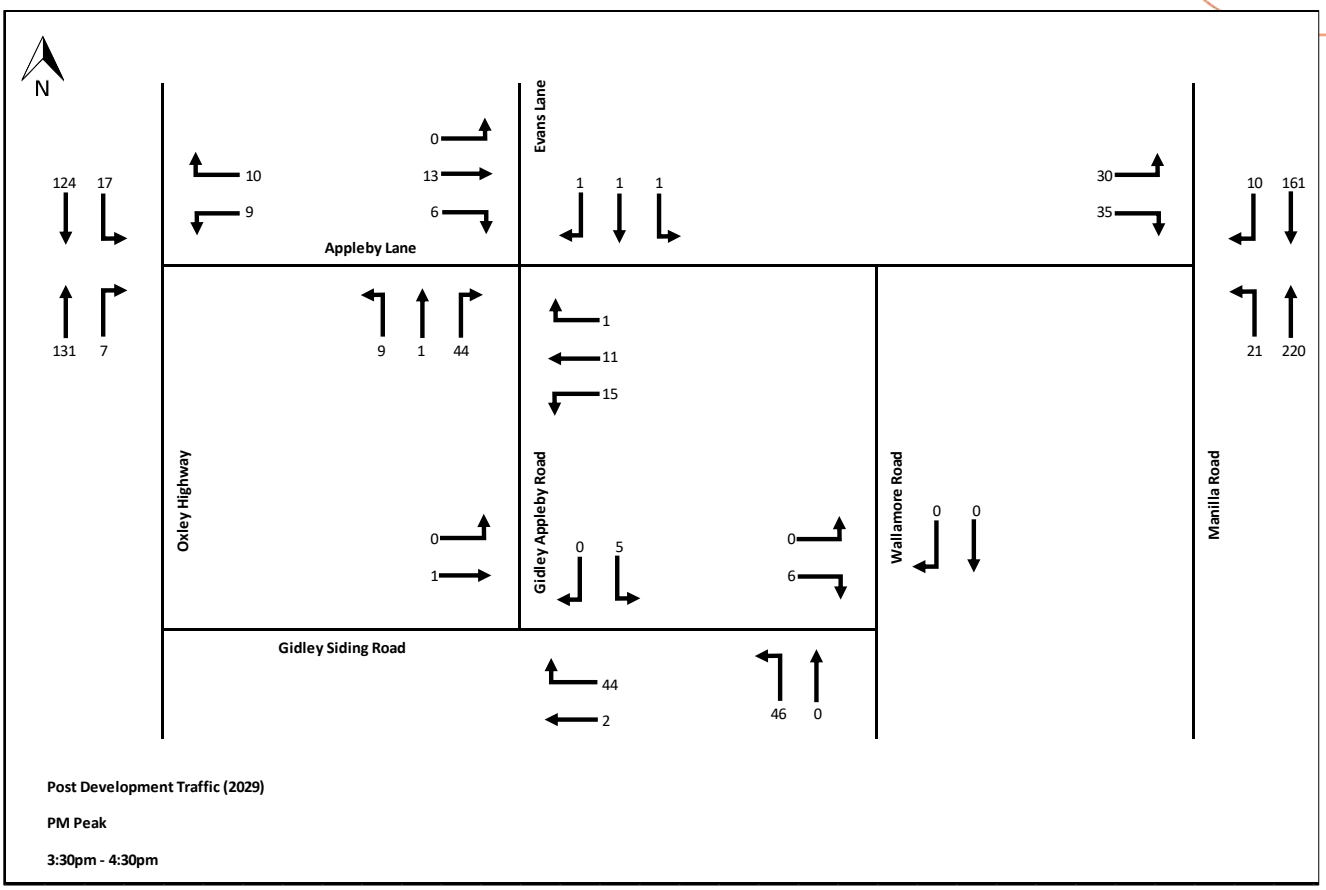

Figure 6-23 Full Development (2029) afternoon Peak Hour Traffic Volumes (Data Source: pitt&sherry, 2019)

The operation of the counted intersections in the post development (2029) scenario has been modelled using SIDRA Intersection traffic modelling software.

Figure 6-24 shows the additional traffic volumes expected from the development.

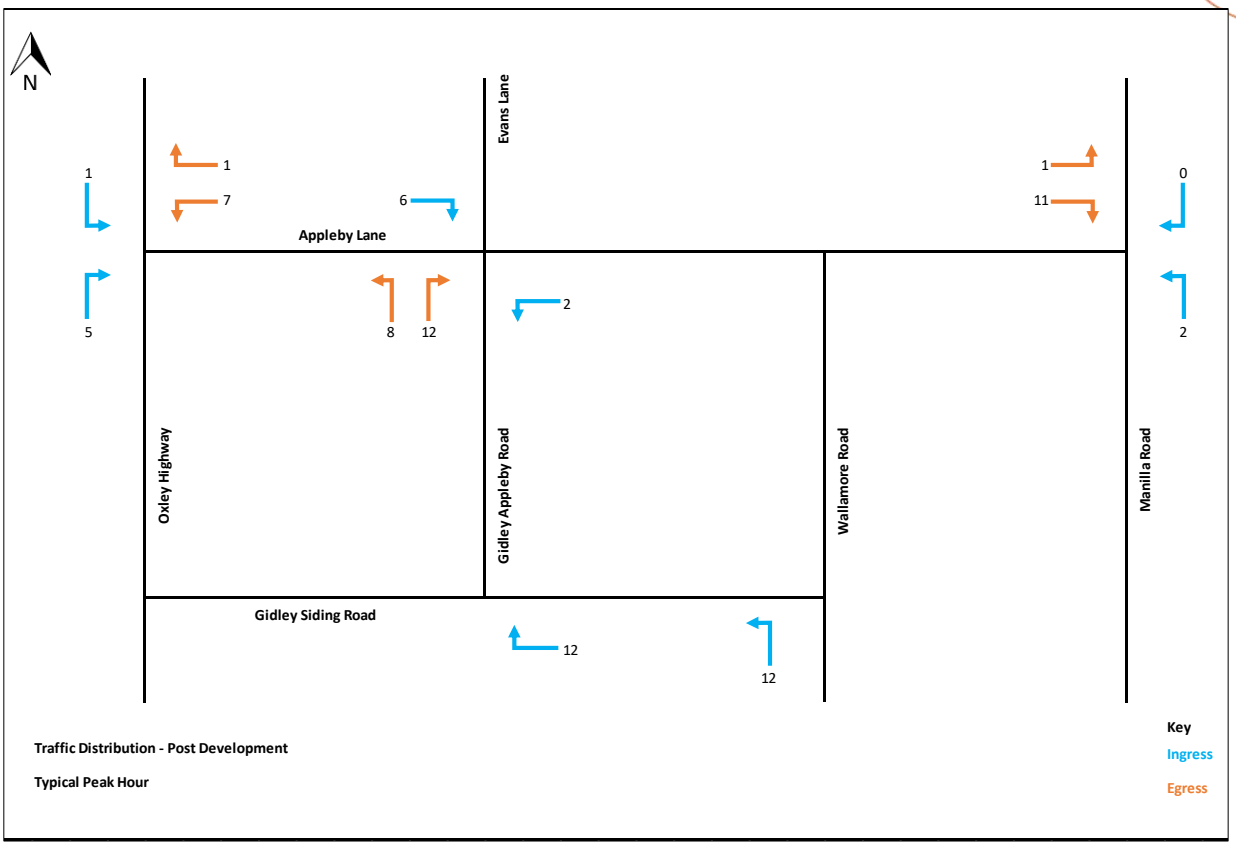

Figure 6-24 Full Development (2029) Additional Traffic Movements (Data Source: pitt&sherry, 2019)

Road upgrades and specifications

Minimum Lane width

As all roads proposed to be used as part of the development have a minimum lane width of 3.5m and a minimum shoulder width of 1.5m, the requirements of the NTC Guidelines are met.

Intersections

The Wallamore Road/ Gidley Siding Road intersection and the Gidley Siding Road/ Gidley Appleby Road intersection are both T-intersections while the Gidley Appleby Road/ Appleby Lane/ Evans Lane intersection is a 4-leg intersection. Each intersection operates with give-way control. However, currently there is no signage or line marking at these intersections resulting in confusion regarding priority at the intersections.

In order to resolve priority issues, give-way signage and line marking should be installed at the minor roads interface at these intersections.

Access Road

To enable vehicles to exit the Site safely, the internal access road should be sealed for approximately 30m back from the edge of Gidley Appleby Road in accordance to Austroads *Guide to Road Design Part 4: Intersections and Crossings – General (2017)*. This will allow suitable skid resistance for vehicles exiting onto Gidley Appleby Road and reduce the risk of loose gravel and mud from the Site being dragged onto Gidley Appleby Road.

Site Operation

The proposed development will have a maximum of 6 staff on-site between 7:45am and 5:00pm Monday to Sunday. There will be one shift per day.

The proposed ORF will be used by waste disposal contractors and is not open to the general public. The operating hours for the Site are 8:00am to 4:45pm Monday to Sunday.

While there are no pedestrian and cycling facilities along Oxley Highway and Manilla Road, school bus services do operate on these routes.

Vehicle Types

Several vehicle types will be used for the delivery and dispatch of organic materials. TRC have indicated that a combination of the vehicle types shown in Figure 6-25 would be used.

Figure 6-25 Vehicle Types Using the Facility (Data Source: Tamworth Regional Council, 2019)

Vehicle Type	Vehicle Length	Receivals/ Dispatch
Kerbside Collection Vehicle	6.5m and 10m	Receivals Only
Dual Axle Tipper	9m	Receivals and Dispatch
Semi-Trailer Tipper	15m	Receivals and Dispatch
Truck and Trailer Combination	18m	Receivals and Dispatch
Quad Dog and Trailer	20m	Dispatch Only
B- Double Truck	26m	Dispatch Only

6.3.4 Mitigation Measures

The Proposal will apply appropriate management measures as listed below to ensure any potential traffic impacts generated from the Proposal are minimised.

Table 6-25 Traffic Mitigation Measures

Ref	Mitigation measures
Construction mitigation measures	
T1	The ancillary road works (signage and access road) should be completed prior to the construction of the Proposal.
T2	Traffic management plans for construction shall be developed in accordance with Roads and Maritime Guidelines and the Australian Standard AS1742.3.
Operation mitigation measures	
T3	Traffic management plans for operation shall be developed in accordance with Roads and Maritime Guidelines and the Australian Standard AS1742.3.

6.4 Biodiversity

6.4.1 Introduction

A Flora and Fauna Assessment (FFA) was prepared by Eco Logical Australia (ELA) to describe the biodiversity present on the Site and assess the ecological impacts due to the Proposal.

The FFA was prepared in accordance with relevant NSW and Commonwealth legislation and is provided in **Appendix H**. A summary of the investigations and key findings of the FFIA is provided below.

6.4.2 Existing Environment

The Site has historically been used for cropping and grazing, with the area being mostly cleared and modified for pasture. There are sparse paddock trees and a few existing areas of remnant woodland located on the Site. ELA undertook a desktop assessment and a field survey of the Site.

Desktop assessment

A search of the Atlas of NSW Wildlife (NSW BioNet) was undertaken on the 3 July 2019 and identified two threatened fauna species and no threatened flora listed under the BC Act recorded within a 10 km radius of the subject Site; the Grey Headed Flying Fox (*Pteropus poliocephalus*) and the Koala (*Phascolarctos cinereus*). Both these species are also listed under the EPBC Act. Detailed assessments of the likelihood of occurrence of the species and communities are presented in **Appendix H**. Based on the likelihood of occurrence assessment, the Koala (*Phascolarctos cinereus*) was identified as potentially present within the study area.

A search of the Groundwater Dependent Ecosystems Atlas identified potential groundwater dependent ecosystems 700 m west of the Property along the Peel River (BOM 2017).

Survey Findings

A field survey of the study area (Lot 61 DP 707563) was undertaken by ELA on 4 June 2019 in accordance with the Biodiversity Assessment Method under the BC Act technique to determine:

- Flora and fauna species that occur within the study area;
- Vegetation communities that occur within the study area; and
- The likely impacts as a result of the works within the subject Site and ancillary works areas.

The surveys targeted potential threatened flora, fauna habitat (e.g. tree hollows and large woody debris), endangered populations and threatened ecological communities (TECs) listed under the BC Act and EPBC Act. Due to the degraded condition of vegetation within the study area, no targeted fauna surveys were undertaken.

No threatened flora or fauna species were observed during the field survey. No priority weeds listed under the North West Regional Strategic Weed Management Plan 2017-2022 were identified within the study area. The findings of the field survey are shown below in Figure 6-26.

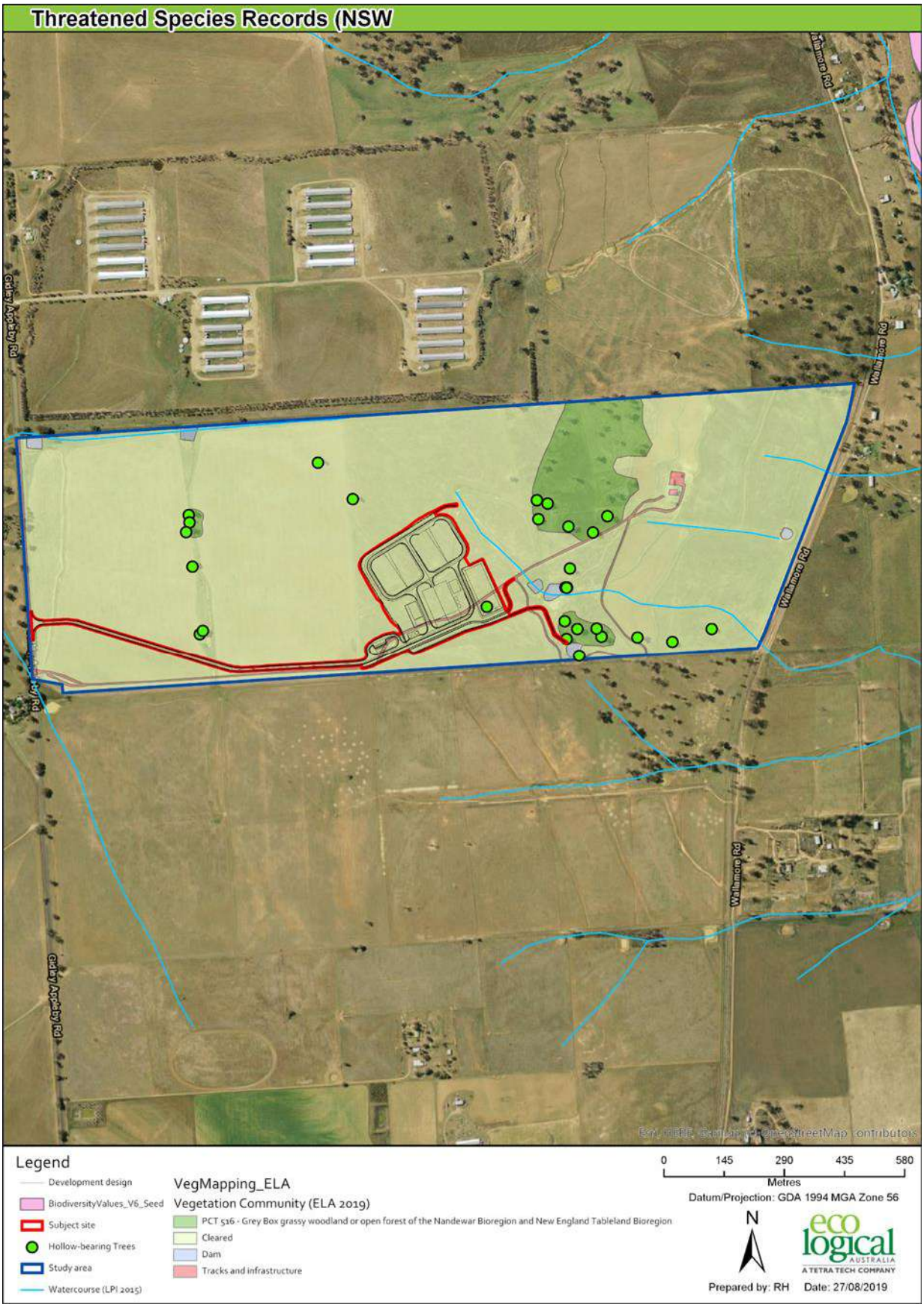

Figure 6-26 Vegetation identified in the study area (ELA 2019)

Grey Box grassy woodland (PCT 516) was found on-site. The PCT is an open woodland/grassland community, occupying approximately 7.91 ha of the study area. The canopy layer consists of one species (Eucalyptus mollucana or Grey Box) with 16 trees being identified as hollow bearing trees (HBT). The 7.91 ha of PCT 516 occurs within the study area, however the community is outside the development footprint and therefore will not be removed. PCT516 is not listed as a threatened ecological community under either the BC or EPBC Acts. A photo of the community on-site can be seen in Figure 6-27.

Figure 6-27 Remnant Grey Box grassy woodland (PCT 516) in south east section of the Site

The cleared vegetation community was identified throughout the remaining area of the study area in a highly degraded condition. This community occupies approximately 107.91 ha of the Site. The canopy consists of one tree species (Grey Box), which exist as sparse paddock trees throughout the area. Eight of the trees have been identified as HBTs.

6.4.3 Impact Assessment

Construction of the Proposal will require disturbance of the cultivated area located on-site including:

- Ground disturbance, including disturbance of up to 11 ha of the cleared vegetation community; and
- Removal of one HBT that is located within the development footprint.

Assessments in accordance with relevant legislation were applied to each species and ecological community identified as likely to occur or as having potential to occur within the study area (see **Appendix H**). A 'test of significance' under section 7.3 of the BC Act was undertaken for the Koala, which concluded it is unlikely that the proposal would result in a significant impact on the species. The proposal area provides habitat characteristics for the Koala in the form of secondary koala feed trees. However, given that all of these trees but one will be retained and that only the understory vegetation will be modified, the proposed works are not likely to affect the long-term survival of the species at the locality. The assessments concluded that the Proposal will not result in a significant impact on any species, populations, or ecologically communities listed under the BC Act or EPBC Act.

The Site has been used for agricultural purposes including grazing and crop production and is unlikely to contain threatened species, populations, or ecological communities. As such, the Proposal is not expected to significantly impact threatened species, populations, or ecological communities listed under the BC Act or EPBC Act.

The Proposal would not exceed the biodiversity offsets scheme (BOS) threshold outlined in Section 7 of the BC Act 2016 and Clause 7.1 of the Biodiversity Conservation Regulation 2017 as described below in Table 6-26. As the BOS thresholds were not triggered, a Flora and Fauna Assessment (**Appendix H**) was prepared to assess the impacts on biodiversity of the proposed development.

Table 6-26 BOS assessment

BOS trigger	Minimum threshold	Outcome
Area of native vegetation cleared	Minimum lot size is 100 ha therefore minimum threshold is more than 1 ha of vegetation.	Less than 1 ha of native vegetation cleared, therefore BOS not triggered.
Site mapped on Biodiversity Values (BV) Map	Any areas identified on BV map.	Site not identified on BV map, therefore BOS not triggered.
Significant impact to threatened species, populations, or ecological communities	Any significant impacts as described under 7.3 of the BC Act.	No significant impact, therefore BOS not triggered.
Impacts to Areas of Outstanding Biodiversity Value (AoBV)	The area is located within a registered AoBV.	No AoBV onsite, therefore BOS not triggered.

Should leachate be released from the Site it has the potential to:

- Contaminate groundwater resources and impact groundwater dependent ecosystem to the west; and
- Contaminate surface water including downstream flows including the Peel River which supports aquatic species.

Over use of the groundwater also has the potential impact groundwater dependent ecosystems. It is considered that the risk of these events occurring is low and can be avoided with appropriate management and mitigation measures as outlined within this EIS in section 6.9.

Operation of the proposed facility has the potential to impact the surrounding environment through the spread of weeds, seeds and plant pathogens or in the unlikely event of release of leachate or other contaminated surface water. A wheel wash will be provided on Site and a weed and pest management plan will be developed to manage weeds and animal pests on Ste.

The potential of the Proposal to increase the risk of birds striking aircraft was identified. The National Airports Safeguarding Framework: Guideline C (NASAG 2018) identifies organic waste and putrescible waste facilities as a high wildlife attraction risk and are considered incompatible within 3km of an airport, must be mitigated within 8km and monitored within 13km. The Site is located 10 km from the Tamworth Airport (YSTW) and therefore is required to be monitored. A wildlife hazard assessment has been completed by Avisure and can be found in **Appendix M**. The risk of bird strike and the identified mitigation measures is further addressed in Section 6.14.

The Proposal will represent a relatively small cumulative impact on potential habitat and is unlikely to have a significant impact on any threatened or migratory species. Mitigation measures are proposed reduce impacts to species and ecological communities within and adjacent to the Site.

6.4.4 Mitigation Measures

The Proposal will apply appropriate management and mitigation measures as listed in Table 6-27 below to ensure any potential biodiversity impacts are minimised.

Table 6-27 Biodiversity impacts mitigation Measures

Ref	Mitigation measures
Construction mitigation measures	
B1	During construction all staff and contractors should: • Operate only within the approved disturbance limits. • Avoid disturbing any native vegetation adjacent to the subject Site by clearly delineating vegetation to be retained. • If disturbance is required beyond the pre-determined extent a Site inspection shall be undertaken by a qualified ecologist to determine if any threatened flora or fauna or threatened species habitat may be impacted and to undertake appropriate additional impact assessments.
B2	Prepare and implement a Construction Environmental Management Plan which includes: • Strict erosion and sediment control measures in areas where disturbance is taking place, particularly around drainage lines. • Weed management. • Appropriate environmental controls to manage biodiversity during construction.
B3	To mitigate the impacts of fauna habitat removal, any clearing of habitat trees should be undertaken in the presence of a suitably qualified and trained ecologist to facilitate relocation of any fauna.
Operation mitigation measures	
B4	Prepare a pest and weed management plan (PWMP) to manage pest animals, reduce the spread of weeds and control weeds on-site and on soil stockpiles and adjacent roadways. The PWMP should include mitigation measures such as: the checking and cleaning of vehicles prior to entering and leaving the Site, as well as disposing of known weeds appropriately, and monitoring of birds and other animals and insects.
B5	Prepare and implement an Operational Environmental Management Plan to address operational activities which have the potential to impact on biodiversity including appropriate leachate management measures.

6.5 Aboriginal Cultural Heritage

6.5.1 Introduction

An Aboriginal Heritage Due Diligence Assessment (AHDD) was prepared by ELA to assess the potential for any impacts on Aboriginal cultural heritage associated with the Proposal. The ADDA is provided in **Appendix I**.

The AHDD was prepared in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010).

A brief summary of the assessment and key findings are summarised below.

6.5.2 Existing Environment

The Site is mostly cleared and is currently used for agricultural purposes including livestock and cropping. The proposed Site is located on very gently undulating land within the Red-Brown Earths soil landscape unit.

A desktop review of relevant state and local heritage registers was completed to assess the potential impacts of the Proposal on items of aboriginal heritage. No previous archaeological studies have been conducted within or in proximity to the study area.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) was conducted for the Site on 11 June 2019. The results of the search identified no aboriginal places within the study (*Figure 6-28)* area but found 89 aboriginal sites and aboriginal objects within 1km of the search area.

Searches of the Australian Heritage Database, the State Heritage Register (SHR), the State Heritage Inventory and the Tamworth LEP identified no items of Aboriginal significance.

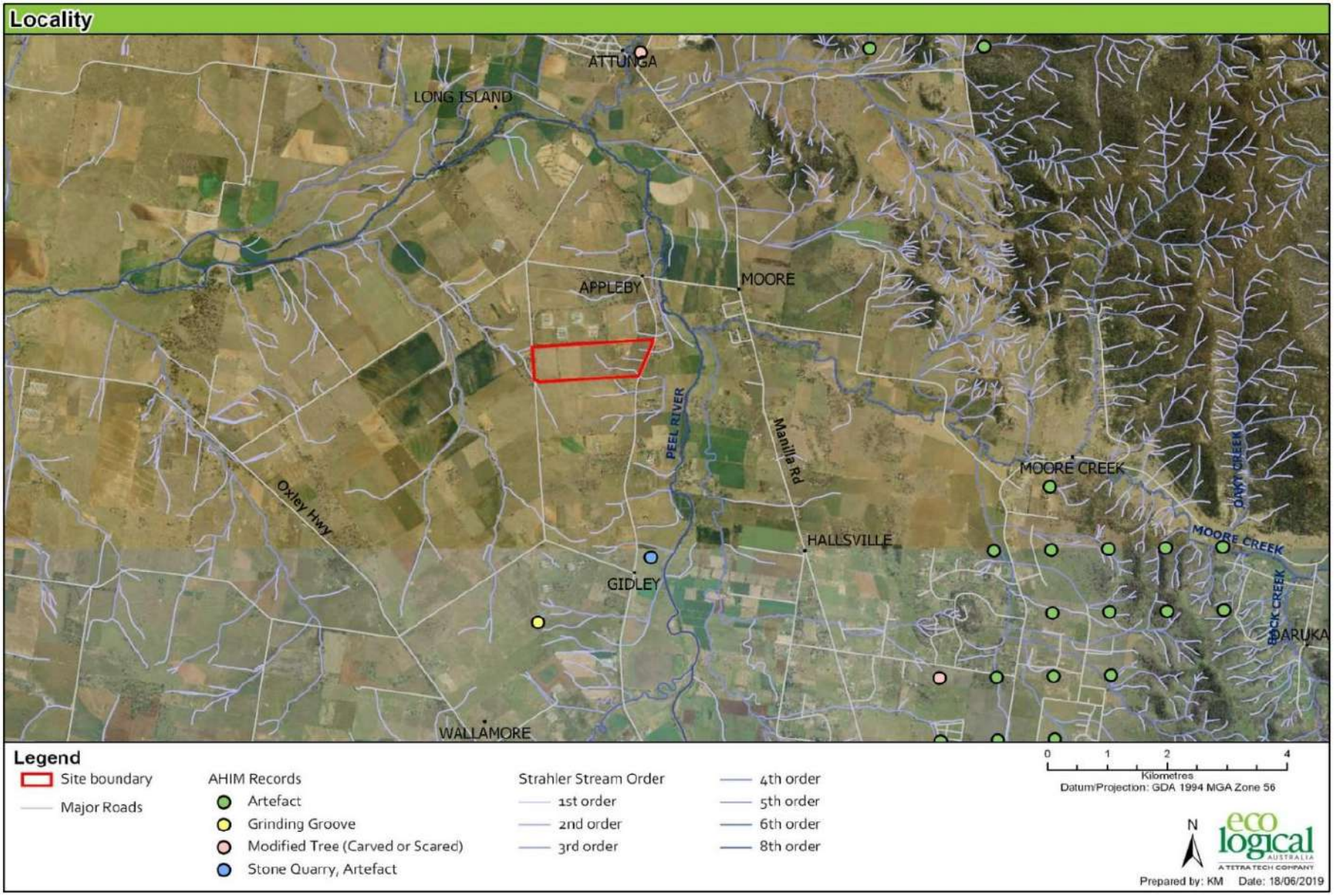

Figure 6-28 AHIMS registered sites in/within the vicinity of the study area, with hydrological features shown.

A visual inspection was undertaken of the Proposal Site by ELA archaeologist on 13 June 2019. A second inspection was carried out by ELA Archaeologist and Local Aboriginal Lands Council Representative on 23 August 2019. The purpose of the inspection was to verify the findings of the desktop review, to identify any previously unrecorded Aboriginal objects and to assess the archaeological potential of the study area.

The existing landscape shows high levels of disturbance due to agricultural activities, clearing, excavations, damming and earth stockpiling. The area of proposed works is not located within 200 m above or below a cliff face, within 20 m of or in a cave, rock shelter, on a ridgetop, headland, sand dune or in a cave mouth. The main waterway in the vicinity of the Site is the Peel River located approximately 700m to the east. Three highly modified and dammed first order streams are located within the eastern portion of the Site. Three first order ephemeral streams connecting to the Peel River outside of the Site are within 200 m of the Site boundary. The Site was observed to be highly disturbed with no landscape features suggestive of indigenous use and indicated a low archaeological potential. No artefacts were observed during the field survey.

Three artefacts were found during the second inspection and consist of two small fragmented cores (CC01 and CC02) and one flaked glass fragment (CG01). These artefacts were found near the disturbed ephemeral drainage line in the south east corner of the Site as shown in Figure 6-29, which is a relatively high point in the immediate local setting and thus the area of the Site most likely to contain artefacts. No other artefacts were found after a closer inspection of this drainage line.

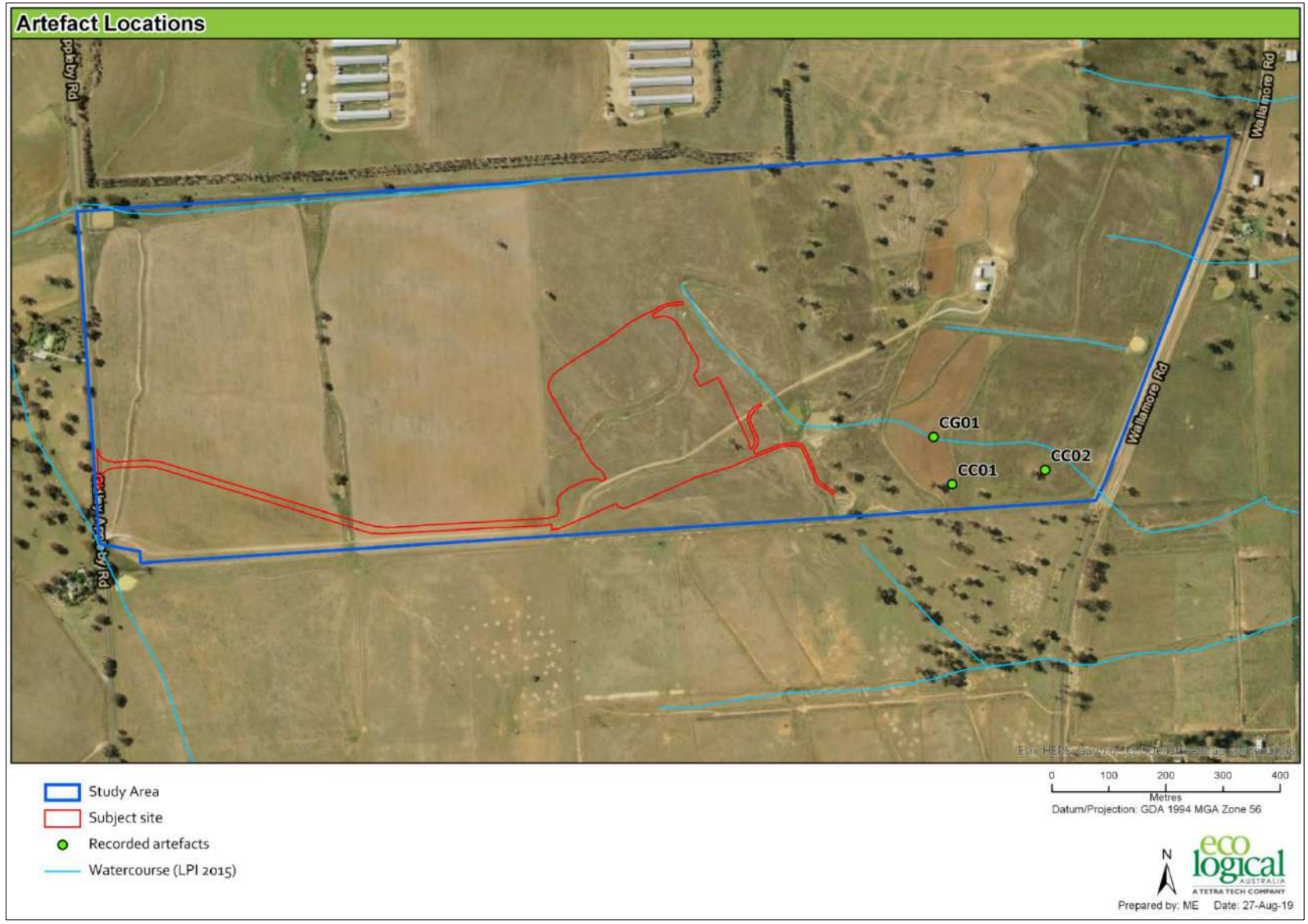

Figure 6-29 Location of identified artefacts from second Site inspection

6.5.3 Impact Assessment

The purpose of the Aboriginal heritage due diligence is to identify if there are registered Aboriginal sites and/or sensitive landscape features which may indicate the presence of Aboriginal sites and may therefore require further assessment and approval under Part 6 of the *National Parks and Wildlife Act 1974*.

The area of proposed works is not located within 200 m above or below a cliff face, within 20 m of or in a cave, rock shelter, on a ridgetop, headland, sand dune or in a cave mouth. Six 1st order ephemeral streams are located within 200 m of the Site, three of which are located within the Site boundary. These watercourses are not expected to have high archaeological potential given their ephemerality, location on highly disturbed and modified land, and high erosion potential. The lack of archaeologically sensitive landscape features indicates that the Site has a low archaeological potential. The existing landscape shows high levels of previous disturbance due to agricultural operations, previous clearing, excavations, damming and earth stockpiling. Three aboriginal objects were found during the survey however none of these are located within the subject Site and will therefore not be impacted.

The proposed works will not impact any known archaeological sites. Due to the existing highly disturbed condition of the Site and the lack of archaeologically sensitive landscape features there is low potential for an intact subsurface archaeological deposit to occur within the study area. It is therefore unlikely that any previously unrecorded Aboriginal sites or objects will be impacted by the Proposal. Further investigation in the form of an Aboriginal Cultural Assessment (ACHA) is not required.

6.5.4 Mitigation Measures

The Proposal will apply appropriate mitigation and measures to manage chance finds of aboriginal heritage as listed in Table 6-28 below to ensure any potential biodiversity impacts are minimised.

Table 6-28 Aboriginal cultural heritage mitigation measures

Ref	Mitigation measures
Construction	
AH1	A Chance Finds Protocol which addresses unexpected aboriginal heritage finds will be included in the Construction Environmental Management Plant to be completed by the construction contractor.
AH2	If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, the OEH must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approvals under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.
AH3	In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.
AH4	A Site visit with representatives of the TLALC should be conducted following Site preparation (i.e. removal of cover crop) and prior to significant ground disturbance.

6.6 Non-Aboriginal Heritage

6.6.1 Introduction

This section summarises the potential non-Aboriginal heritage impacts that may occur during the construction or operation of the Proposal. A qualitative non-Aboriginal heritage assessment was undertaken to determine the potential impact on all heritage-listed items and potential subsurface archaeology within and adjacent to the Proposal Site.

The following databases were searched on 28 June 2019 to identify heritage in the vicinity of the Proposal:

- Department of the Environment Australian Heritage Database
- Australian Heritage Places Inventory
- State Heritage Register
- State Heritage Inventory
- Tamworth Regional Council LEP Schedule 5
- Section 170 Heritage and Conservation Registers of the Roads and Maritime.

The results of the qualitative assessment are discussed in the following sections.

6.6.2 Existing Environment

The Site is in an area that has undergone significant transformation over the past two centuries. The built heritage in the region reflects the area's historical agricultural context. While the area is historically important, the existing built heritage is limited. There are no heritage listed items within 500 m of the Proposal and Table 6-29 identifies the listed heritage items identified within 1 km of the Site.

Table 6-29 and Figure 6-30 shows the location of the local built non-Aboriginal heritage (TRC LEP Schedule 5) items in proximity to the Proposal.

Table 6-29: Built non-Aboriginal heritage items

ID	Item and listing reference	Location	Approximate Distance from the Site	Significance
I001	Matilda Park	Appleby Lane Corner Lot 12, DP850174	760 metres from the Site boundary	Local (TRC LEP Schedule 5 Environmental Heritage)
I002	Silverweir	Appleby Lane Lots 1 and 2, DP 162586	500 metres from the Site boundary	Local (TRC LEP Schedule 5 Environmental Heritage)
I128	Former Hallsville Hall	Manilla Road Lot 48, DP 753851	850 metres from the SIte boundary	Local (TRC LEP Schedule 5 Environmental Heritage)

There are three items located within 1 km of the proposal area as identified in Table 6-29 above. All items are listed as local heritage items on the Tamworth LEP. The database search results found no State or Commonwealth listed items within close proximity to the Proposal.

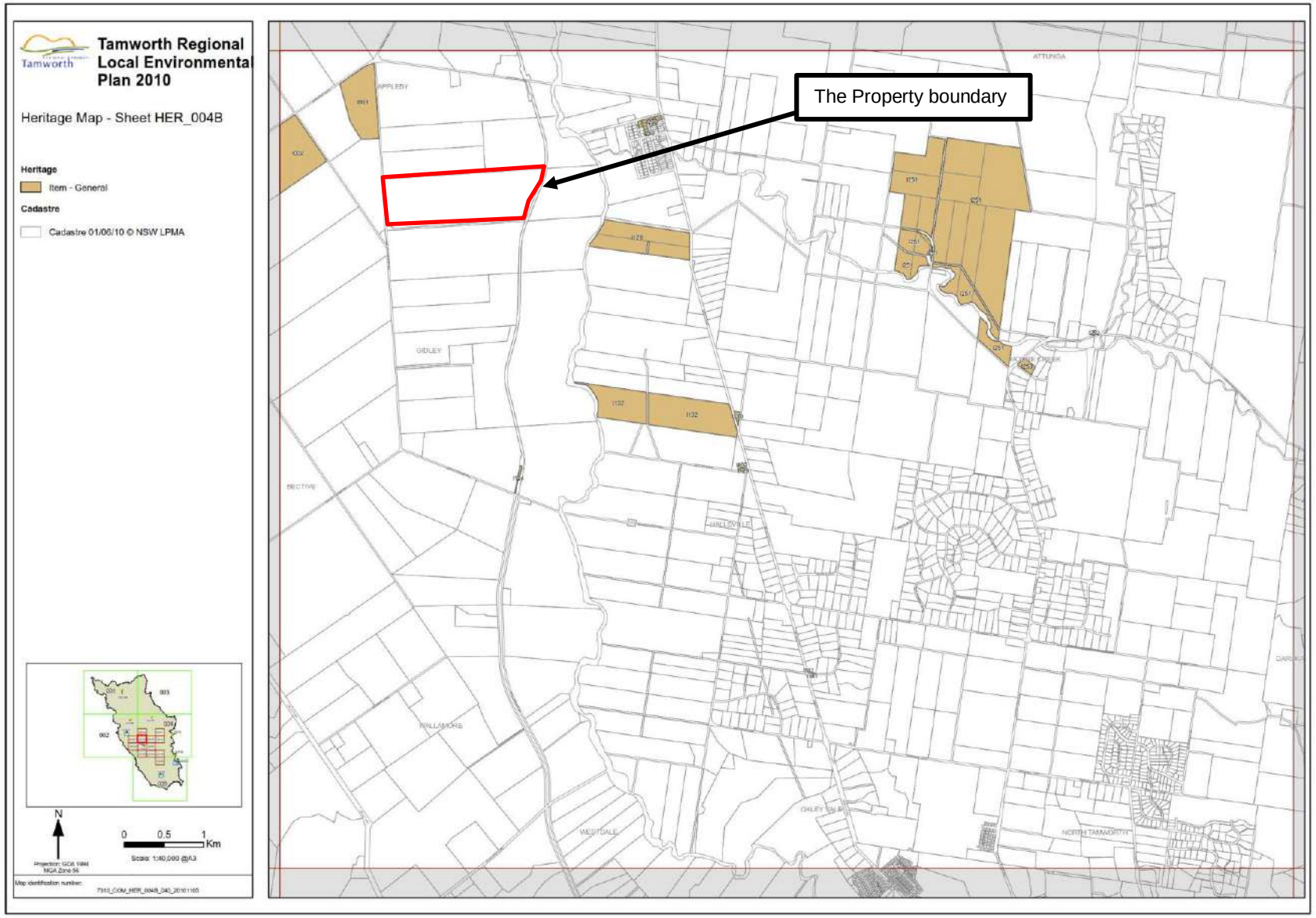

Figure 6-30 Local Heritage Map (Source: TRC LEP 2010)

A survey of the Site revealed no existing or relict structures or items of potential heritage significance within the Site. Historical aerial photographs of the Site from 2001 show cleared land with no evidence of any structures.

6.6.3 Impact Assessment

No items of heritage significance were identified within the vicinity of the Proposal or identified on-site; therefore, the Proposal is not expected to impact on any non-Aboriginal heritage values and there is no cumulative impact to Non-Aboriginal heritage in the area as a result of the Proposal.

6.6.4 Mitigation Measures

The Proposal will implement management and mitigation measures focused on the protection and management of any unexpected non-Aboriginal heritage finds as outlined below.

Table 6-30 Non-aboriginal heritage mitigation measures

Ref	Mitigation Measures
Construction Mitigation Measures	
H1	A Chance Finds Protocol which addresses unexpected non-Aboriginal heritage finds will be included in the Construction Environmental Management Plan to be completed by the construction contractor.
H2	If an item (or suspected item) of heritage is discovered during construction, all work in the area of the find will cease immediately and the Chance Finds Protocol implemented including notifying an officer from the Heritage branch of OEH immediately and seeking advice for management of the object.

6.7 Soils and geology

6.7.1 Introduction

To assess the potential impacts of the Proposal on soils and geology a desktop review was undertaken to gather published regional soils details. To collect Site specific information on soils, geology and geotechnical properties a geotechnical investigation was undertaken by Regional Geotechnical Solutions and the results outlined in the geotechnical report presented at **Appendix J**).

A summary of the investigations and assessment of potential impacts to soils and geology is provided in this section.

6.7.2 Existing Environment

Geology

The 1:100,000 Manilla Geology Map indicates that the Site is underlain by residual soil that overlies weathered mudstone, sandstone and shale. Major geological structures occur locally including the Attunga Fault several kilometres east of the Site, and the Manilla Fault several kilometres west of the Site.

A geotechnical investigation of the Site was undertaken by Regional Geotechnical Solutions. Fieldwork for the assessment was undertaken by East West on 17 June 2019 and comprised the following:

- A general walkover and observation of the site conditions;
- The excavation of five test pits (TP1 to TP5) across the site with a small excavator; and
- Collection of samples for laboratory analysis.

A summary of the subsurface materials encountered in the five test pits is provided in Figure 6-31.

Figure 6-31 Summary of Subsurface Materials

Material name	Material description	Depth of base material layer (m)				
		TP1	TP2	TP3	TP4	TP5
Topsoil	SILT, low plasticity, brown	0.15	0.5.	0.1	0.1	0.15
Residual Soil	CLAY and Gravelly CLAY, medium plasticity, very stiff to hard	--	0.9	0.4	0.35	0.5
XW Siltstone	Extremely weathered, very low strength	0.8	1.3	1.1	0.8	--
DW Siltstone	Distinctly weathered, very low to low strength	≥ 1.3*	≥ 1.4*	≥ 1.4*	≥ 1.1*	≥ 0.6*

Note: ≥ Indicates that base of material layer was not encountered
** indicates that the test was terminated due to practical excavator refusal*
-- Indicates that the material was not encountered at the test location

No groundwater was encountered and no evidence of temporary groundwater inundation (e.g. mottling) was observed. The maximum depth of test pitting was 1.4m.

The geotechnical report outlines a range of information relevant to the detailed design of the Proposal including the results of laboratory testing of geotechnical properties. In summary, the report indicates the following main geotechnical challenges for the proposed development and earthworks at this Site include:

- Moderately reactive, moisture sensitive clay soils;
- Shallow weathered rock profile; and
- Low natural cross falls with resulting poor drainage conditions.

Soil Landscape

The Site is not covered by any published soil landscape mapping, though is close to the northern boundary of the Tamworth 1:100,000 Soil Landscape Map (Banks, 2001). By extrapolation from the Tamworth Soil Landscape Map it is likely that soils at the Site are similar to those described form the Duri Soil Landscape on the Tamworth Sheet.

The Duri Soil Landscape is characterised by undulating to rolling low hills on Devonian and Carboniferous sedimentary rocks, with local relief <100m (commonly <60m) and slopes <10%. It contains mostly cleared open woodland and grassland used for agriculture.

The soils of the Duri Soil Landscape are extremely complex due to rapid changes in underlying lithology but are generally dominated by duplex (texture contrast) soils such as moderately deep, moderately well drained Red and Brown Chromosols (Banks, 2001). Typical qualities and limitations of this landscape broadly, though are not necessarily evident on the Site, include:

- Localised poor drainage, high groundwater tables and seasonal waterlogging;
- Localised groundwater recharge and discharge area;
- Localised engineering hazard;
- Localised shallow soils;
- Erosion risk (gully, sheet and wind); and
- Complex soils with localised low wet strength, stoniness, sodicity, structural decline, erodibility, hard setting surfaces and low permeability.

The Proposal Area has historically been highly disturbed and cultivated for agriculture and related rural land management activities including construction of soil conservation works such as contour banks, dams and construction of existing roads. These activities will have disturbed the natural soils to varying degrees.

The five test pits undertaken for the geotechnical survey encountered a residual soil profile with generally shallow silty topsoil over clay subsoils (Clay and gravelly Clay, medium placidity, very stiff to hard) that grades into weathered siltstone at depths of between 0.35 and 0.9m.

Soil Erodibility and Erosion Hazard

Walkover investigations identified some areas of localised sheet erosion on the subject property particularly in areas where soils have been disturbed previously and where water flow is concentrated. Areas displaying erosion include on contour banks, in constructed waterways and the internal batters of dams. The level of erosion observed is typical of rural properties in the area, affects only a small area of the property and does not suggest any underlying major erosion hazard.

Emerson Aggregate tests were performance on two samples as part of the geotechnical investigation. The results indicated the soils are Emerson Class 5, which indicates they present a relatively low risk of dispersion.

The overall water erosion hazard at the Site was considered in line with the process outlined in Managing Urban Stormwater: Soils and Construction (Landcom 2004; the “Blue Book”). The Blue Book outlines a process for assessing erosion hazard using the Revised Universal Soil Loss Equation (RUSLE), and additionally describes a simpler process to identify sites of low erosion hazard based on the site’s rainfall erosivity factor (R-Factor, a climate factor which assesses the likelihood of damaging, high intensity rainfall occurring during construction) and slope (erosion hazard increases with increasing landform slope. The Proposal Site has low slopes (typically around 5%) and a relatively low R-factor of around 1500, and with reference to Figure 4.6 in the Blue Book can be considered low erosion hazard. The Blue Book indicates that on low erosion hazard sites, a normal suite of erosion and sediment control measures as outlined in the Blue Book, can be considered adequate.

Acid Sulphate Soils

The Proposal Area does not contain the requisite conditions for formation of potential acid sulphate soils. These typically occur in low lying, waterlogged, coastal estuarine environments where soils have been formed in the presence of seawater. The Site contains residual soils that are not regularly waterlogged and are not expected to contain oxidisable sulfide minerals. It is extremely unlikely that acid sulphate soils occur within the vicinity of the Site. The risk of acid sulfate soils is not considered further.

Salinity

The field investigation did not test for salinity and no data for salinity was available in the immediate vicinity of the Site. During the site inspection, no indicators of soil salinity such as salt-scalded bare patches, stressed plants, patches of salt tolerant plants, change in crop health, or white crusts on soil surface were identified. Salinity is not expected to pose a constraint for the Proposal.

Contaminated Land

A walkover survey of the Site did not observe any evidence of contamination, such as soil staining or vegetation dieback. During geotechnical investigations of five test pits across the Site no visual or odour indicators of contamination were identified. No targeted soil testing for contamination has been undertaken.

A desktop review of the potential for contamination to be present on the Site was undertaken. Historic records do not suggest a high risk of contaminating activities located on or adjacent to the Site. The previous and ongoing agricultural use of the Site is likely to have included use of herbicides and pesticides and other farm chemicals. Inappropriate storage and use of farm chemicals can cause contamination of the soil with organochloride compounds. Localised contamination can occur particularly in locations where chemicals are stored and mixed. Hydrocarbon contamination can occur in association with above-ground and underground fuel storage tanks. There is no evidence of these activities occurring within the Proposal Area.

A search of the NSW EPA Contaminated Land Record was completed on 2 September 2019 which identified no records of contaminated land within the vicinity of the Proposal. Only two records exist for the Tamworth LGA – the Tamworth Coles Express in South Tamworth and the Woolomin Gold Rush Store in Woolomin. Both sites are more than 5km from the Proposal Site.

6.7.3 Impact Assessment

Construction

Construction of the proposal will include a range of activities that will disturb soils including:

- Vegetation removal (mainly grasses) and topsoil stripping;
- Bulk earthworks to create final levels for building platforms and operational areas;
- Importation and compaction of hardstand materials;
- Excavation of drainage structures and construction of dams;
- Trenching for services installation;
- Road works;
- Stockpiling; and
- Use of temporary unsealed access roads.

Construction activities remove the protective vegetation layer that protects the soil surface and exposes soils to potential accelerated erosion during rainfall, and generation of sediment laden stormwater runoff. Sediment-laden runoff from construction-sites can carry a range of pollutants such as sediment, organic matter and nutrients, which can impact the quality of receiving waters. Earthworks and vehicle traffic has the potential to degrade the quality of soils through topsoil loss and structural decline. Appropriate erosion and sediment controls would be installed to manage these risks and minimise the risk of environmental harm.

The overall Site erosion hazard is low based on factors including the low Site gradient (typically <5%) and the low rainfall erosivity. The erosion hazard increases along drains and other areas conveying concentrated stormwater flows, and on steep slopes such as stockpiles, cut and fill batters. A standard suite of erosion and sediment controls would be effective in managing erosion and sedimentation risks at the Site during construction, with some additional focus on specialised techniques to stabilise areas of higher erosion hazard (drains etc.). It is recommended that a Soil and Water Management Plan (SWMP) be prepared for construction in accordance with the Blue Book and implemented prior to disturbance activities commencing. Appropriate erosion and sediment controls are likely to include, but not limited to:

- Stabilised site entrance to prevent tracking of sediment onto public roads;
- Diversion of clean water around disturbance areas;
- Barrier fence or similar to define and limit the area disturbed by construction and protect exclusion areas such as riparian buffers and tree protection zones;
- Sediment controls such as sediment fence installed downslope of disturbance areas and stockpiles;
- Drainage structures designed to convey stormwater flow in a non-erosive manner; and
- Progressive and prompt rehabilitation and stabilisation of all areas post construction.

Construction activities also have the potential to generate dust, which can cause air quality and amenity impacts. The risks of dust generation are not unusual or excessive at this Site and can be managed using techniques such as watering of loose materials and unsealed haul roads and controlling activities that generate dust during hot and windy weather. These matters would be addressed in the Construction Environmental Management Plan. The potential to generate dust is further addressed in Section 6.1.

Accidental spills or leaks of fuels and oils from construction plant and equipment can occur and could lead to contamination of soil and groundwater. These risks can be managed using appropriate containment and clean up techniques.

Operation

As described in the Preliminary Engineering Design, once in operation the Site will contain a variety of hardstand areas and landscaping (see **Appendix D**). Hardstands constructed of road base and similar materials do have potential to erode and generate sediment, though risks will be reduced by using appropriate materials in construction and by maintaining hardstand surfaces when required. The largest hardstands are associated with the maturation pads. Runoff from these areas is managed as leachate and directed to the lined leachate ponds, which will provide effective capture of sediment and other contaminants contained in stormwater runoff.

During operations, the most significant potential source of contamination to soils is leachate from organic materials. All leachate runoff generated by the Proposal will drain to a Leachate dam which will be lined with a clay or modified soil liner consistent with the requirements of the NSW EPA Guidelines. All areas capable of generating leachate and conveying leachate water will also be lined to prevent leachate from impacting soils and groundwater beneath and surrounding the operational surfaces. These design features, that are consistent with the relevant NSW EPA guidelines, will be effective in minimising the risk of leachate impacting soils.

Implementation of appropriate mitigation measures during construction and operation will reduce the potential for significant impacts from the Proposal.

6.7.4 Mitigation Measures

The Proposal will implement management and mitigation measures to manage potential soil and geology impacts as outlined in Table 6-31.

Table 6-31 Soils and geology mitigation measures

Ref	Mitigation measures
Construction	
S1	Prepare and implement a Soil and Water Management Plan for construction, which includes appropriate erosion and sediment controls in accordance with Managing urban stormwater: soils and construction, Vol. 1 and 2 (Landcom, 2004). At a minimum, the erosion and sediment plan should address: • Measures to minimise soil disturbance; • Management of stormwater, including diversion of clean stormwater around disturbance areas and collection of dirty runoff into appropriate sediment traps; • Management of stockpiles; • Temporary erosion controls to be employed in high erosion hazard areas such as stormwater drains and steep batters; • Specific measures to stabilise surfaces conveying concentrated water flows, to control erosion; • Installation of appropriately designed and sized sediment controls downslope of disturbed areas to prevent sediment-laden runoff; • Sediment basin requirements; • Measures to control dust generation; • Progressive stabilisation and rehabilitation of disturbed areas following completion of construction; and • Regular inspection and maintenance of erosion and sediment control measures.
S2	Ensure that any imported fill free from contamination and weed seeds or propagules.
S3	Prepare and implement a Spill Prevention and Response Procedure to address accidental spills and leaks from machinery and vehicles.
S4	Incorporate sediment, stormwater, leachate and dust control measures into the design of the facility including: • Appropriate stormwater management infrastructure; • Stabilising soil surfaces disturbed by construction, through landscaping or sealing; • Appropriate sealing of all areas generating, conveying or storing leachate waters, to prevent contamination of underlying soils and groundwater; and • Hardstand pavements for trafficable areas of the Site
Operation	
S5	Prepare and implement an Operational Environmental Management Plan which provides erosion and sediment controls, stormwater and sediment runoff controls, chemical and machinery storage and management and dust controls.
S6	Operational Environmental Management Plan is to includes the following plans and procedures at a minimum to control and prevent soils related impacts:

Ref	Mitigation measures
	• Leachate Management Plan; • Stormwater Management Plan; • Spill Prevention and Response Plan; • Machinery Maintenance Procedures; and • Dust control procedure.

6.8 Surface Water Hydrology and Storm Water Management

6.8.1 Introduction

This chapter describes the existing and proposed surface water conditions on the Site. Information is sourced from desktop research, topographical maps and on-site investigations.

A water balance was prepared by pitt&sherry (**Appendix N**), which identifies areas of stormwater collection, storage and reuse in the proposed facility.

A summary of these investigations and key findings is provided below.

6.8.2 Existing Environment

Site Drainage

The proposed facility lies approximately 1km west of Peel River, which is classified as a 4th order or higher stream and flows into the Namoi River approximately 46km downstream to the west. The Namoi River flows into the Barwon River at Walgett, which becomes the Darling River approximately 150km downstream. Thus, the Peel River forms part of the Murray-Darling River System.

The topography of the proposed development Site (refer Figure 6-32) is characterised by a low ridge with gentle side slopes that drain in two main directions. The eastern portion of the Site grades in an easterly direction towards Gidley Appleby Road with slopes generally less than 5% from the highest point on the Site. The western portion of the Site grades towards Wallamore Road.

The proposed development Site has been historically cleared for agriculture and this has affected natural drainage patterns and hydrology. Native vegetation has been substantially cleared and the Site contains predominantly pasture grasses, reflecting the current land use of stock grazing. Several first order watercourses are depicted on the topographic map describing the development Site. The topographic map does not accurately depict site drainage patterns which have been altered from the natural condition due to the past construction of many contour banks, constructed waterways and dams which can be seen clearly in the aerial photo of the Site (refer Figure 6-33). The Site does not contain any appreciable riparian habitat. The constructed drainage systems comprise earth swales and channels vegetated with pasture grasses which flow only intermittently in response to significant rainfall. These watercourses do not display natural geomorphic watercourse features, such as bed and banks with areas of erosion and sediment deposition. They are grassed open depressions with no permanent water.

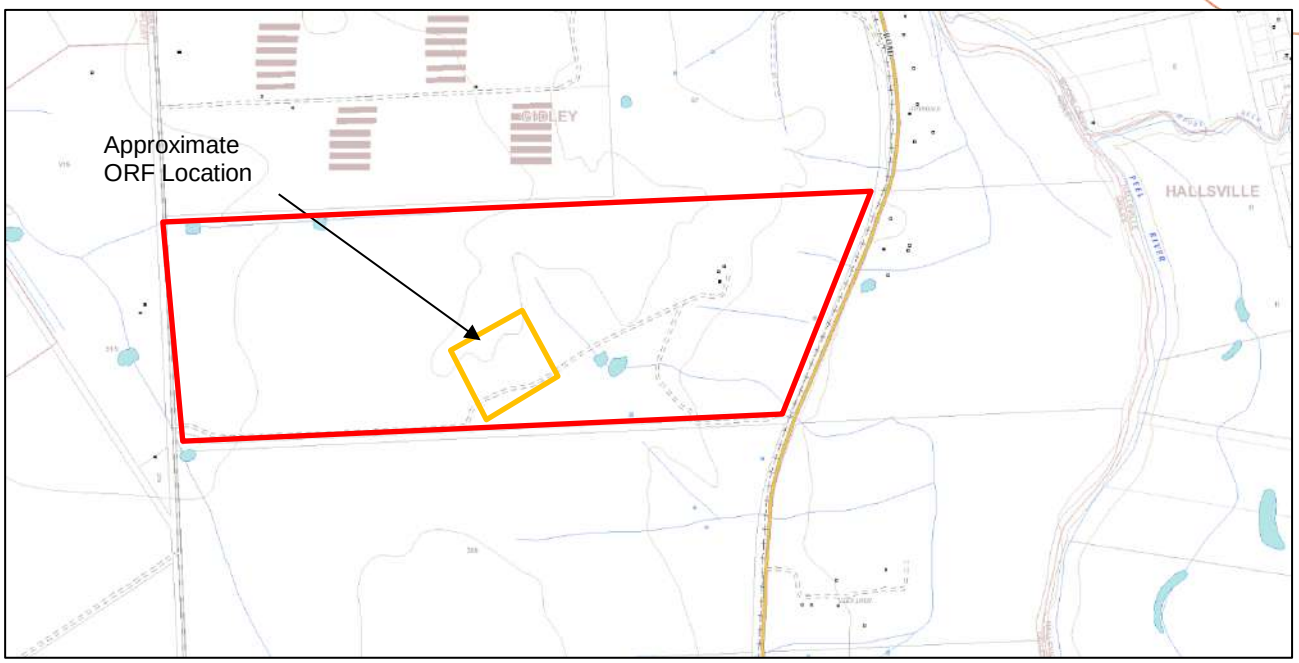

Figure 6-32 Topographic Map of the Site (Source: Six Maps)

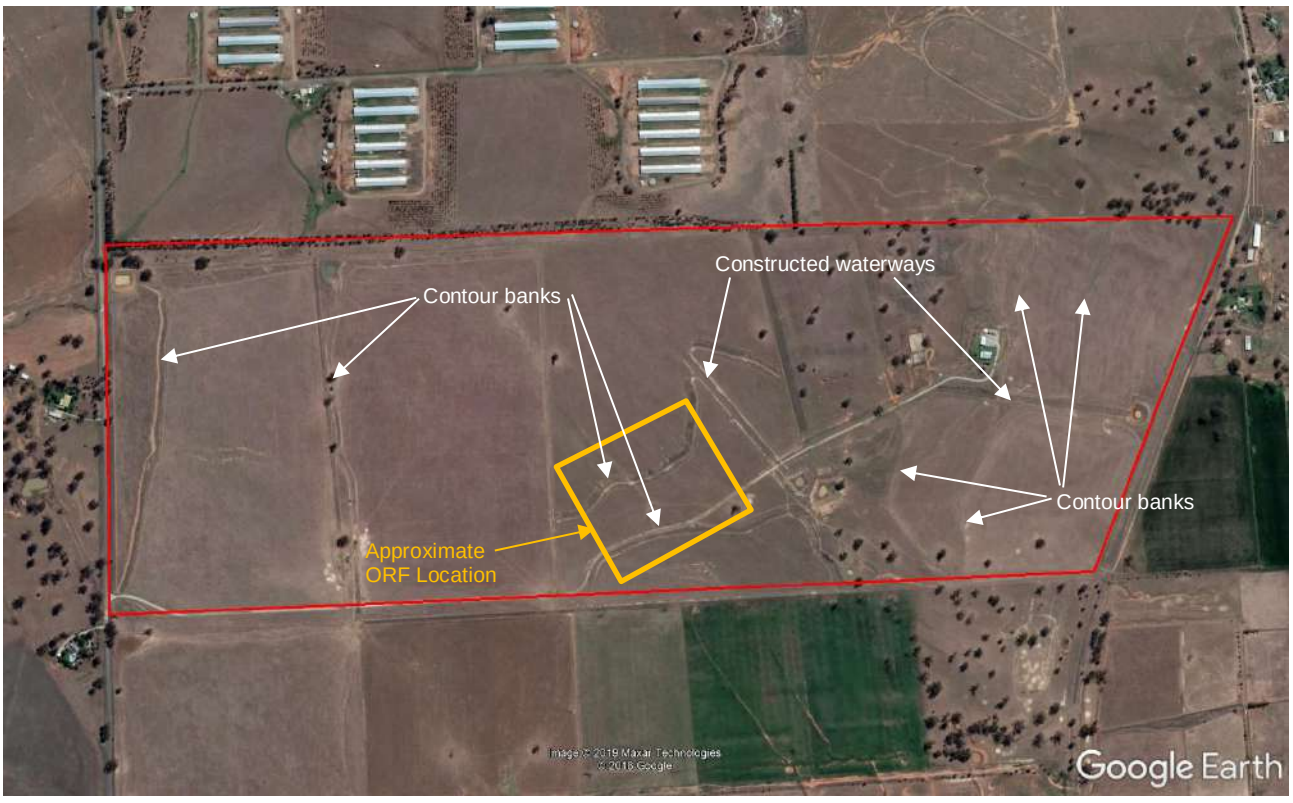

Figure 6-33 Aerial photo showing constructed drainage systems and soil conservation works (Source: Google Earth)

A site inspection was undertaken on 3 June 2019 and while approximately 12mm of rain fell on this day (rain data from Tamworth Airport AWS) the long-term weather pattern had been extremely dry with below average rainfall in preceding months. The small volume of rainfall during the site inspection did not reveal any ponding on-site or significant runoff.

Flooding

The Proposal is not located within a flood planning area as identified in the Tamworth LEP (2010). Flood mapping supplied by TRC indicates the Proposal is outside of the 1% AEP flood event, as illustrated in Figure 6-34.

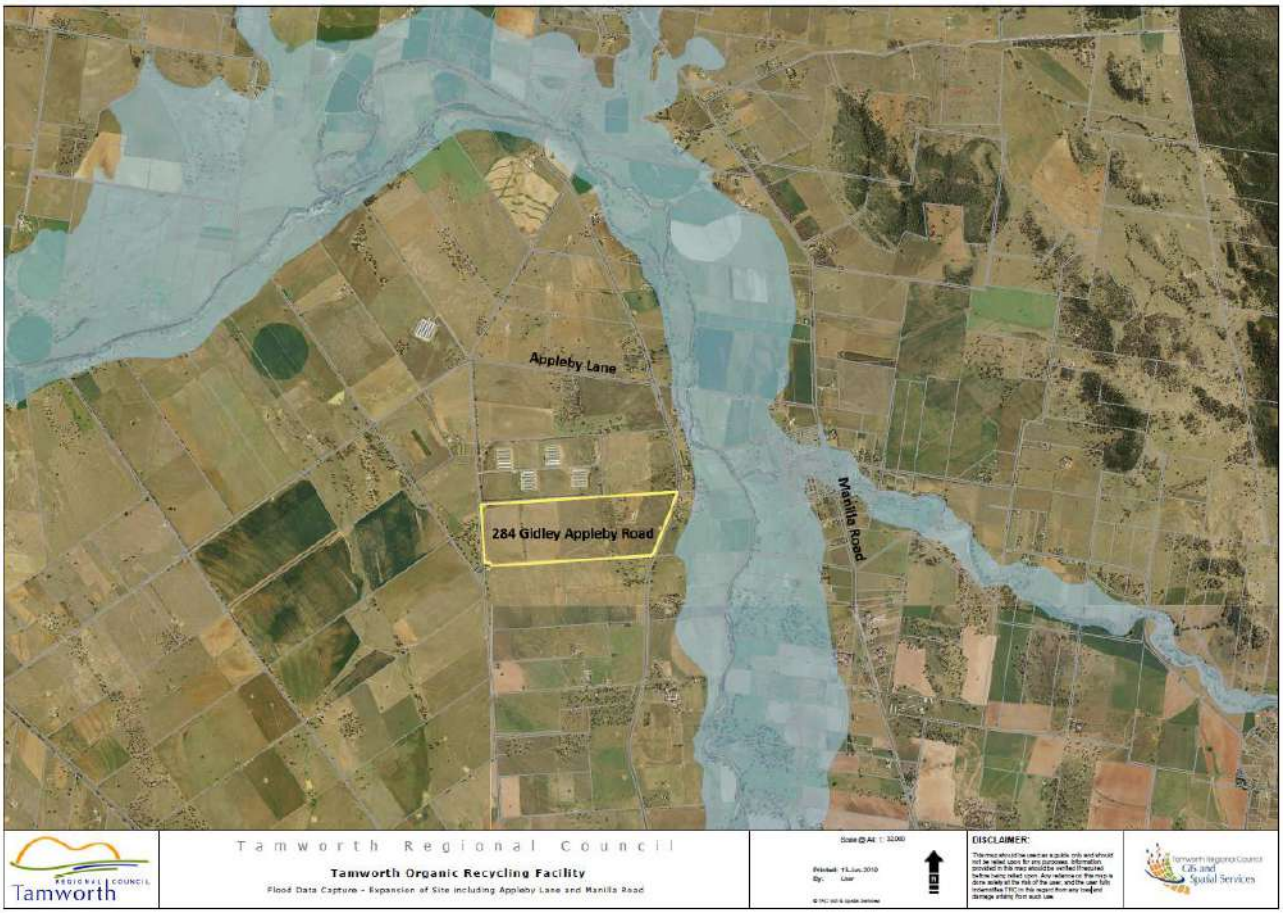

Figure 6-34 Tamworth Regional Council regional flood map (Source: Tamworth Regional Council LEP 2010)

Flood affected land associated with the Peel River floodplain occurs to the east of the Proposal. The maximum extent of the 1% AEP flood comes to within approximately 200m of the east of the Proposal Site (refer Figure 6-35). The elevation of the proposed ORF is at approximately 374m AHD, and above, whereas the 1% AEP flood level east of the Site, is at about 355m AHD, approximately 20m lower than the proposed ORF.

There is no plausible risk of the Proposal Site being affected by flooding from the Peel River. Furthermore, the Proposal Site sits high within a very small stormwater drainage catchment (approximately 15-20 hectares), with only minor first-order watercourses and constructed drains nearby. Stormwater would be diverted around the Site to ensure it is not affected by flooding from localised stormwater runoff.

On the basis of this information, pitt&sherry wrote to DPIE (Biodiversity and Conservation Division) on 4 July 2019 in relation to the SEARs related to flood impact assessment. It is pitt&sherry's view that the requirements for flood modelling under Section 7 Flooding of Attachment A in OEH's Recommended Environmental Assessment Requirements (EARs) for Composting Facility – 284 Gidley Appleby Road are not applicable due to the very low risk of flooding. DPIE confirmed by reply letter dated 11 July 2019, that a qualitative assessment of potential impacts was acceptable. Flood modelling has not been undertaken and is not required. Correspondence from OEH confirming flood modelling is not required can be found in Appendix C.

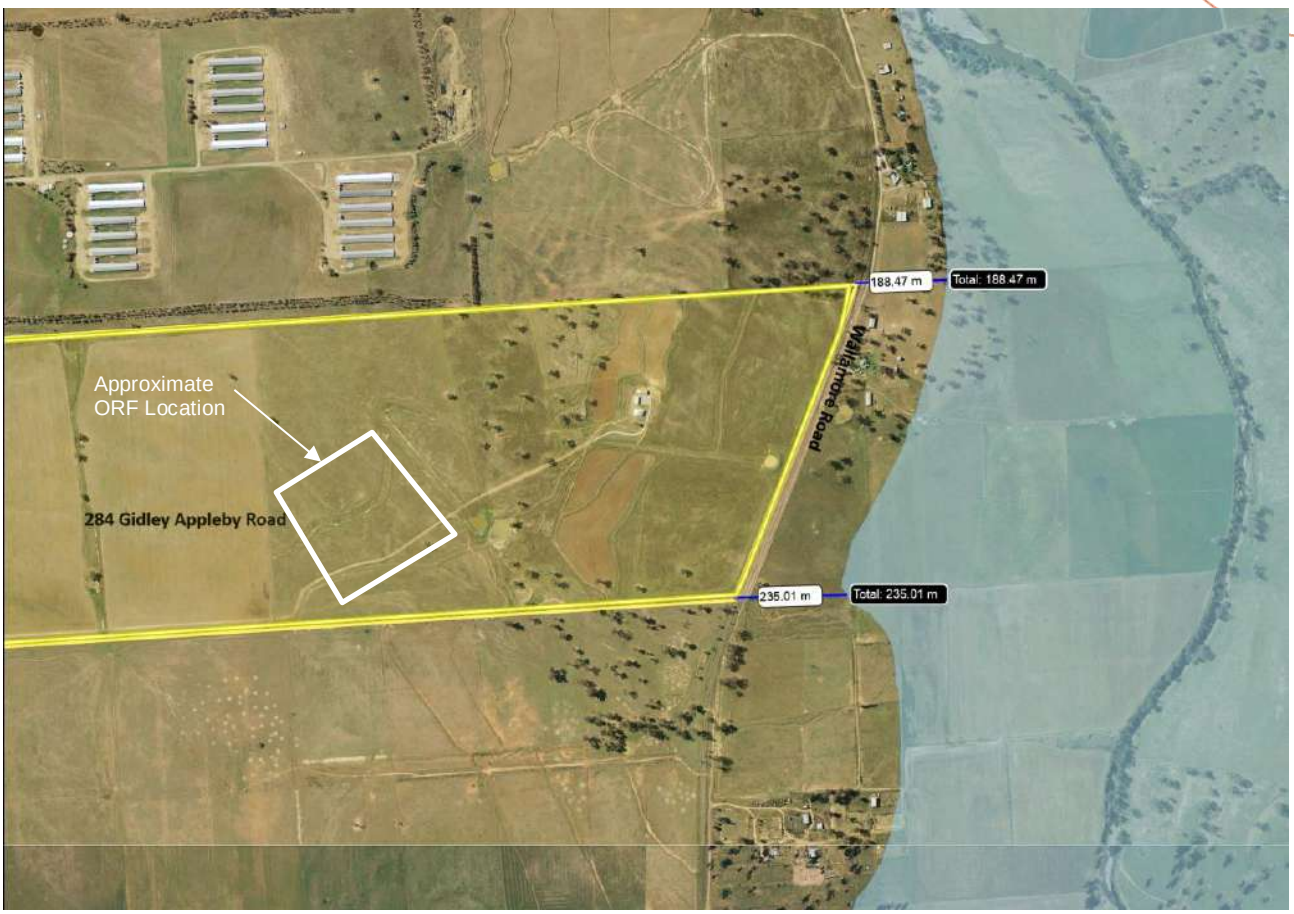

Figure 6-35 Flood detail near the Site (Source: Tamworth Regional Council LEP 2010)

Water sharing and harvestable rights

The applicable Water Sharing Plan for the Proposal is the Peel Valley Regulated, Unregulated, Alluvium and Fractured Rock Water Sources. The plan includes rules for protecting the environment, water extractions, managing licence holders' water accounts, and water trading in the plan area.

Harvestable rights establish the maximum capacity of unlicensed dams that a landowner may establish on their property and are calculated as 10% of the estimated average annual runoff from the property. Some types of dams are exempted from harvestable rights rules. Schedule 2 of the Harvestable Rights Order published in accordance with Section 54 of the Water Management Act 2000 lists the classes of dams exempt from the operation of paragraph 3 of the Order. These include Dams solely for the capture, containment and recirculation of drainage and / or effluent, consistent with best management practice or required by a Government agency or Local Government Council to prevent the contamination of a water source. The proposed leachate dam is exempted from the harvestable rights allowance. The proposed facility will use rainwater supplied from captured water from the Site sheds and office blocks, which would also be exempted. All clean water dams on-site would need to be considered in the Harvestable Rights calculations.

The Maximum Harvestable Rights Dam Capacity (MHRDC) for the approximately 117 hectare property on which the proposed ORF is located, is currently 8.638 mega litres (ML). This is the maximum amount Tamworth Regional Council will be able to store in clean water dams on-site and any additional capacity would need to be licensed. Table 6-32 shows the estimated capacities of the existing dams on-site.

Table 6-32: Existing dam volume calculations (Source: Six Maps 2019).

Dam reference	Location within the lot	Estimated surface area (m^2)	Average depth (m)	Total Volume – megalitres (ML)
Dam 1	North west	1052	1.5	1.578
Dam 2	North east	848	1.5	1.272
Dam 3	South west	882	1.5	1.323
Dam 4	South east	1524	1.5	2.286
	Total volume of Dams within lot boundary			6.459

The existing clean water dams within the property do not exceed the maximum harvestable rights. Should it be required, TRC could construct new dams up to a capacity of approximately 2.2 ML without exceeding the MHRDC. No new stormwater dams are proposed at this time.

Water Quality Objectives

The NSW Water Quality Objectives are the agreed environmental values and long-term goals for NSW's surface waters. They include community values and uses for waterways including a range of water quality indicators. The Proposal is located within the Namoi River catchment and the agreed Water Quality Objectives are the protection of:

- Aquatic ecosystems;
- Visual amenity;
- Secondary contact recreation;
- Primary contact recreation;
- Livestock water supply;
- Irrigation water supply;
- Homestead water supply;
- Drinking water at point of supply – Disinfection only;
- Drinking water at point of supply – Groundwater; and
- Aquatic foods (cooked).

The Proposal is not expected to compromise the above objectives considering the water quality controls that would be in place, including in particular the leachate management system.

The Site contains only ephemeral, constructed and highly modified watercourses as well as a number of dams. The nearest permanent watercourse is the Peel River about 1km to the east. Site specific water quality monitoring has not been undertaken for this assessment as there are no permanent waters on-site, nor any nearby surface waters that would be potentially affected by the development. The Site is located in an area of hobby farms, intensive agricultural industries and rural residential developments, and water quality in streams and rivers may at times be impacted by these activities.

6.8.3 Impact Assessment

Without proper planning, design and mitigation, surface runoff from the Site has the potential to carry contaminants from disturbed areas during construction and processing and storage areas during operation, which could contribute pollution to the local drainage system and downstream catchment.

To prevent water quality impacts the proposed facility is designed with appropriate stormwater controls to prevent uncontrolled discharge of potentially contaminated water, including leachate and stormwater from the Site. The stormwater management strategy is to separate waters according to their anticipated quality and management options.

The management and storage of water on-site has been designed to ensure the following objectives are met:

- Capture and store rainwater from building roofs for use on-site;
- If required, use underground bore water when water supplies are low;
- Store imported water (process) for use on-site;
- Separation of clean (stormwater) and dirty (leachate) water across the Site;
- Storage of clean (stormwater) and dirty (leachate) water separately for use on-site;
- Prevention of uncontrolled discharge of water from the Site;
- Prevention of leachate contaminating the subsoil and groundwater; and
- Prevention of water pooling on working surfaces.

In relation to "clean" stormwater diversion, all upslope clean stormwater runoff will be separated from the organics receival, processing and storage areas and diverted around the development Site using a network of constructed drainage channels. These are depicted on the preliminary engineering design (**Appendix D**) and would be subject to further detailed design following development consent. The clean water diversion system can be readily installed on-site without any complicated drainage or other features that would render this unachievable. The Site contains many existing contour banks and some will be able to be utilised in the clean water diversion system. Clean water would be directed generally into the existing drainage line and dams to the east of the Proposal footprint.

The rainwater collected from the building rooftops will supply most on-site requirements including the wheel wash while the Receival Shed rainwater will be used for wash down of the receivals area. Rainwater collected for amenities use will be filtered twice (40 micron and 10 micron) followed by a UV filter.

Dirty stormwater runoff from processing, storage and receival areas which has the potential to be in contact with processed or unprocessed organics, will be managed as leachate in accordance with NSW EPA requirements. Leachate water will drain to a leachate dam (discussed further in Section 6.10).

The stormwater dam would continue to receive runoff from areas of the site not affected by the ORF, as well as runoff from clean areas of the ORF development. Water collected in the stormwater dam may be used at times to meet the process water demands via topping up the rainwater tanks.

Accidental spills or leaks of hazardous or polluting materials within the Site have the potential to result in contaminants being transported into the stormwater and leachate drainage systems, and ultimately the environment. Procedures for spill management would be included in the Environmental Management Plan for the Site and would minimise the risk of impacts in the event of a spill.

Impacts to surface water and hydrology are considered to be minimal and are manageable through implementation of appropriately designed and constructed stormwater drainage and retention facilities. Key to this is separation of the process water system (managed as leachate) and clean stormwater. Impacts to water quality and hydrology of surface waters is expected to be negligible. The separate stormwater and process water systems contain appropriate water quality protection measures. Any runoff from Site that results in surcharge of the dams (clean water or leachate) would follow an informal flow path across vegetated land to the east of the facility and must drain overland more than 2km before reaching the Peel River. Therefore, the impact to water resources in the area as a result of the Proposal is expected to be minimal.

6.8.4 Mitigation Measures

The Proposal will apply appropriate mitigation measures to manage potential surface water impacts as listed in Table 6-33.

Table 6-33 Surface water mitigation measures

Ref	Mitigation measures
Construction	
SW1	An Erosion and Sediment Control Plan will be developed as part of the construction environmental management plan for the Proposal in line with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004; the "Blue Book").
Operation	
SW2	The water management system will be designed in accordance with the EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
SW3	The facility will be designed and constructed such that the grades do not cause or permit any incidental pooling of water on the premises.
SW4	Separate drainage collection and treatment systems will be maintained for clean stormwater runoff and processing area leachate.
SW6	An operational water management plan will be developed and include procedures to manage the capture, storage, reuse and discharge of stormwater and leachate.
SW7	Procedures for management of potential spills of hazardous materials will be included in the water management plan.
SW8	Prepare appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them.

6.9 Groundwater

6.9.1 Introduction

This Chapter describes the existing groundwater conditions in the locality based on desktop research, topographical maps, on-site investigations, monitoring undertaken by Regional Geotechnical Solutions Pty Ltd (RGS) and geotechnical reports.

A geotechnical report was prepared by Regional Geotechnical Solutions (**Appendix J**) to identify the geotechnical conditions at the Site and the potential impacts of the Proposal. A summary of these investigations and key findings is provided below.

6.9.2 Existing Environment

Groundwater Bore Search

Information on existing groundwater bores in the locality was gathered using searches of the Water NSW Real-time Water Data and Bureau of Meteorology Australian Groundwater Explorer. Figure 6-36 shows the existing bores within an

approximate 2 km radius of the Proposal Site. Table 6-34 provides a summary of information available for these bores. Some of the bores are situated in Peel River alluvium while others are in the deeper fractured rock aquifer. Information on groundwater availability and standing water levels was generally not available.

Table 6-34: Summary details from nearby groundwater bores.

Bore ID	Bore Depth (m)	Drilled Date	Purpose	Salinity	Latitude	Longitude
GW012850	11	01-01-00	Water Supply	N/A	-30.9704	150.828071
GW019330	5.2	01-08-62	Water Supply	N/A	-30.9776	150.852792
GW020741	26.2	01-12-63	Water Supply	N/A	-30.992	150.838071
GW046955	37		Stock and Domestic	N/A	-30.9673	150.837793
GW051479	22.6	01-06-80	Irrigation	N/A	-30.9784	150.828626
GW052816	91.4	01-08-80	Stock and Domestic	N/A	-30.9912	150.837793
GW060522	18	01-12-84	Water Supply	N/A	-30.9768	150.853348
GW060564	15		Stock and Domestic	N/A	-30.9787	150.838348
GW065040	36.5	21-12-89	Water Supply	N/A	-30.992	150.837793
GW065404	49	26-07-90	Water Supply	N/A	-30.9895	150.839459
GW065431	42	31-08-88	Water Supply	N/A	-30.9751	150.830293
GW901364	38		Stock and Domestic	N/A	-30.9821	150.833173
GW901365	18		Water Supply	N/A	-30.9863	150.850717
GW965930	35		Water Supply	N/A	-30.9909	150.843653
GW968333	56	04-03-08	Irrigation	N/A	-30.9842	150.850521
GW970550	39.6	14-01-13	Water Supply	N/A	-30.9786	150.846867
GW021567	19.8	01-01-64	Stock, domestic	Hard	30°57'48.3"S	150°50'41.1"E
GW045538	18.3	N/A	Stock, domestic	N/A	30°57'50.3"S	150°50'54.1"E
GW021569	6.1	01-11-63	Stock, domestic	Good	30°57'45.3"S	150°50'59.1"E
GW046954	12	N/A	Stock	Good	30°58'03.3"S	150°51'03.1"E
GW093014	10	21-09-99	Monitoring bore	N/A	30°57'57.3"S	150°51'07.1"E
GW093013	9	19-09-99	Monitoring bore	N/A	30°57'58.3"S	150°51'14.1"E
GW093012	14	17-09-99	Monitoring bore	N/A	30°57'59.3"S	150°51'28.1"E
GW093011	18	11-02-00	Monitoring bore	N/A	30°58'02.3"S	150°51'47.1"E
GW065404	49	26-07-90	Stock, domestic	fair	30°59'22.3"S	150°50'22.1"E
GW970550	39.6	14-01-13	Stock, domestic	N/A	30°58'42.8"S	150°50'48.7"E
GW965930	35	N/A	Stock, domestic, commercial, industrial (low security)	N/A	30°59'27.2"S	150°50'37.2"E
GW051955	90.8	01-07-80	Stock, domestic	N/A	30°59'36.3"S	150°50'28.1"E

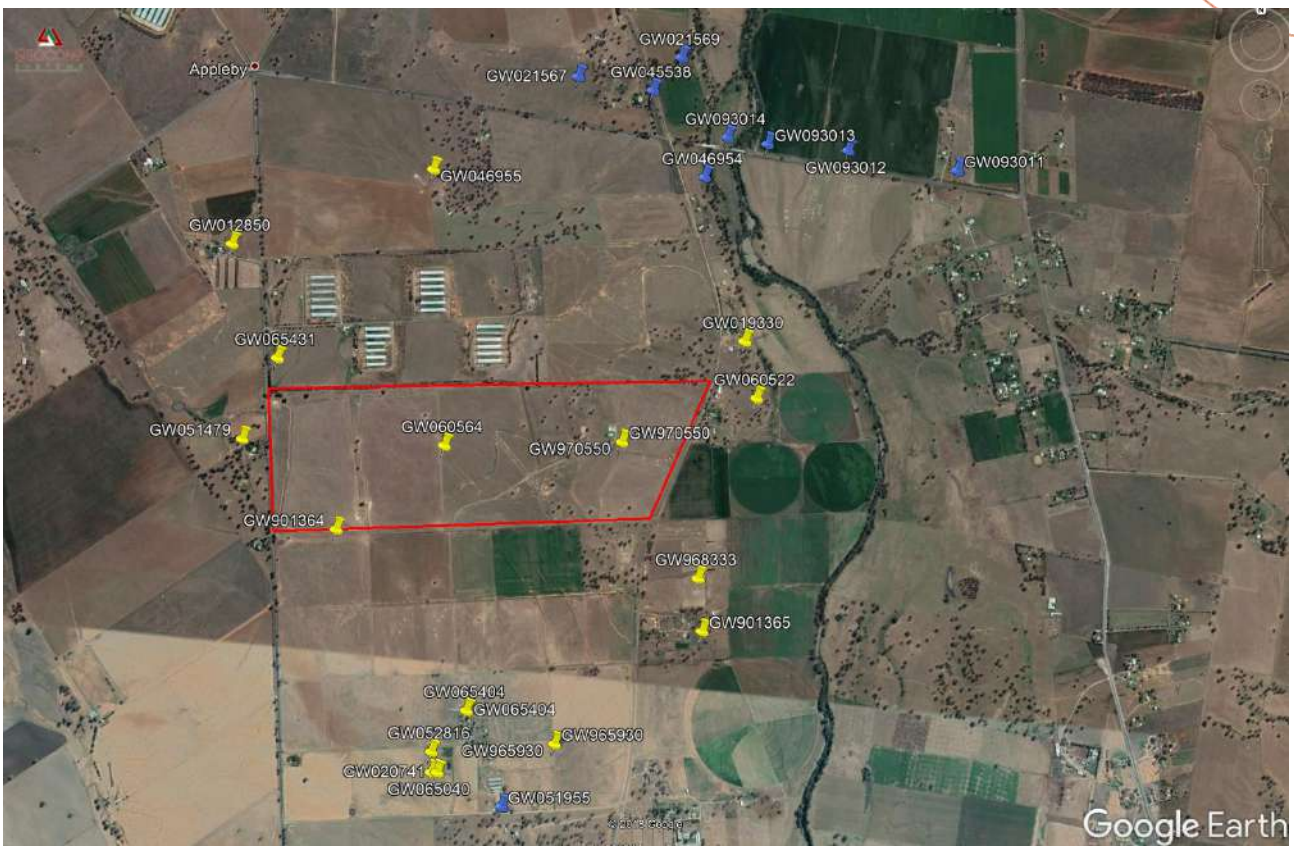

Figure 6-36 Aerial photo showing nearby groundwater bores (Source: Google Earth)

Two bores are located on the Proposal site – GW060564 and GW970550. AquaNorth, a local Contractor, undertook pumping tests on two occasions for the bore closest to the residence (GW970550) with a view to assessing its suitability for water supply. Standing water level depth prior to pump test commencing was about 17.7m below ground, increasing to about 25 m below ground at completion of the 30-minute pump test. The test was conducted at a pump rate of approximately 15L/min. As a result of the test AquaNorth advised that long term bore developing may result in a higher yield; but ultimately recommended that if a production bore is required a new bore should be drilled with a larger diameter (8") and deeper (estimated at around 50 m). The existing bore is within an Irrigation area with wells that produce higher yields estimated up to 15 litres per second.

The geotechnical testing conducted at the Proposal Site included excavation of five test pits to depths up to 1.4m. Residual soils were encountered over weathered siltstone at depths of between 0.35m and 0.9m before refusal in stiff siltstone. No groundwater was encountered in the test pits and no evidence of temporary groundwater inundation (e.g. mottling) was observed through the soil profile. The Site does not have high groundwater tables that would present a high groundwater pollution hazard.

No Site-specific baseline groundwater quality data is available.

6.9.3 Impact Assessment

Groundwater quality

Construction of the Proposal would involve cut to fill earthworks associated with the construction of hardstands, building foundations, roads, utilities, drainage infrastructure and dams. These earthworks would occur to depths of up to about 3m below existing ground levels. Excavation is not likely to encounter or intercept groundwater based on the observed absence of a high groundwater table. Aquifer interference during construction is not expected.

Operation of the Proposal includes collection and processing of organic materials that have potential to contribute pollution to groundwater. Leachate from composting and related organics-processing is typically high in nutrients and

biological oxygen demand (BOD) and can become host media for bacteria and other pathogenic microorganisms.

Prevention of groundwater pollution is a key focus for design of the facility and would be undertaken in line with performance standards outlined in the EPA Guidelines (DEC 2004). The Site will employ two separate drainage systems for clean stormwater and leachate. All working surfaces will be constructed from inert, low-permeability materials and will be capable of supporting the load of material and machinery without sustained damage thus protecting and maintaining the gradient.

The hard stands for the pasteurisation and maturation areas would be designed with an appropriate fall to ensure free drainage and minimise ponding and maintain access in all weather conditions. The preliminary engineering design includes consideration of pavement types and further hardstand design details would be outlined in the detailed design. These hardstands would employ a leachate barrier, forming an impermeable barrier between groundwater and the composting or stored organics. The EPA Guidelines (DEC 2004) indicate the leachate barrier may be either:

- A clay or modified soil liner consisting of at least 600mm of re-compacted clay with in-situ permeability (KJ) of less than 10^{-7} ms^{-1};
- A natural geological barrier that is proven by competent geotechnical investigations to meet the above criteria; or
- Concrete or asphalt pad.

All leachate water will drain to a leachate dam under gravity via designated pipelines or lined drains to prevent leachate from contaminating the subsoil. The leachate dam is sized to accommodate 16ML as identified in the water balance (**Appendix N**). The leachate dam structure will consist of a clay or modified soil liner consisting of at least 900mm of re-compacted clay with an in-situ permeability of 10^{-9} ms^{-1} as per the requirements of the NSW EPA (2004) Guidelines.

The Proposal is unlikely to impact groundwater resources as the design and implementation of leachate and wastewater collection and reuse facilities will include clay or soil liners that provide an effective barrier between groundwater and potential pollution sources. A groundwater monitoring program will be developed to include regular monitoring downslope of the leachate dam to detect potential contamination, with comparison to a reference bore over time. Strategies will be implemented in accordance with EPA Guidelines that minimise the potential for groundwater pollution from the Proposal.

Groundwater Use

It is expected that a new or upgraded bore would be established to provide a secure source of production water for dust suppression and water make-up in the composting process. It is likely that the bore would need to be deeper and of larger diameter. Whether a new bore, or an upgraded bore, these groundwater works would be subject to licensing and other approvals with DPI Water which would be sought post development consent.

The approvals requirements would include:

- Establishing the required volumetric entitlement under a water access license, reflecting a change in use to industrial (from stock and domestic); and
- Water supply work and water use approvals.

6.9.4 Mitigation Measures

The Proposal will apply appropriate mitigation measures to manage potential groundwater impacts as listed in Table 6-35 Groundwater mitigation measures.

Table 6-35 Groundwater mitigation measures

Ref	Mitigation Measures
Construction Mitigation Measures	

GW1	The Construction Environmental Management Plan will include measures to avoid interception of groundwater during excavation of the Proposal.
GW2	The Construction Environmental Management Plan will include a procedure that outlines the steps required if groundwater is unexpectedly encountered during construction.
Operation Mitigation Measures	
GW3	A leachate capture and management system will be designed and constructed for the processing, storage and receival areas in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
GW4	A groundwater monitoring program will be developed to include regular monitoring downslope of the leachate dam to detect potential contamination, with comparison to a reference bore over time.

6.10 Leachate and Wastewater Management

6.10.1 Introduction

This chapter describes the management of wastewater generated during operation of the proposal. The only wastewaters that would be generated during construction are sewage wastes and are likely to be managed using PortaLoos.

Leachate is defined as any waters that come in contact with either raw (unprocessed) or processed (composted) organics. Leachate can be relatively high in dissolved nutrients and organic matter and must be appropriately managed to prevent water quality impacts in receiving waters. Some organic materials contain sufficient quantities of moisture to generate leachate without extra water being added, while some organic materials form leachate only with the addition of water (e.g. rainfall).

Leachate can be acidic, especially when generated under anaerobic conditions, which has the potential to cause the dissolution of metals and metallic compounds present in some organics. Under aerobic conditions alkaline leachate may form from waste with low carbon / high nitrogen ratios (e.g. food and animal organics). Leachate management is one of the key environmental management requirements for operation of the ORF and is discussed further in this chapter.

Additional sources of wastewater from the Proposal include a truck wash bay and on-site generated sewage, which must also be managed to prevent pollution.

A water balance prepared for the site (**Appendix N**) identifies areas of wastewater collection, storage and reuse in the proposed facility, and identifies an appropriate size of the proposed wastewater management systems, which are summarised in this chapter.

6.10.2 Existing Environment

The Site is currently used for agricultural pasture and cropping and as such does not generate wastewater. Overland flow of surface water occurs across the Site in a north to south east direction.

6.10.3 Impact Assessment

The Proposal is designed with a system of rainwater, stormwater and leachate separation, and collection for storage, recycling and reuse, as described in Section 6.8. Water collected on-site will be stored and reused to the maximum extent possible. Table 6-36 lists the areas and surfaces that will collect and divert runoff into the leachate dam and storage tanks on-site. Water reuse will help ensure an adequate and secure water supply for the life of the Proposal, minimising the need for fresh water input from the proposed backup bore water supply.

Table 6-36: Wastewater storage requirements

Area	Area m^2	Water Type	Mean Annual Runoff Volume **(m^3 per annum)**	Storage Type	Designed Storage Volume
Office/Amenities Building roof	158	Rainwater	Not modelled	Tank	20kL
Equipment Shed roof	840	Rainwater	Not modelled	Tank	300kL
Process building and biofilter	4,715	Rainwater	2,980	Tank	300kL
Non-Process Area runoff	153,400	Stormwater	6,530	Stormwater dam	2.4ML
Process Area runoff	13,600	Leachate	3,500	Leachate dam	16ML
Maturation Pad	21,000		4,240		
Imported – Process Water (UV treated on-site)	N/A	Underground Bore	N/A	Underground	N/A
Imported – Firefighting (trucked to site in tankers)	N/A	Potable Water	N/A	Tanks	590KL (effective)

Leachate generation

Leachate is generated where there is an excess of water applied to the composting matrices. This may be due to excess watering, or due to rainfall. Stormwater runoff from processing, storage and receival areas which has the potential to be in contact with processed or unprocessed organics, will be managed as leachate in accordance with NSW EPA requirements.

Leachate could be generated in the following areas:

- Overflow from the tunnels and condensate from associated ductworks (referred together as process water). A small (70kl nominal) tank is proposed for capturing and reusing this water source within the tunnels. Rarely this tank may overflow and water would be directed to the leachate dam. This volume would be minimal.

- Rain fall runoff and leachate return from the maturation pads via the leachate drainage system. This includes any excess water 'sprayed on the maturing compost that does not get absorbed by the compost or evaporated. For the purposes of modelling it was assumed that 50% of the potential moisture loss from air-drying compost is returned to the leachate dam as leachate. This is very conservative, as almost all of the loss will be to atmosphere via evaporation.

- Runoff from process areas where there is potential contact with organic or composting materials. This includes the hardstands and roads surrounding the process building.

Leachate collection and management

All pavement areas that contain organic materials will be appropriately sealed, bunded and graded sufficiently to prevent clean water run-on mixing with leachate water and also to prevent unwanted ponding of leachate water within the

operational areas. Leachate water will be diverted via appropriately lined (e.g. HDPE or clay lined) drainage channels, and pipes, to a leachate storage dam.

The leachate management system is designed in accordance with the NSW EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004; the "EPA Guidelines"). Information on the design of the leachate dam including size calculation are contained in the Preliminary Engineering Design (**Appendix D**) and Water Balance (**Appendix N**). These calculations would be refined during detailed design and by the operating contractor prior to construction to ensure the environmental objectives and mitigation measures outlined herein are achieved.

The leachate dam capacity was set at 16 ML based on the results of the site water balance modelling. This capacity includes:

- Minimum EPA requirement: capacity to capture runoff from a 1 in 10 year, 24 hour storm event (approximately 99 mm rain depth) from all processing areas. This equates to approximately 3.1 ML storage.

- additional storage capacity (approximately 13 ML) to manage operational water needs and minimise the risk of leachate overflow.

This capacity of 16ML was determined to allow the leachate dam to operate with a maximum likelihood of two overflow events per twenty years in a median 20 year period. This dam size provides a very high factor of safety and is more than 5 times the recommended minimum requirements based on the EPA guidelines. It is noted that the water balance and the various assumptions used therein, would be further refined during detailed design and this may result in review of the leachate dam size.

The leachate dam structure will be lined to prevent leachate from leaking through the base to groundwater. Liner design would be undertaken during detailed design. To meet the requirements of the EPA Guidelines, the liner would comprise a clay or modified soil liner consisting of at least 900mm thick of recompacted clay with an in-situ permeability no greater than 10^{-9} ms^{-1}, or an alternative liner providing a similar level of protection such as synthetic (plastic) material.

A spillway is included in the design of the leachate dam for dam safety. Any emergency overflows from the leachate dam would be directed to the east following an overland flow path, ultimately to join the stormwater drainage system. If the leachate dam reaches capacity, and should monitoring identify the need, excess leachate may be trucked off-site to an appropriately licenced facility to ensure dam levels remain suitable for site operations and forecasted weather.

The leachate dam has ample capacity to provide temporary storage of leachate for reuse within operations. Operational procedures and monitoring would be in place to ensure the dam always retains sufficient free capacity to capture the design storm event based on EPA requirements, i.e. 3.1 ML.

Collected leachate water would be reused in the composting process. It is currently planned to only reuse leachate water in the first stage of composting - pasteurisation, which occurs in the tunnels. This is to minimise the risk of transfer of pathogens from leachate back in to the maturing compost. Further investigations and monitoring may determine that it is acceptable to also use leachate in the maturation stage, and this would further assist in management of leachate water.

By careful design and implementation of a discrete leachate drainage and reuse system separate from stormwater, potential impacts from leachate and other wastewater are considered to be minimal. Lining of the leachate dam and drainage system would protect soils and groundwater. The potential for uncontrolled discharge of leachate water to stormwater in heavy rainfall runoff events (i.e. above the design storm) is very low due to the excess freeboard that has been built into the design of this dam; however, this could occur during very large rain events and appropriate management procedures would be developed to address this unlikely event. The risk of uncontrolled discharge will be managed through regular monitoring and management of dam levels. **Appendix N** further describes the leachate drainage system design and **Appendix D** includes preliminary design drawings depicting the planned separation from the stormwater system.

Potable and amenity requirements

Potable water requirements were calculated assuming 6-employees on-site for 7 days per week including use by visitors and truck drivers.

Assuming 40 litres of water per person / day and six (6) person workforce, the monthly freshwater (potable) requirement is approximately 240 L/day, or 87kL per year. Rainwater will be collected from building roofs across the Site and stored in tanks to be used for amenities and operational requirements. As the roofs will potentially accumulate dust and debris from an industrial environment, rainwater collected for amenities use will be filtered twice (40 micron and 10 micron) followed by a UV filter.

Water for fire suppression will be imported via tanker as required.

On-site Sewage Management

An On-site Sewage Management (OSM) System, is proposed for use on-site as the Site is not connected to or able to be practically connected to the TRC sewerage system. Wastewater loads from the Site would be small (estimated at <500 L/day) and would be managed in a domestic sized OSM System. There is ample space available on the rural property for irrigation of secondary treated effluent from a domestic OSM system. The landscape is capable of supporting effluent irrigation, having no major soil, hydrology or landscape constraints. The details of an appropriate OSM system would be outlined in an application to TRC under Section 68 of the Local Government Act 1993.

Wash Bay

Vehicles that use composting and related organics processing facilities will be washed to remove and collect mud and litter on their wheels prior to the vehicle leaving the Site.

The truck wash bay will be a fully contained system with water recycling capability using on average 100L of water per large truck per wash. The system includes a 5,000L tank with submersible pump for water collection and reuse. Any overflow water from the tank should be drained to theleachate dam via a gross pollutant trap with an oil boom or similar. This would be determined during detailed design.

6.10.4 Mitigation Measures

A description of the mitigation measures that will be implemented to address potential wastewater impacts associated with the Proposal are provided in Table 6-37.

Table 6-37 Leachate and wastewater mitigation measures

Ref	Mitigation Measures
Construction Mitigation Measures	
WW1	The Construction Environmental Management Plan will include measures for managing sewage wastes during construction (e.g. Portaloos).
WW2	Water Balance to be reviewed by the operator prior to operation based on any changes to inputs and water sources that occur during detailed design.
Operation Mitigation Measures	
WW3	All water that comes into contact with the organic processing area will be collected, stored and managed as leachate in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
WW4	The leachate and stormwater storage dams will be designed in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).

Ref	Mitigation Measures
WW5	A wastewater management plan will be prepared that illustrates all wastewater systems on-site and provides operational management procedures and responsibilities to ensure that adequate pollution prevention procedures are in place.
WW6	Emergency response procedures will be prepared for situations where overtopping, breach or other failure of the leachate dam occurs.
WW7	A procedure will be developed to ensure adequate capacity is available in the leachate dam for capture of the 1 in 10yr, 24-hour storm, while allowing additional temporary storage of reclaimed water for on-site reuse. The procedure will include regular monitoring of weather forecasts and water levels in the leachate dam to minimise the risk of leachate dam overtopping during rain events.
WW8	All Site staff will be appropriately trained to enact pollution prevention procedures.
WW9	Leachate water will be recycled for use in the processing of organic materials.
WW10	An Onsite Sewage Management (OSM) System shall be installed to manage sewage wastes during operations and would be outlined in an application to Council under Section 68 of the Local Government Act 1993, or in the EPL application.
WW11	The wheel wash will include a gross pollutant trap with an oil boom or similar prior to discharge of any overflow.

6.11 Waste Management

A waste impact assessment was completed to investigate the potential waste-related impacts of the Proposal. A summary of key findings of this assessment and associated mitigation measures are outlined below.

6.11.1 Introduction

As outlined in Section 1, the Proposal involves the construction and operation of an ORF which will divert organic material from landfill and reprocess it into recycled organic products. Details on the inputs (food and organic materials) and outputs (recycled organic products) and the processes employed at the ORF are outlined in Section 3.

The Proposal has the potential to generate waste from construction and operational activities. This chapter describes the types and classifications of waste that will likely be generated, handled, stored and/or disposed of from the Site.

The principles of the waste hierarchy as outlined in the *Waste Avoidance and Resource Recovery Act 2001* have been incorporated within the mitigation measures outlined within this waste assessment. The waste hierarchy provides guidance on the most preferable approaches to managing waste, starting with the most preferred action of avoiding waste and ending with the least desirable option of disposal in landfill. Waste generated from the Proposal will be managed in accordance with the waste hierarchy and classified in accordance with the EPA's Waste Classification Guidelines to ensure that waste leaving the Site is transported and disposed of lawfully and tracked as required.

6.11.2 Existing Environment

There are currently no activities on the Site that generate waste. As per Section 2, the Site is currently cleared agricultural land and was historically used as a hobby farm. There are no buildings on-site and as such, the Proposal does not require the demolition of any structures.

6.11.3 Impact Assessment

There will be no waste impacts arising from demolition due to the site being located on cleared agricultural land with no existing structures.

Potential impacts from the generation, handling, storage and disposal of waste from the Proposal includes:

- Pollution of land, air and waterways
- Overuse of scarce resources
- Human, animal and environmental health impacts
- Amenity; and
- Risk to adjacent aviation activities from airborne litter.

Activities proposed during the construction and operation of the Proposal that will potentially generate waste include:

- Excavation
    - Site stripping (topsoil, subsoil)
    - Minor vegetation removal (weeds, clearing, residual crop)
    - Cut and fill earthworks (51,000m^3); and
    - Pipeline trenching
- Construction
    - Construction of roads, buildings and other infrastructure (leachate dam, stormwater dam); and
    - Domestic waste, recyclables and biological waste from construction workers
- Operation
    - Used oils, hydraulic and other plant fluids arising from plant and equipment maintenance
    - Non-compostable items (contamination) removed via the screening process; and
    - Domestic waste, recyclables and biological waste from use and management of the ORF by on-site personnel.

The Proposal is expected to general the following waste types during excavation, construction and on-going operational stages, as outlined within *Table 6-38*. Waste classifications have been performed according to the Environment Protection Authority's *Waste Classification Guidelines (2014)* and associated addendums.

Table 6-38: Expected Waste Types Generated from the Proposal

Waste Type and Description	Waste Classification	Management Details
Excavated Soil Topsoil, subsoil, rock, gravel, silt	General Solid Waste (non-putrescible)	No demolition waste is anticipated to be generated for the road upgrade works. All excavated material (excluding weeds and any organic residual crop) will be reused onsite as fill material. No imported fill material is anticipated to be required for the construction works of the facility. However, pavement materials will be imported to site.

Waste Type and Description	Waste Classification	Management Details
Green Waste Trees, shrubs, weeds	General Solid Waste (non-putrescible)	Any large trees will be reused onsite as mulch for landscaping. Other green waste including shrubs and weeds will be disposed of at the FRWMF to be composted.
Construction Waste Concrete, metal, steel, timber, fittings, strapping, plastic wrapping and packaging, electrical and plumbing components	General Solid Waste (non-putrescible)	The construction of site buildings and structures will involve predominantly prefabricated components manufactured off-site and transported to the Site for installation/assembly. As such, the construction of the Proposal is not expected to generate a significant amount of construction waste. All attempts will be made to separate and reuse or recycle building materials.
Domestic Waste Paper, cardboard, aluminum cans, plastics, glass, food organics etc. generated by onsite staff.	General Solid Waste (non-putrescible and putrescible)	The limited general waste generated on-site by onsite staff during construction and operation will be separated into recyclable and non-recyclable components. General waste and recycling bins will be provided in the site office and at other locations around the site where deemed necessary. Any remaining waste that cannot be recycled will be disposed of at the FRWMF. During operations, any non-compostable items removed via the manual screening process will be separated into recyclable and non-recyclable components and recycled or disposed of as appropriate, offsite.
Liquid Waste Oil, paint, lubricants, glue etc.	Liquid Waste	A limited amount of liquid waste is expected to be generated by the Proposal. Liquid wastes would be stored appropriately onsite in bunded areas and disposed of at a suitably licensed facility. Dependent on the liquid waste, it will preferably be recycled offsite at a suitable local facility.
Contaminated Soil Potential spills of chemicals or fuel that could result in contaminated soil (or organic material)	To be determined	After classification, will be disposed of at an appropriate licenced facility.

Waste Type and Description	Waste Classification	Management Details
Biological Waste Sewage from on-site staff toilets	Liquid Waste and General Solid Waste (putrescible)	There are no existing toilets for use during construction phase. Construction contractors will use temporary and mobile temporary toilets (such as portaloos) which will be serviced by the provider with liquid waste transported offsite for treatment. An on-site septic system will be implemented for use during operations after application to TRC.

Expected organic material streams and volumes identified for the on-going operational stage of the Proposal have been identified in Section 3.5. Unexpected finds and/or contaminated materials will be assessed using the EPA's Waste Classification Guidelines (2014) and associated addendums.

Waste types generated during the proposal requiring off-site management will be taken to the local Waste Management Facility as outlined within *Table 6-39*. Additional waste management and resource recovery details will be outlined within a Waste Management Plan (mitigation measure), completed before Site works commence.

Table 6-39 Waste Management Facility

Waste Facility	Address	Accepted Waste Types	Contact Details and Opening Hours	Distance from the Site
Forest Road Waste Management Facility	123A Forest Road, Tamworth NSW 2340	Tyres, metal, batteries, used motor oil, timber, clean brick and tile, concrete, garden organic materials, general putrescible waste, commingled recyclables, asbestos, chemicals, drums.	7 days, 8 am – 4.45 pm 1300 733 625 6767 5555	< 20km

The management of materials from the Site (including handling, transport, identification, stockpiling and quality control) will be in accordance with the *POEO Act,* the facility's licence once operating, associated regulations and mitigation measures.

By its nature, the site as an ORF will be licensed to manage FOGO and Category 3 organic material inputs and as such operations will be managed in accordance with the Environment Protection Licence, including preventing excessive stockpiling and dirty water volumes exceeding onsite storage capacity. The inputs and outputs from the ORF will be managed in accordance with the NSW EPA's Resource Recovery Exemptions and Orders relating to compost. All on-going management of the site will be in accordance with licensing requirements and be included in the Construction and Operational Environmental Management Plans.

6.11.4 Mitigation Measures

Table 6-40 outlines the mitigation measures for potential impacts relating to construction and operational waste.

Table 6-40 Demolition, Construction and Operational Waste Mitigation Measures

Reference	Mitigation Measure
Demolition and Construction Waste Mitigation Measures	
W1	A Waste Management Plan (WMP) will be prepared as part of the CEMP to manage any construction waste. The plan will identify: • Types and volumes of waste likely to be generated • The procedure for assessing, classifying and storing waste in accordance with the EPA's Waste Classification Guidelines (EPA, 2014) • Storage and treatment of waste (including stockpiles) • Methods of transport and disposal of wastes (including waste that possesses hazardous characteristics) to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment • Opportunities for reducing waste, re-using materials and increasing recycling • Requirements for compliance with the Waste Avoidance and Resource Recovery Act 2001 • The Resource Recovery Orders and Exemptions requirements applicable to the waste on-site • Monitoring, record keeping and reporting e.g. waste tracking data demonstrating the lawful disposal of contaminated products, waste or residues generated at the facility.
W2	Waste management strategies and mitigation measures will be communicated to all employees and contractors during site induction, prior to commencing works at the site.
W3	Waste oil, hydraulic and other hazardous materials will be stored in secure containers and kept in a bunded and covered area. Hazardous wastes will be transported to a facility that is appropriately licensed to receive and recycle or treat hazardous wastes. Hazardous wastes will be tracked through transport to their final destination and the EPA notified of these waste movements.
W4	A schedule will be created with the temporary amenity hire contractor to remove sewage.
W5	All records demonstrating lawful disposal of waste are required to be kept for at least six years.
W6	FRWMF to be given appropriate notification before any large quantities of waste are deposited at the Facility.
Operational Waste Mitigation Measures	
W7	All records demonstrating lawful disposal of waste are required to be kept for at least six years.

Reference	Mitigation Measure
W8	All sampling and classification records will be retained for the life of the Proposal to demonstrate compliance with the EPA's Waste Classification Guidelines. These records will be readily accessible for inspection by regulatory authorities such as council, Office of Environment and Heritage (OEH), EPA and WorkCover NSW.
W9	Waste generated from the Proposal will be managed in accordance with the principles of the waste hierarchy. An Operational Environmental Management Plan (OEMP) will be prepared for the proposed facility with a Waste Management Plan that includes the following: • Mitigation measures and a procedure for safely and appropriately managing any unexpected finds/contaminated waste. • Before dispatching any waste from the facility, the waste material will be assessed and classified in accordance with the NSW EPA Waste Classification Guidelines Part 1: Classification of Waste (2014). • Any waste dispatched from the premises is to be sent to a facility that can legally accept the waste, with adequate notice of large loads advised to the facility ahead of receival. • The proposed facility will comply with the relevant EPL and/or waste-tracking requirements under the Protection of the Environment Operations Act (POEO) for any wastes assessed or classified as hazardous waste, industrial waste or 'Group A' waste. • If the waste to be transported requires tracking, approval to transport the waste must be obtained prior to transport in the form of a consignment authorisation issued by a person authorised to do so. A transport certificate must be created which will accompany the waste while it is being transported. The certificate is to be completed when the waste arrives at its destination and has been processed by the receiving facility; and • The facility will keep documented evidence e.g. waste tracking data demonstrating the lawful disposal of contaminated products, waste or residues generated at the facility.

6.12 Visual Amenity

6.12.1 Introduction

This chapter reviews the existing visual character of the site and its surrounds and provides an assessment of the potential impacts associated with the Proposal on the existing visual character, nearby residences and public vantage points.

6.12.2 Existing Environment

The Site is located within the Naomi Catchment within the Peel Valley (Figure 6-37). The Naomi River Catchment covers about 42,000 km^2 from the Tamworth Region, Great Dividing Range to the Walgett Region, Barwon River. The Proposal area is located north of the Tamworth Town Centre in the suburb of Gidley.

The Gidley landscape is predominately zoned RU1 Primary Production with a zone range over 4km in each direction of the Site. This zone encourages rural production industries to operate the area including poultry farms, hobby farms and rural residential properties. There are a number of industrial scale agricultural holdings in the vicinity of the proposal that include a number of large built structures and associated plant and equipment.

The topography and elevation of the Naomi Catchment elevations range from over 1,500m to the south and east to 100m on the alluvial floodplain of the lower catchment west of Narrabri, refer to Figure 6-37. The Proposal area is located within a depression north of Tamworth Town Centre and south east of Attunga in a slightly sloped landscape with the slope falling from the north to the south east of the Site.

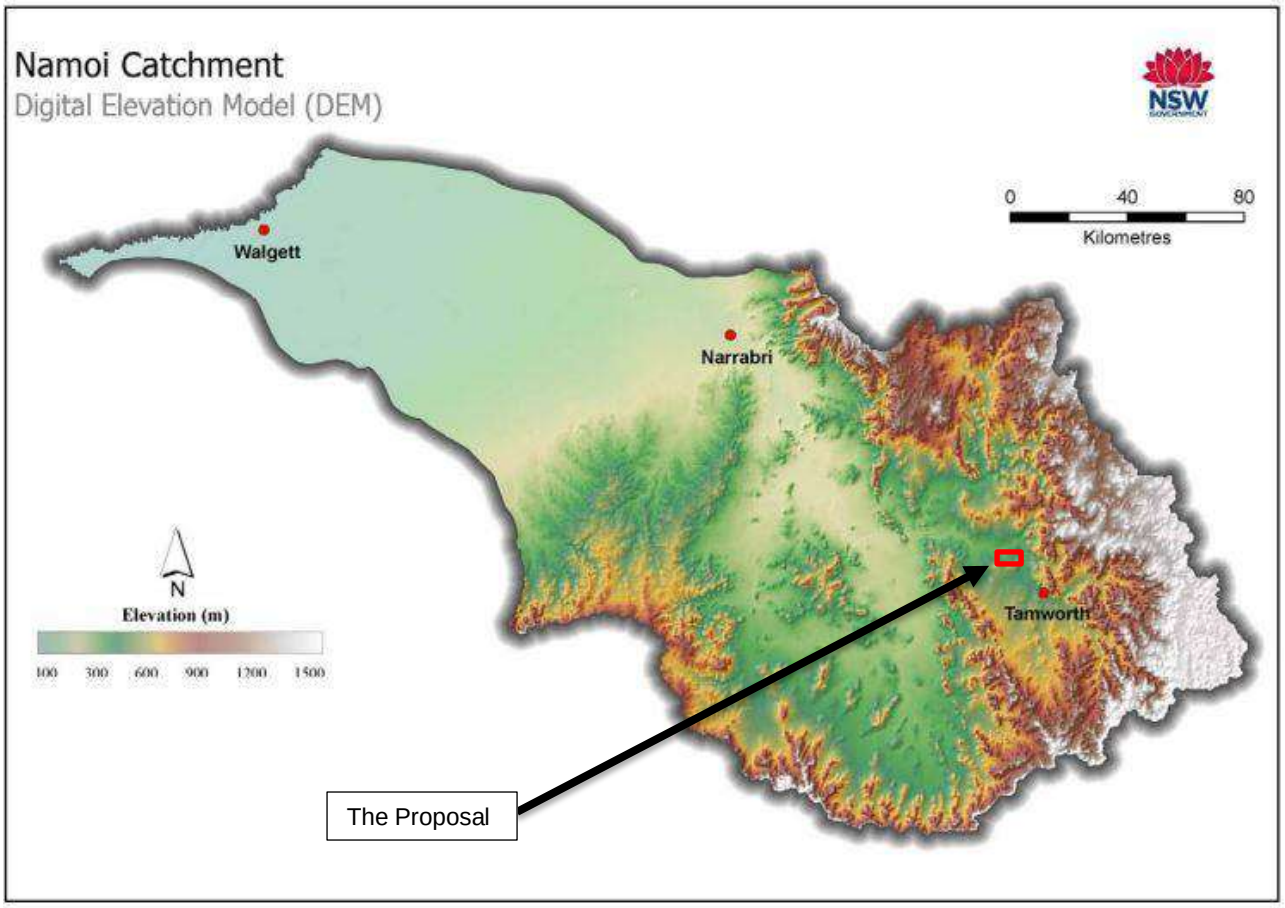

Figure 6-37 Topography and elevation of the Naomi catchment (Source: Green D., Petrovic J., Moss P., Burrell M. (2011) Water resources and management overview: Namoi catchment, NSW Office of Water, Sydney)

Due to the topography of the Site, the sensitive receivers with the most potential to be impacted are located directly adjacent to the property and those on the elevated surrounding land.

The surrounding landscape has a rural character comprising of predominantly cleared land and scattered rural residences, farm buildings and equipment and commercial/industrial buildings such as the nearby ProTen Poultry broiler.

Other dominant visual features (and public vantage points) of the area include a number of local roads, such as Gidley Appleby Road, Wallamore Road, Appleby Lane, Gidley Siding Road, Evans Lane, Manilla Road and the Oxley Highway. Further observations of the surrounding environment include:

- East of the site are scattered rural residences and the Peel River, a dominant visual feature of the area with the River located to the east of the Site;
- Directly to the west of the site on the other side of Gidley Appleby Road are two residences and irrigated and non-irrigated farming land to the west and the south west of the site;
- The Site itself is located on a rural property owned by TRC that has been largely cleared for agriculture and historically used for crop production and improved pastures. Figure 2-1 provides a locality map showing the location of the Proposal relative to major local features;
- The property drains into unnamed tributaries in a north east direction, which drain to the Peel River which is located on the eastern boundary of the proposed Site. This Peel River is lined with scattered mature trees which limits views into the Site from the east;

- Parts of Gidley Appleby Road are also lined with trees which filters views into the Site from area from the west;
- The local topography surrounding the Site is characterised by gentle rises and slopes with gradients less than 2% allowing the Site to be visible from Gidley Appleby Road. However, the distance of the Proposal from the road is over 600m. The location of the site in a rural environment and the distance from viewing locations in the local area (such as the Gidley Appleby Road and three closest residences) significantly limits potential views of the Proposal; and
- The existing road corridors including the adjacent Gidley Appleby Road are comprised of highly disturbed vegetation.

A series of viewpoints were selected in order to assess the potential visual amenity impacts of the Proposal (See. These viewpoints, provided in Figure 6 38 to Figure 6 41 reveal the surrounding visual character of the area.

Figure 6-38 Gidley Appleby Road facing east towards the Site (Source: pitt&sherry 2019)

Figure 6-39 At the existing stormwater dams on Site facing North (Source: pitt&sherry 2019)

Figure 6-40 Facing south on Gidley Appleby Road towards existing access point of the Property (Source: pitt&sherry 2019)

6.12.3 Impact Assessment

The works with the potential to impact on the visual amenity include:

- Lighting of the building and access gate.
- Erection of a number of above ground structures on the Site, including an equipment shed, office and Receival Shed (**Appendix D**).

The Receival Shed will be the highest structure on-site to allow access by kerbside collection vehicles and other commercial waste vehicles. While it has the greatest potential for visibility due to its overall height, however its positioning on the low end of the sloped site will minimise visual impact. The height levels of the proposed structures on the Site are outlined in Table 6-41; and

Table 6-41 Height of Proposed facility buildings and structures

Structure	Maximum height (m)
Equipment Shed	8
Office	3.6
Receivals Shed	11
Storage tanks	5

The structures to be installed for the ORF are similar in nature to existing agricultural activities in the area at a larger scale i.e. colourbond sheds and stockpiles. These operations do not present any potential to result in glare impacts.

Based on the Proposal, desktop assessment and site visit (see viewpoint photos Figure 6 38 to Figure 6 41) the followings observation was made and summarised in Table 1-1

Table 6-42 Viewing location details

Viewing Location	Summary of Findings
Gidley Appleby Road (West of Site)	Gidley Appleby Road is located approximately 600m west of the proposed ORF, however the access gate is located on the southbound lane of Gidley Appleby Road. The Site is accessed from this road. There is some vegetation lined along Gidley Appleby Lane which will partially obstruct views to the Site. Figure 6-38 looks east from Gidley Appleby Road towards the Site which is located 600 m from Gidley Appleby Road. The entry to the Site will have a solar powered light with average illumination of 10 lux which has the potential to be visible from this area. The building will also have high bay lighting within the canopy of the building with an average illumination of 240 lux.
ProTen (poultry broiler (North of Site)	Figure 6-39 depicts the northerly view of the Proposed facility area to the neighbouring ProTen Site. There is a sparse tree line on the boundary fence and combined the distance between the proposed site and ProTen it would be limited views of a similar industrial facility to that at the viewpoint. No public viewpoints are likely from this location.
Wallamore Road (East of Site)	It is not expected that the proposal will be seen from the east of the Proposed facility. This is due to the elevation and distance from Wallamore Road. Wallamore Road at this location is also private access only.
Aerial	Roofing materials will be non-reflective and any required lighting will be directed downwards in accordance with the Australian Standard AS4282 – Control of Obtrusive Effects of Outdoor

Viewing Location	Summary of Findings
	Lighting (1997). These measures and the distance of incoming and outgoing planes from the Site will minimise visual impact from aerial views.

In addition to the above public viewpoints a visual impact assessment of the proposal on sensitive receivers has been undertaken in consideration of the Roads and Maritime Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment (RMS 2013). The method to measure visual impacts is based on the combination of the sensitivity of the existing view to change and the magnitude (scale, character, distance) of the proposed modification on that view. These guidelines are utilised in lieu of other relevant industry guidance for assessment of visual impact. The receivers considered are shown in Figure 6-41.

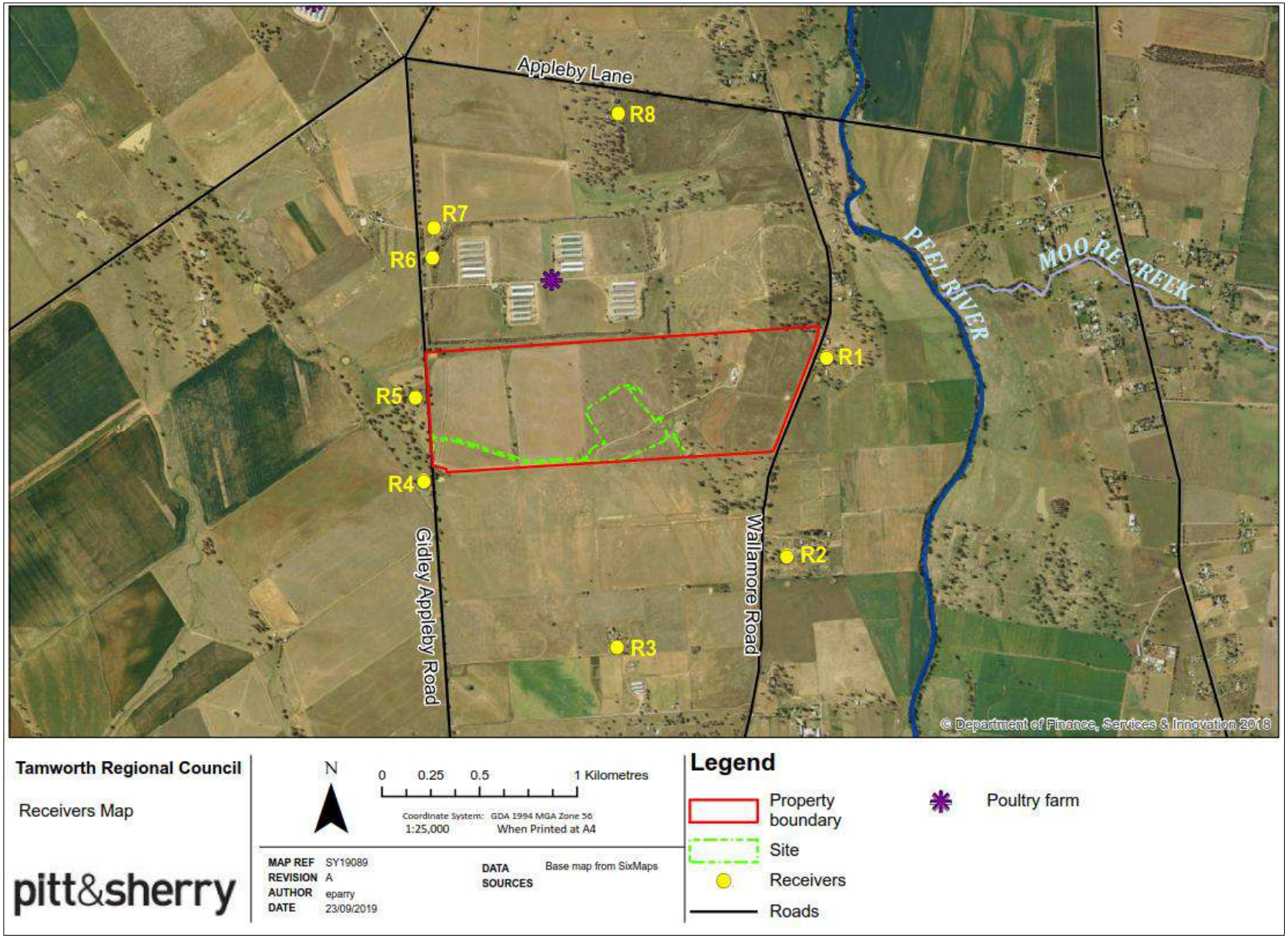

Figure 6-41 Receivers around the Proposal

Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed change. For example, a pristine natural environment will be more sensitive to change than a built up industrial area.

Magnitude refers to the physical form and location of the Proposal. For example, a large building close to the road would have a very different impact on views than a large building at a distance from a road in the same area.

The combination of sensitivity and magnitude will provide the rating of the visual impact for viewpoints as outlined in Table 6-43.

Table 6-43 Visual impact grading matrix (Source: Roads and Maritime).

Sensitivity \ Magnitude	**High**	**Moderate**	**Low**	**Negligible**
High	High impact	High moderate	Moderate	Negligible
Moderate	High moderate	Moderate	Moderate low	Negligible
Low	Moderate	Moderate low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 6-44 below provides a summary of the visual impact assessment using the above methodology.

Table 6-44: Visual impact of key viewpoints

Viewpoint	Impact of the proposal	Sensitivity	Magnitude	Overall impact	Comment
Gidley Appleby Road Private residences - R3, R4 and R5	Views of construction plant, equipment, as well as material storage at the compound sites on-site may be visible from the Road and residences. Views of construction work would be short-term. The majority of works will occur out of the line of sight over a distance from the road and residences. Most of the Site would not be visible from the road during operations. The roofline of the larger structures on Site may be visible from roads and residents adjacent to the Site. Minor vegetation removal will occur to the groundcover and 1 tree will be removed. Landscaping will occur around the Site and boundary fences. The ORF would increase the number of vehicles entering and exiting from the access point Gidley Appleby Road. Lighting at the entrance of the Site may be visible at nearby residential receivers. The closest receiver is approx. 200m from the access point and 800m from the built infrastructure thus minimizing the magnitude of the impact.	Moderate	Low	Moderate—Low	The Proposal would be unlikely to have a substantial impact due to the Site being predominantly cleared, similar to surrounding agricultural industry and the distance of the ORF structures from the road and residences.

Viewpoint	Impact of the proposal	Sensitivity	Magnitude	Overall impact	Comment
Wallamore Road Private residences – R1 and R2	Wallamore Road to the east of the Site is a private road and is unlikely to have direct views of the ORF due to the local rises in the landscape. Residences may see parts of the ORF from high points in the landscape.	Moderate	Low	Moderate—Low	The Proposal would be unlikely to have a substantial impact due to the Site being predominantly cleared, similar to surrounding agricultural industry and the distance of the ORF structures from the road and residences.
ProTen Chicken Farm (R6 and R7)	Views of construction work would be short-term and only visible from the south of the poultry farm (ProTen) buildings located directly north of the ORF. Minor vegetation removal will occur to the groundcover and 1 tree will be removed. Landscaping will occur around the Site and boundary fences.	Low	Low	Low	The area is rural and industrial by character. ProTen located to the north consists of industrial sized sheds. The views of the Proposal would be unlikely to impact ProTen as they would be similar to other agricultural industry and over 50mm from the Site.

As views into the Site are possible from a limited number of areas and the Proposal is in keeping with the agricultural industry and rural character of the overall area the assessment has found the visual amenity impact would be moderate-low and the proposal is unlikely to result in significant visual amenity impacts for nearby residents or from public vantage points.

The assessment determined that views of the ORF and ancillary structures would be most prominent from the closest point along Gidley Appleby Road. These locations were identified to have a potentially 'moderate-low' level impact on visual amenity, due to the proximity of Proposal site infrastructure, the sensitivity of the surrounding landscape and the utilisation of the area for industry and hobby farms.

6.12.4 Mitigation Measures

Visual impacts would be alleviated by establishing native vegetation to the east of Gidley Appleby Road, adjacent to the Proposal site to provide visual screening of the Proposal site and other design and control measures associated with the Proposal area. Given the distance to residential properties and landscape mitigations proposed, some minor impacts are expected on visual amenity in the local area as a result of changes to the rural landscape surrounding Gidley.

Table 6-45 Landscape Character and Visual Amenity Mitigation Measures

Ref	Mitigation measures
Operational Mitigation Measures	
V1	All structures with the potential to be visible from off-site locations will be finished in non-reflective natural tones which blend with the surrounding vegetation
V2	Roofing materials will be non-reflective due to the proximity of the site to the Tamworth Regional Airport.
V3	Any required lighting will be directed downwards in accordance with the Australian Standard AS4282 – Control of Obtrusive Effects of Outdoor Lighting (1997).
V4	Any open work or storage areas visible from a public place or street will be fenced by masonry materials or pre-coloured metal cladding of a minimum 2m height. Fencing will be located behind the building setback.
V5	Landscaping will be provided in the front 5m of street setback, side and rear setbacks where visible from public places, and areas adjacent to building entrances and customer access points.
V6	Landscaping will comprise of only low maintenance, drought and frost tolerant species. Planting will be provided in scale with the height and bulk of the building.

6.13 Bushfire

6.13.1 Introduction

A Bushfire Management Plan (BMP) was completed for the Proposal by ELA in order to:

- Provide specific overarching strategies to guide bushfire management of the Site.
- Enhance the resilience of future infrastructure associated with the Proposal.
- Protect human life from bushfires; and
- Mitigate the potential for ignition, spread and occurrence of bushfire within the Site causing damage to infrastructure and assets.

The BMP has been prepared in accordance with the Bush Fire Risk Management Planning Guidelines for Bush Fire Management Committees and the principles of the NSW Rural Fire Service Planning for Bush Fire Protection (PBP) 2006 (RFS, 2006b).

The BMP is provided in **Appendix K**, with a summary of its findings and recommendations provided below.

6.13.2 Existing Environment

The Site consists of mostly cleared land historically used for agricultural purposes. Grassland vegetation within and surrounding the site has the potential to sustain a bushfire or contribute to bushfire attack. Bushfire risk in the region is at its highest from October to March for the majority of the region. Prevailing weather conditions associated with the bushfire season in the Tamworth Bush Fire Management Committee (BFMC) are usually north-westerly winds with high daytime temperatures and low relative humidity. There is also the potential for dry lightning storms occurring throughout the area during the bushfire season.

Fire history

This Site is not located on Bushfire Prone Land identified by the NSW Rural Fire Service bush fire prone land mapping tool accessed on 19 August 2019. A fire has not been recorded on the Site over the last 15 years. The Tamworth BFMC area has on average 200 fires per year of which 15 can be considered major fires (Tamworth BFRMP 2011).

The main sources of ignition in the Tamworth BFMC area are:

- Lightning Strikes.
- Agricultural Burns / Practices.
- Malicious Fires.
- Escaped Pile Burns; and
- Machinery and Vehicles.

Legislation

TRC's primary legislative responsibilities for bush fire management are defined in the *Rural Fires Act 1997* (RF Act) where they have obligations to prevent the occurrence or spread of bush fires on and from their land.

The bushfire obligations can be extended to include Prevention, Preparedness, Response and Recovery (PPRR) which includes a wide array of resourcing and management actions, including:

- Management plans (inclusive of PPRR);
- Fuel management and appropriate access;

- Safety; and
- Cooperation with neighbours and fire authorities.

6.13.3 Impact Assessment

The likelihood and consequences of a bush fire impacting key assets involves consideration of ignition cause and patterns, slope, known fire paths, access, containment potential, fire run (size of vegetated area) and the vulnerability and resilience of the asset. Potential ignition sources from the Proposal include construction activities, composting operation and hot works.

The entire site will be managed to Asset Protection Zone (APZ) standard as maintaining intensively fuel reduced areas reduces the risk from potential ignition points. Raising knowledge and understanding of bushfire risks and management within personnel, contactors and stakeholders will also be undertaken alongside ensuring good relations with local fire agencies.

The risk of bushfire can be minimised by implementing mitigation measures including fuel management and building maintenance within the site, incident response preparedness, water supplies and ignition risk management. A Bush Fire Emergency Management and Evacuation bushfire will be developed for operation of the site. The risk of operational fire is addressed in Section 6.14.

6.13.4 Mitigation Measures

The following management and mitigation measures in Table 6-46 will be implemented to address potential impacts from the identified hazards.

Table 6-46: Bushfire Mitigation Measures

Ref	Mitigation measures
Construction mitigation measures	
BF1	Bushfire risks and management measures will be communicated to all workers on staff and incorporated in the CEMP
Operational mitigation measures	
BF2	The Proposal will be developed in accordance with current bushfire planning provisions to address the requirements of the Planning for Bush Fire Protection 2006, providing a level of protection to life and property.
BF3	A Bush Management Plan (BMP) will be prepared in accordance with the NSW Rural Fire Service document ‘Guide to developing a Bush Fire Emergency Management and Evacuation Plan’ and establish a close relationship with the NSW RFS Tamworth Regional Zone (located at Tamworth).
BF4	Restrict public access to the facility on extreme or catastrophic fire weather days or implement an adequate ‘trigger’ mechanism should bushfire conditions exacerbate.
BF5	Implement a 10 m asset protection zone around the perimeter of the Site.

BF6	Maintain access roads and tracks within the Site.
BF7	Remove combustible material, particularly litter in gutters and near buildings.
BF8	Remove excess amounts of fuel from garden areas (including leaf litter and organic mulch).
BF9	Review the BMP at least every 5 years to account for any revegetation or regeneration that occurs within and adjoining the Site.
BF10	All landscaped areas on-site should be maintained in accordance with: ○ RFS 2006a Bush Fire Environment Assessment Code for Asset Protection and Strategic Fire Advantage Zones. ○ RFS 2006b Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners. ○ RFS 2006c Standards for Asset Protection Zones. All pruning should be undertaken in accordance with AS4373 Pruning of Amenity Trees and RFS Standards for Asset Protection Zones (RFS 2006c).

6.14 Hazard and Risk

6.14.1 Introduction

This chapter assesses the potential impacts of the Proposal in relation to hazard and risk in accordance with the regulatory framework including:

- State Environmental Planning Policy No. 33 — Hazardous and Offensive Development (SEPP 33).
- Environmental Guidelines – Composting and Related Organics Processing Facilities – Issue 12 - Fire Management (DEC 2004).
- *Biosecurity Act 2015*

Further details are provided in the Hazard and Risk assessment in **Appendix L**.

6.14.2 Existing Environment

The Site occupies and is surrounded by rural lands that have been largely cleared for agriculture and have historically been used for crop production and improved pastures. A poultry farm occupies the neighbouring property to the north of the site.

There are currently no known hazards or risks associated with the site. This Site is not located on Bushfire Prone Land identified by the NSW Rural Fire Service bush fire prone land mapping tool (accessed on 19 August 2019) or in a Flood Planning Area under the Tamworth Local Environmental Plan 2010.

6.14.3 Impact Assessment

The Proposal will include:

- Storage of dangerous goods during construction and operation;
- Transport of organic material to and from the site during operation; and
- Storage and processing of organic material during operation.

SEPP 33 risk screening

SEPP 33 provides an approach to assessing projects for potentially hazardous and offensive development for the purpose of industry or storage. A development is considered potentially hazardous and requires a Preliminary Hazard Analysis (PHA) if the storage or transport of hazardous materials exceeds specific screening thresholds outlined in SEPP 33. In accordance with SEPP 33 a preliminary risk screening has been completed for the Proposal to determine whether a PHA is required to support the DA.

Preliminary risk screening has been completed in accordance with SEPP 33 and Applying SEPP 33 and can be found in **Appendix L**. To determine if the Proposal is potentially hazardous, the following information was collated and provided in Table 6-47:

- A list of all the hazardous materials used in the proposed development and the quantity of each.
- The dangerous goods classification for each material;
- The mode of storage used.
- The distance of the stored material from the Site boundary for any of the materials in dangerous goods classes 1.1, 2.1 and 3.
- The average number of annual and weekly road movements of hazardous material to and from the facility, and the typical quantity in each load.

Table 6-47 Material description and screening

Product	Dangerous Goods Classification (NTC 2018)	Quantities	Threshold	Storage location
Putrescible materials (including FO, GO, timber, liquid waste, offal, animal mortalities, paunch and animal manures and bedding).	Not applicable	35,000 tpa at capacity	N/A	This material will be transported to Site and stored within the Receivals area before being processed.
Recycled organic products (including composted soil conditioner and composted mulch). Note: This product has undergone 28 days pasteurisation.	Not applicable	19,000 tpa at capacity	N/A	This material will be stored in rows on a maturation pad adjacent to buildings and transported from Site.
Leachate	Not applicable	Leachate dam designed to store 16ML	N/A	In the leachate dam
Diesel storage for operation of plant and equipment	C1 combustible liquid	10,000L	N/A	Fuel Cube
Unleaded petrol	Class 3 PG II	200L	5000 kg	Equipment Shed
Oils and lubricants	Class 3 Flammable Liquid	Only household quantities will be stored on-site for minor general maintenance of plant and equipment	5000 kg	Equipment Shed
Wastewater for off-site disposal	Not applicable	Septic Collection Tanks with pump outs (as required) or potentially consideration of composting toilets.	N/A	Adjacent to the office
Pesticides and Herbicides	Not Applicable	Only household quantities will be stored on-site for minor general maintenance of plant and equipment	N/A	Within the facility

As shown in Table 6-47 above, the quantities of dangerous goods proposed to be stored on-site are well below the screening thresholds and do not trigger the requirement for a PHA. All identified dangerous goods will be stored over 100 metres from the closest property boundary (South) and over 800m metres to the nearest residential receiver. Other risk factors were also considered in **Appendix L**, no identified risk triggered the requirement of a PHA.

According to the Applying SEPP 33, a development is considered potentially offensive if the development requires a pollution control licence (e.g. EPL). If the licence conditions could not be met, the proposed development would be

considered offensive. An EPL is required for the Proposal, but it is expected that all conditions of the licence will be met.

Leachate contamination

Leachate is defined as any stormwater that contacts and may be grossly contaminated by raw or processed organic materials. Contaminants of concern include organic matter (biochemical oxygen demand – BOD), nutrients (in particular nitrogen and phosphorus), tannins and microbial pathogens. Leachate generally poses the greatest risk to water quality. Leachate is distinct from the relatively cleaner stormwater generated in other parts of the Site, that does not come in contact with bulk organic materials.

The facility has been designed to prevent mixing of relatively clean stormwater with the organics received and the composting areas. Any surface water that comes in to contact with the processing and / or storage areas is managed as leachate. All leachate runoff generated will flow to a leachate dam using gravity in dedicated drainage lines which will prevent leachate from contaminating the subsoil.

The leachate dam has been sized to accommodate 16ML as determined in the Water Balance (**Appendix N**). The leachate dam has been designed with a freeboard and spillway and levels will be monitored regularly alongside weather forecasts to ensure the dam does not overflow during rain events Leachate from the dam will be reused on-site for watering the unpasteurised batches of organic material.

Operational fire

Organics recycling facilities can pose a fire risk due to the temperatures reached during the composting process. Buildings and equipment used on-site by staff for construction and operations also increases the risk of human-caused fires. Therefore, a fire management strategy will be prepared for the Proposal in accordance with the Environmental Guidelines – Composting and Related Organics Processing Facilities (DEC 2004).

To control a fire outbreak, the proposed facility has been designed to include:

- A 10m wide asset protection zone around the perimeter of the Site for use as an access road for the fire brigade;
- Nine fire hydrants operating simultaneously. The Site will not use municipal reticulated water to provide the fire water so two fire tanks and two diesel engine powered fire pumps have been included in the design; and
- Sufficient coverage of the proposed office building and equipment shed will meet the requirements of the National Construction Code (NCC) 2016.

The Site will be managed in accordance with the Fire Safety Guideline: Fire safety in waste facilities (Fire and Rescue NSW2018). The maturation area has been sized to ensure the fire safety guidelines can be met. The storage and stockpiles including the windrows on the maturations pads, will be arranged so as to minimise build-up of a fuel and allow space for fighting access. Monitoring of moisture content and watering of composting material will be undertaken as required.

It is considered that with the implementation of the fire management strategy, mitigation measures, operational procedures and design of the facility, the risk associated with operational fire hazards will be managed to an acceptable level.

Bird Strike

The National Airports Safeguarding Framework: Guideline C (NASAG 2018) identifies organic waste and putrescible waste facilities as a high wildlife attraction risk and are considered incompatible within 3km of an airport, must be mitigated within 8km and monitored within 13km. The Site is located 10 km from the Tamworth Airport (YSTW) and therefore is required to be monitored. A wildlife hazard assessment has been completed by Avisure and can be found in **Appendix M**.

The existing Site is mostly cleared and provides minimal habitat for bird species. Organics-processing facilities with exposed, rapidly biodegradable organics may attract a large number of birds, particularly gulls and ibis; which can lead to noise problems and the spread of food scraps away from the Site. Additionally, due to the proximity of Tamworth

Regional Airport (approx. 10km) to the Site there is a potential risk of bird strikes with aircraft should the Site attract birds.

Consultation was undertaken with CASA and Tamworth Regional Airport regarding risks to aircraft and the airport operations and no major concerns were raised. Tamworth Regional Airport noted that roosting sites and likely flight paths of the local bird population are the most likely risk to aircraft including the flight path between the existing effluent re-use dam to the south west of the airport, Boltons Creek, Peel River and proposed ORF. Management and mitigation measures will be put in place to minimise the risk of attracting birds to the Site and therefore reducing the risk.

The risk of attracting birds is more likely on poorly managed sites that stockpile uncovered putrescible organics and release odour. The enclosed Receival Shed and TCS minimise the likelihood of attracting birds (Avisure 2018). The Proposal will significantly reduce these risks via the design of a fully enclosed Receival Shed and by undertaking pasteurisation within an enclosed TCS. Some residual risk will remain for birds to be attracted to the compost stockpiled on the maturation pad however this is considered to be a low risk due to this product having undergone the 28 day pasteurisation process.

Monitoring and management measures for the operational phase of the Site will include requirements for Site cleanliness, threshold numbers of birds (identified from annual monitoring), managing spillage from trucks and redundancies if there is an equipment failure.

Biosecurity

The *Biosecurity Act 2015* (Biosecurity Act) is in place for the prevention, minimisation and management of biosecurity risks such as pests, weeds, diseases and contaminants. The Biosecurity Act provides the framework to protect the community, environment and economy from adverse effects from biosecurity risks. This Proposal involves the transportation of organic material for processing to produce a compost product for commercial sale. This compost material will be applied to land in other areas.

The specific biosecurity risks associated with the Proposal relate to:

- Existing Site use (plant and animal land uses);
- Travel route of materials (organic materials and compost) and material types;
- Unforeseen contamination events (including flooding and storm events and transportation accidents);
- Pest and animal disease risks (e.g. Queensland fruit fly, potato cyst nematode, American Foulbrood disease with bees); and
- Organic input and the composting process which may host Phylloxera.

The processed output (product) is a beneficial and safe material to handle and transport. All materials will be handled as per relevant guidelines and standard operating procedures in separate buildings and hardstand areas as per the design of the Site.

A biosecurity risk assessment is presented as a table in **Appendix L**. Potential risks were identified based on existing Site conditions and activities related to the proposal including:

- Existing plant and animal land uses.
- Composting process.
- Transportation.
- Product transportation.
- Site operation.
- Extreme weather events (storm, flood & bushfire).
- Hosting or transporting pathogens, animals or plant diseases including Phylloxera.
- Attracting pests / vectors and birds.

Organic material will be from local and regional sources and will not be sourced from interstate or other regions. The transport routes to and from the Site will pass through agricultural, industrial (poultry farms) and residential areas.

Processing the organic material quickly within the enclosed facility and ensuring delivery trucks are properly sealed will minimise any biosecurity risks, such as the reproduction of Queensland fruit fly and American Foulbrood or Potato Cyst Nematode. The material received will be processed for approximately 10-12 weeks including 28 days pasteurisation within the TCS. During the first 14 days of the composting process, the organic material will be pasteurised at around 55-65 ºC to destroy pathogens and denature seeds.

The Proposal is located in an area that has been classified as a Phylloxera Biosecurity Zone and no organic material is expected to be carried to the Site from infested areas as the input material will be sourced from local domestic and commercial supplies (DPI 2018).

An assessment of the potential risk of bioaerosol and pathogen dispersion was undertaken for the proposal as shown in **Appendix L**. A review of the available studies on bioaerosol generation at composting facilities shows that bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind. The air dispersion modelling conducted for the Proposal shows that the levels of bioaerosols emitted would be diluted by approximately 1,000 times at a distance of approximately 200m and therefore would be at background levels at this distance. The poultry farm neighbouring the Site is located approximately 500m from the proposed facility. The bioaerosols from the Proposal would be diluted approximately 5,000 times or more before reaching the farm. Therefore, the impact from the Proposal on the nearest residents and poultry farm would be negligible.

The biosecurity risk assessment did not identify any significant hazards related to the various aspects of the development and operation of the proposed facility. The only hazards identified that could potentially lead to a significant risk were air pollution from emissions / dust or land and water pollution via leak or spill of leachate.

Implementation of the mitigation measures and design in accordance with relevant guidelines and other requirements is expected to adequately control these risks. The proposed operator will be responsible for applying risk treatment action to contain on-site and transported material. Risk treatments are identified in **Appendix L**.

6.14.4 Mitigation Measures

The following management and mitigation measures will be implemented to address potential hazards and risks.

Table 6-48 Mitigation measures for hazards

Ref	Mitigation Measures
Construction Mitigation Measures	
HR1	Review and adapt safety precautions into the design of the facility.
Operational Mitigation Measures	
HR2	In the Operational Management Plan include appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them. This should include implementation of additional leachate control measures and appropriate pathogen control measures.
HR3	In accordance with the *Environmental Guidelines – Composting and Related Organics Processing Facilities – Issue 12 - Fire Management* (DEC, NSW) and *Fire Safety Guideline: Fire safety in waste facilities* (Fire and Rescue 2018), a fire management strategy will be prepared for the Proposal. The fire management strategy should identify the following: • The potential causes of fire at the composting facility;

Ref	Mitigation Measures
	• The procedure to follow, persons responsible, and equipment to be used in the event of a fire. This will include on-site resources and external resources (such as the Rural Fire Service), and details of how the procedure will operate on a 24-hour-a-day basis; • The maintenance schedules for all fire-fighting equipment and facilities. At a minimum, all equipment and facilities should be visually checked for damage on a weekly basis, and test-operated on a quarterly basis; • Details of all the fire-fighting equipment that will be installed at the flammable store and at Site buildings; • How all fire-fighting equipment will be clearly signposted and how access to it will be ensured at all times; • Details of the firebreaks to be constructed and maintained around all filled areas, stockpiles of combustibles, gas extraction equipment and Site buildings; • Management of storage and stockpiles; and Training of facility staff in fire-fighting techniques.
HR4	The risk register will continue to be maintained and developed to review ongoing activities and risks.
HR5	Develop and adapt standard operating processes / procedures based on experience, requirements and ongoing monitoring and measurement of risks.
HR6	The Biosecurity Act will be taken into consideration when planning the detailed design of the facility and quality operational process controls to ensure biosecurity measures are upheld.
HR7	A Waste Management Plan will be prepared for the Site including measures to ensure no organic material is imported to Site from Phylloxera infested areas.
HR8	Ensure biodegradable organics and compost stockpiles are well managed so as to minimise odour generation and avoid attraction of nuisance pests and vectors, including birds.
HR9	Prepare a pest and weed management plan (PWMP) to manage pest animals, reduce the spread of weeds and control weeds on-site and on soil stockpiles and adjacent roadways. The PWMP should include mitigation measures such as: the checking and cleaning of vehicles prior to entering and leaving the Site, as well as disposing of known weeds appropriately, and monitoring of birds and other animals and insects.
HR10	Monitoring of bird numbers visiting the Site and potential roosting locations on-site will be conducted. Should increased numbers of birds or roosting sites be observed, the airport will be notified, and the waste management measures will be reviewed and improved.

6.15 Socio Economic Considerations

6.15.1 Introduction

This development will have a positive effect on the region and would improve the Tamworth Region by:

- Diverting and recovering an organic material into a useable output material;
- Reducing the generation of methane in the atmosphere by diverting organics from landfill and treating the material in an aerobic process; and
- Decreasing the environmental and social impacts of the Proposal by utilising proven technology in the form of an enclosed TCS.

This section discusses the social and economic existing environment of Tamworth LGA and how the Proposal would affect the socio-economics of the region.

6.15.2 Existing Environment

TRC was established in March 2004, amalgamating the northern NSW shires of Barraba, Manilla, Nundle and Parry and the city of Tamworth. It is one of the biggest councils in inland NSW, with a population of over 62,156 (ABS 2019) spread over an area three times as large as the Sydney basin. Tamworth's population density is 6 people per km^2, which is one of the most populated regional cities in NSW.

The Tamworth region has a prosperous economy based on 15.4% Manufacturing, 14.1% Retail trade, 11.5% Education and training, 10.3% Public administration and safety, 7.7% Agriculture, forestry and fishing, 7.7% Other services, 7.7% Wholesale trade, 6.4% Accommodation and food services, 3.8% Arts and recreation services. Population growth for the region is on 1.04% pa for 2018 (in comparison to NSW which is 1.6% pa) for 2018 (DPIE, 2019). The Tamworth region has a high density of agricultural industry and as such, a growing organic volume is expected, which will need to be managed.

Currently the only composting facility in the local area (located at the FRWMF) is constrained to meet this growth due to the following factors:

- It is at full capacity;
- It only receives GO and is not licensed to receive FO or other Category 3 organic materials;
- It lacks suitable land for expansion of the existing facility;
- It lacks suitable buffer zones required to establish an ORF that processes FO, Go and Category 3 organic materials; and
- Residential land is encroaching on the east, north and west of the FRWMF.

6.15.3 Impact Assessment

Social impacts

The potential adverse social impacts associated with the Proposal relate to the general amenity aspects including visual, noise, air quality, odour and traffic during construction and operation.

The potential impacts of these social amenity aspects on sensitive receivers are assessed in detail in other sections of Chapter 6 along with a range of management measures proposed to mitigate these potential impacts.

The potential for adverse social impacts has been significantly limited by the design of the Proposal which is in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004) and the options assessment completed by TRC.

The Proposal will be located a reasonable distance from large population centres and individual rural residences. The Proposal area is situated with buffer distances exceeding 700m to neighbouring residences which will significantly reduce the risk of impacts upon surrounding residents from operation of the facility.

One of the social benefits of recycling is the creation of a sense of civic pride and satisfaction felt through participation in recycling. This Proposal will provide an opportunity to educate the general public about organics recovery and recycling. The newly introduced FOGO kerbside collection system will initially require more effort by everyone at the household and commercial premises and will therefore increase community's overall sense of ownership to and involvement in the Proposal.

Economic impacts

A circular economy approach, provided by completing the organic loop (with organic materials generated by residents and commercial businesses being converted into a beneficial compost product they can use) will add value to the local agricultural industry by reducing the need for artificial soil conditioners. Recycling organics is economically important and unique in that it provides resources or inputs to a range of industries (e.g. nurseries, agriculture, landscaping businesses, TRC, residents) without depleting natural resources and reducing the need for artificial products.

The Proposal will involve capital investment in excess of $10 million in the region during construction and full-time employment of six persons during operation. The Proposal will also generate economic flow on effects through business and employee expenditure on goods and services in the local community as well as the future FOGO kerbside collection service contract which will involve education, design, marketing, consulting and infrastructure (bins) expenditure.

Financial modelling suggests that the Proposal (with the grant funding received) can achieve very competitive gate fees compared to landfill disposal and competitive gate fees compared to similar regional facilities. The Proposal will also provide composted organic product for sale to the public at competitive prices. This offers the Tamworth community excellent value for money over the life of the Proposal.

Mitigation measures addressing potential social amenity impacts are provided within this EIS. Provided that the recommended safeguards are implemented, the social impacts of the Proposal are considered to be acceptable, particularly when considered in the context of the economic contribution to the local and regional economy.

6.15.4 Mitigation Measures

Table 6-49 outlines the mitigation measures for potential impacts relating to socio-economic impacts.

Table 6-49 Socio-economic Impact Mitigation Measures

Reference	Mitigation Measure
Construction mitigation measures	
SE1	Any construction related complaints received during the project will be recorded and attended to promptly in accordance with the contractor complaints management procedure and register.
SE2	Roads and Maritime Services, relevant agencies, as well as businesses and residences within 1km of the proposed facility will be notified in writing at least 24 hours prior to the start of the construction works. This would be conducted by the contractor.
Operational mitigation measures	
SE3	A complaint handling procedure and register will be implemented to assist in recording and managing potential conflict with the local community during operations. This would be conducted by the contractor.

6.16 Cumulative Impacts

6.16.1 Introduction

Cumulative impacts are the interacting developments and activities such as construction or other works within the locality of the surrounding vicinity of the Proposal that may impact the Proposal in an environmental, social or economic way.

6.16.2 Impact Assessment

A search of the DPIE development assessment tracking system Major Projects, TRC DA Tracking website and the Joint Regional Planning Panel (JRPP) Development and Planning Register on the 27 August 2019 did not identify any major projects in the vicinity of the Proposal.

6.16.3 Existing Environment

TRC DA Tracking website identified the following DAs in the listed suburbs of Tamworth LGA.

Table 6-50: DAs within the vicinity of the proposal area

Location/Suburb	Development Application
Tamworth	A search of current Tamworth DAs within the suburbs of Gidley, Appleby, Moore, Hallsville, Moore Creek and Moss Vale of the past 6 months identified a number of smaller scale development proposals including the construction of carports, dwelling extensions, in ground pools, demolition of dwellings and installation of solar on non-commercially owned land. The majority of DAs within the last 6 months are related to tenancy fit out of shops, installation of new signage and windows, demolition of existing buildings, construction of a building, site remediation, installation of solar panels and connection to council sewer.
Gidley	• DA0192/2012 – 244-346 Gidley Siding Road Gidley NSW. Expansion of Poultry Breeding Farm Complex • DA/2018-0586 – 593 Appleby Lane Gidley NSW 2340: Solar Panels Approved under delegation. 9/2/2018 • DA2018-0586 – 593 Gidley Appleby Lane Gidley: Staged demolition of sixteen Poultry Sheds and Associated Structures. Approved under delegation. 25/09/2018.
Appleby	• Non-commercial dwelling construction and associated modification of dwelling structures.
Joint Regional Planning Panel (JRPP)- Northern	A search of TRC in the development and planning register in August 2019 and identified 30 DAs or development modifications from 2009 to 2019. Three DAs were submitted from 2017 to 2019 include: • Tamworth Public School located at Upper Street, East Tamworth. The DA 2019NTH009 refers to construction works including demolition and construction of two new buildings at Tamworth Public School lodged on 29 November 2018 which is located approximately 14km south east from the Property boundary. The proposed DA received determination on 25 March 2019. Due to the distance from the Property boundary, the impacts are insignificant.

Location/Suburb	Development Application
	• 9MW solar farm located at 72 Wallamore Road, Taminda. The other DA is the construction and use of a 9MW solar farm and associated infrastructure (2019NTH008 DA). The proposed development is located approximately 12km south east of the Property boundary. The proposed DA received determination on 24 July 2019. Should both developments be in the construction stage there is likely to be a higher generation of traffic utilising Wallamore Road. • Seniors Living Development and demolition of existing dwelling located at 372 Moore Creek Road North Tamworth NSW 2340. The DA 2017NTH023 DA refers to the Demolition of Existing Dwelling and Construction of a Residential Aged Care Facility and 57 Self Contained Dwellings for Seniors and Community Centre. The proposed development is located approximately 9.5km south east of the Property boundary. The proposed DA received determination on 16 May 2018. Due to the distance from the Property boundary and the proposed Seniors living development, the impacts are nil to minimal. There are no significant cumulative developments within the nearby vicinity of the Property boundary.
Major Projects website	A search of the major projects website identifies one DA within 10 km of the Property boundary. The DA is for Baiada Poultry Processing Facility (DA 53/97 MOD 6) located at Oakburn, Oxley Highway. The Site is located approximately 10km from the Property boundary. This Site will to increase processing volume of the plant from 160 tonnes to a maximum of 180 tonnes daily and no cumulative impacts are expected to the environment as a result of the Proposal.

6.16.4 Mitigation Measures

Table 6-51 outlines the mitigation measures for potential impacts relating to cumulative projects and associated impacts.

Table 6-51 Cumulative Impact Mitigation Measures

Reference	Mitigation Measure
Cumulative Impact Mitigation Measures	
CI1	The CEMP would be updated as required to incorporate potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new work begins or if complaints are received.
C12	The CEMP would address any additional construction and heavy vehicle traffic causing congestion and additional traffic management during construction causing additional congestion and delays.

7. Consolidated Summary of Management and Mitigation Measures

Throughout this EIS, a number of management and mitigation measures have been identified in order to minimise adverse environmental, social and economic impacts that could potentially arise from the Proposal. These management and mitigation measures would be implemented during the construction and operation of the Proposal. The identified management and mitigation measures will be incorporated into contractual arrangements with future contractors for construction and operation of the Proposal.

7.1.1 Construction Measures

The management and mitigation measures in the table below apply to the construction phase of the Proposal.

Table 7-1 Construction Management and mitigation measures

Ref	Mitigation measures
Air quality and odour	
A1	Activities shall be assessed during adverse weather conditions and modified as required to reduce dust generation (e.g. cease activity where reasonable levels of dust cannot be maintained).
A2	Engines to be switched off when not in use for any prolonged period
A3	Vehicles and plant will be fitted with pollution reduction devices wherever possible.
A4	Maintain and service vehicles according to manufacturer's specifications.
A5	Haul roads / transport routes to be sited away from sensitive receivers where possible.
A6	Minimise area of exposed surfaces.
A7	Water suppression on exposed areas and stockpiles.
A8	Minimise amount of stockpiled material.
A9	Locate stockpiles away from sensitive receivers.
A10	Apply barriers, covering or temporary rehabilitation.
A11	Progressive staging of construction activities.
A12	Rehabilitation of completed sections as soon as practicable.
A13	Keep ancillary vehicles off exposed areas.

Ref	Mitigation measures
A14	Reduce drop heights from loading and handling equipment.
A15	Watering of haul roads (fixed or mobile) when required.
A16	Sealed haul roads to be cleaned regularly.
A17	Restrict vehicle traffic to designated routes that can be managed by regular watering.
A18	Impose speed limits.
A19	Wheel wash, grids or coarse aggregate near exit points to minimise dirt track out.
A20	Street cleaning to remove dirt tracked onto sealed roads.
A21	Covering vehicle loads when transporting material off- site.
Noise and vibration	
N1	Prepare and implement a Construction Environmental Management Plan to manage potential noise impacts including: • Description of responsibilities regarding the management of noise emissions from the Site. • Any relevant conditions / requirements of consent / approval. • Methodologies adopted to monitor noise emissions from the Site against relevant criteria; and • A mechanism for assessing noise monitoring results against the relevant noise criteria.
N2	Implement boundary fences / retaining walls as early as possible during construction to maximise their attenuation benefits to surrounding receivers.
N3	Toolbox and induction of personnel prior to shift to discuss noise control measures that maybe implemented to reduce noise emissions to the community.
N4	Where possible use mobile screens or construction hording to act as barriers between construction works and receivers.
N5	All plant should be shut down when not in use. Plant to be parked / started at farthest point from relevant assessment locations when practicable.
N6	Operating plant in a conservative manner (no over-revving).
N7	Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site.

Ref	Mitigation measures
N8	Selection of the quietest suitable machinery available for each activity.
N9	Avoidance of noisy plant / machinery working simultaneously where practicable.
N10	Minimisation of metallic impact noise.
N11	All plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm.
N12	Undertake letter box drops to notify receivers of potential works.
Traffic and transport	
T1	The ancillary road works (signage and access road) should be completed prior to the construction of the Proposal.
T2	Traffic management plans for construction shall be developed in accordance with Roads and Maritime Guidelines and the Australian Standard AS1742.3.
Biodiversity	
B1	During construction all staff and contractors should: • Operate only within the approved disturbance limits. • Avoid disturbing any native vegetation adjacent to the subject Site by clearly delineating vegetation to be retained. • If disturbance is required beyond the pre-determined extent a Site inspection shall be undertaken by a qualified ecologist to determine if any threatened flora or fauna or threatened species habitat may be impacted and to undertake appropriate additional impact assessments.
B2	Prepare and implement a Construction Environmental Management Plan which includes: • Strict erosion and sediment control measures in areas where disturbance is taking place, particularly around drainage lines. • Weed management. • Appropriate environmental controls to manage biodiversity during construction.
B3	To mitigate the impacts of fauna habitat removal, any clearing of habitat trees should be undertaken in the presence of a suitably qualified and trained ecologist to facilitate relocation of any fauna.
Aboriginal Cultural Heritage	
AH1	A Chance Finds Protocol which addresses unexpected aboriginal heritage finds will be included in the Construction Environmental Management Plant to be completed by the construction contractor.
AH2	If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, the OEH must be notified under section 89A of the NPW Act.

Ref	Mitigation measures
	Appropriate management and avoidance or approvals under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.
AH3	In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.
AH4	A Site visit with representatives of the TLALC should be conducted following Site preparation (i.e. removal of cover crop) and prior to significant ground disturbance.
Non-Aboriginal Heritage	
H1	A Chance Finds Protocol which addresses unexpected non-Aboriginal heritage finds will be included in the Construction Environmental Management Plan to be completed by the construction contractor.
H2	If an item (or suspected item) of heritage is discovered during construction, all work in the area of the find will cease immediately and the Chance Finds Protocol implemented including notifying an officer from the Heritage branch of OEH immediately and seeking advice for management of the object.
Soils and Geology	
S1	Prepare and implement a Soil and Water Management Plan for construction, which includes appropriate erosion and sediment controls in accordance with Managing urban stormwater: soils and construction, Vol. 1 and 2 (Landcom, 2004). At a minimum, the erosion and sediment plan should address: • Measures to minimise soil disturbance; • Management of stormwater, including diversion of clean stormwater around disturbance areas and collection of dirty runoff into appropriate sediment traps; • Management of stockpiles; • Temporary erosion controls to be employed in high erosion hazard areas such as stormwater drains and steep batters; • Specific measures to stabilise surfaces conveying concentrated water flows, to control erosion; • Installation of appropriately designed and sized sediment controls downslope of disturbed areas to prevent sediment-laden runoff; • Sediment basin requirements; • Measures to control dust generation; • Progressive stabilisation and rehabilitation of disturbed areas following completion of construction; and • Regular inspection and maintenance of erosion and sediment control measures.
S2	Ensure that any imported fill free from contamination and weed seeds or propagules.
S3	Prepare and implement a Spill Prevention and Response Procedure to address accidental spills and leaks from machinery and vehicles.

Ref	Mitigation measures
S4	Incorporate sediment, stormwater, leachate and dust control measures into the design of the facility including: • Appropriate stormwater management infrastructure; • Stabilising soil surfaces disturbed by construction, through landscaping or sealing; • Appropriate sealing of all areas generating, conveying or storing leachate waters, to prevent contamination of underlying soils and groundwater; and • Hardstand pavements for trafficable areas of the Site
Surface Water Hydrology and Storm Water Management	
SW1	An Erosion and Sediment Control Plan will be developed as part of the construction environmental management plan for the Proposal in line with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004; the "Blue Book").
Groundwater	
GW1	The Construction Environmental Management Plan will include measures to avoid interception of groundwater during excavation of the Proposal.
GW2	The Construction Environmental Management Plan will include a procedure that outlines the steps required if groundwater is unexpectedly encountered during construction.
Leachate and Wastewater Management	
WW1	The Construction Environmental Management Plan will include measures for managing sewage wastes during construction (e.g. Portaloos).
WW2	Water Balance to be reviewed by the operator prior to operation based on any changes to inputs and water sources that occur during detailed design.
Waste management	
W1	A Waste Management Plan (WMP) will be prepared as part of the CEMP to manage any construction waste. The plan will identify: • Types and volumes of waste likely to be generated • The procedure for assessing, classifying and storing waste in accordance with the EPA's Waste Classification Guidelines (EPA, 2014) • Storage and treatment of waste (including stockpiles) • Methods of transport and disposal of wastes (including waste that possesses hazardous characteristics) to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment • Opportunities for reducing waste, re-using materials and increasing recycling • Requirements for compliance with the Waste Avoidance and Resource Recovery Act 2001 • The Resource Recovery Orders and Exemptions requirements applicable to the waste on-Site

Ref	Mitigation measures
	• Monitoring, record keeping and reporting e.g. waste tracking data demonstrating the lawful disposal of contaminated products, waste or residues generated at the facility.
W2	Waste management strategies and mitigation measures will be communicated to all employees and contractors during Site induction, prior to commencing works at the Site.
W3	Waste oil, hydraulic and other hazardous materials will be stored in secure containers and kept in a bunded and covered area. Hazardous wastes will be transported to a facility that is appropriately licensed to receive and recycle or treat hazardous wastes. Hazardous wastes will be tracked through transport to their final destination and the EPA notified of these waste movements.
W4	A schedule will be created with the temporary amenity hire contractor to remove sewage.
W5	All records demonstrating lawful disposal of waste are required to be kept for at least six years.
W6	FRWMF to be given appropriate notification before any large quantities of waste are deposited at the Facility.
Bushfire	
BF1	Bushfire risks and management measures will be communicated to all workers on staff and incorporated in the CEMP
Hazard and risk	
HR1	Review and adapt safety precautions into the design of the facility.
Socio Economic Considerations	
SE1	Any construction related complaints received during the project will be recorded and attended to promptly in accordance with the contractor complaints management procedure and register.
SE2	Roads and Maritime Services, relevant agencies, as well as businesses and residences within 1km of the proposed facility will be notified in writing at least 24 hours prior to the start of the construction works. This would be conducted by the contractor.
Cumulative Impacts	
CI1	The CEMP would be updated as required to incorporate potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new work begins or if complaints are received.
C12	The CEMP would address any additional construction and heavy vehicle traffic causing congestion and additional traffic management during construction causing additional congestion and delays.

7.1.2 Operation Measures

The measures in the table below apply to the construction phase of the Proposal.

Table 7-2

Ref	Mitigation measures
Air quality and odour	
A22	An Operational Environmental Management Plan (OEMP) will be prepared for the Proposal with a Waste Management Plan (WMP) Management measures to minimise odour and maintain plant and infrastructure on-site will be included in the plan.
A23	All sorting and receival of materials to occur within the enclosed Receival Shed and doors to the shed are to remain closed when not in use.
A24	Co-ordinate the delivery schedule to avoid a queue of incoming or outgoing trucks for extended periods of time.
A25	Engines of on-site vehicles and plant are to be switched off when not in use.
A26	Vehicles delivering, and handling material are to stick to the formed roads / paths to minimise fugitive dust and also spillage and potential fugitive odour.
A27	Spill management procedures to ensure immediate clean-up of any spill.
A28	Maintain an odour complaint logbook and in the event of a complaint conduct an immediate investigation of any odour sources, together with appropriate actions to eliminate any identified excessive odour.
A29	Vehicles and plant are to be fitted with pollution reduction devices in accordance with manufacturer specifications.
A30	Maintain and service vehicles according to manufacturer's specifications.
A31	Regularly clean all hard stand areas.
A32	Avoid significant handling of material during poor dispersion conditions where possible (e.g. undertake pile turning in the middle parts of the day in preference to the evening or early morning).
Noise and vibration	
N14	Prepare and implement a Noise Management Plan (NMP) to be included within the Operational Environmental Management Plan to manage potential noise impacts including: • provide the ORF employees and contractors with a description of their responsibilities regarding the management of noise emissions from Site;

Ref	Mitigation measures
	• address any relevant conditions/requirements of consent/approval; • describe the methodologies adopted to monitor noise emissions from the Site against relevant criteria; • provide a mechanism for assessing noise monitoring results against the relevant noise criteria; and • provide a means for the establishment of best practice management with respect to minimising noise emissions/impacts to the broader community.
N15	Operational working hours would be restricted to 8am to 4:45pm Monday to Sunday
N16	Prepare and implement a complaints management plan including a contact phone number for neighbours to contact the operator should they have concerns over noise emissions.
Traffic and transport	
T3	Traffic management plans for operation shall be developed in accordance with Roads and Maritime Guidelines and the Australian Standard AS1742.3.
Biodiversity	
B4	Prepare a pest and weed management plan (PWMP) to manage pest animals, reduce the spread of weeds and control weeds on-site and on soil stockpiles and adjacent roadways. The PWMP should include mitigation measures such as: the checking and cleaning of vehicles prior to entering and leaving the Site, as well as disposing of known weeds appropriately, and monitoring of birds and other animals and insects.
B5	Prepare and implement an Operational Environmental Management Plan to address operational activities which have the potential to impact on biodiversity including appropriate leachate management measures.
Soils and Geology	
S5	Prepare and implement an Operational Environmental Management Plan which provides erosion and sediment controls, stormwater and sediment runoff controls, chemical and machinery storage and management and dust controls.
S6	Operational Environmental Management Plan is to includes the following plans and procedures at a minimum to control and prevent soils related impacts: • Leachate Management Plan; • Stormwater Management Plan; • Spill Prevention and Response Plan; • Machinery Maintenance Procedures; and • Dust control procedure.

Ref	Mitigation measures
Surface Water Hydrology and Storm Water Management	
SW2	The water management system will be designed in accordance with the EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
SW3	The facility will be designed and constructed such that the grades do not cause or permit any incidental pooling of water on the premises.
SW4	Separate drainage collection and treatment systems will be maintained for clean stormwater runoff and processing area leachate.
SW6	An operational water management plan will be developed and include procedures to manage the capture, storage, reuse and discharge of stormwater and leachate.
SW7	Procedures for management of potential spills of hazardous materials will be included in the water management plan.
SW8	Prepare appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them.
Groundwater	
GW3	A leachate capture and management system will be designed and constructed for the processing, storage and receival areas in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
GW4	A groundwater monitoring program will be developed to include regular monitoring downslope of the leachate dam to detect potential contamination, with comparison to a reference bore over time.
Leachate and Wastewater Management	
WW3	All water that comes into contact with the organic processing area will be collected, stored and managed as leachate in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
WW4	The leachate and stormwater storage dams will be designed in accordance with EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004).
WW5	A wastewater management plan will be prepared that illustrates all wastewater systems on-site and provides operational management procedures and responsibilities to ensure that adequate pollution prevention procedures are in place.
WW6	Emergency response procedures will be prepared for situations where overtopping, breach or other failure of the leachate dam occurs.
WW7	A procedure will be developed to ensure adequate capacity is available in the leachate dam for capture of the 1 in 10yr, 24-hour storm, while allowing additional temporary storage of reclaimed water for on-site reuse. The procedure will include regular monitoring of weather forecasts and water levels in the leachate dam to minimise the risk of leachate dam overtopping during rain events.

Ref	Mitigation measures
WW8	All Site staff will be appropriately trained to enact pollution prevention procedures.
WW9	Leachate water will be recycled for use in the processing of organic materials.
WW10	An Onsite Sewage Management (OSM) System shall be installed to manage sewage wastes during operations and would be outlined in an application to Council under Section 68 of the Local Government Act 1993, or in the EPL application.
WW11	The wheel wash will include a gross pollutant trap with an oil boom or similar prior to discharge of any overflow.
Waste Management	
W7	All records demonstrating lawful disposal of waste are required to be kept for at least six years.
W8	All sampling and classification records will be retained for the life of the Proposal to demonstrate compliance with the EPA's Waste Classification Guidelines. These records will be readily accessible for inspection by regulatory authorities such as council, Office of Environment and Heritage (OEH), EPA and WorkCover NSW.
W9	Waste generated from the Proposal will be managed in accordance with the principles of the waste hierarchy. An Operational Environmental Management Plan (OEMP) will be prepared for the proposed facility with a Waste Management Plan that includes the following: • Mitigation measures and a procedure for safely and appropriately managing any unexpected finds/contaminated waste. • Before dispatching any waste from the facility, the waste material will be assessed and classified in accordance with the NSW EPA Waste Classification Guidelines Part 1: Classification of Waste (2014). • Any waste dispatched from the premises is to be sent to a facility that can legally accept the waste, with adequate notice of large loads advised to the facility ahead of receival. • The proposed facility will comply with the relevant EPL and/or waste-tracking requirements under the Protection of the Environment Operations Act (POEO) for any wastes assessed or classified as hazardous waste, industrial waste or 'Group A' waste. • If the waste to be transported requires tracking, approval to transport the waste must be obtained prior to transport in the form of a consignment authorisation issued by a person authorised to do so. A transport certificate must be created which will accompany the waste while it is being transported. The certificate is to be completed when the waste arrives at its destination and has been processed by the receiving facility; and • The facility will keep documented evidence e.g. waste tracking data demonstrating the lawful disposal of contaminated products, waste or residues generated at the facility.
Visual Amenity	
V1	All structures with the potential to be visible from off-site locations will be finished in non-reflective natural tones which blend with the surrounding vegetation
V2	Roofing materials will be non-reflective due to the proximity of the site to the Tamworth Regional Airport.

Ref	Mitigation measures
V3	Any required lighting will be directed downwards in accordance with the Australian Standard AS4282 – Control of Obtrusive Effects of Outdoor Lighting (1997).
V4	Any open work or storage areas visible from a public place or street will be fenced by masonry materials or pre-coloured metal cladding of a minimum 2m height. Fencing will be located behind the building setback.
V5	Landscaping will be provided in the front 5m of street setback, side and rear setbacks where visible from public places, and areas adjacent to building entrances and customer access points.
V6	Landscaping will comprise of only low maintenance, drought and frost tolerant species. Planting will be provided in scale with the height and bulk of the building.
Bushfire	
BF2	The Proposal will be developed in accordance with current bushfire planning provisions to address the requirements of the Planning for Bush Fire Protection 2006, providing a level of protection to life and property.
BF3	A Bush Management Plan (BMP) will be prepared in accordance with the NSW Rural Fire Service document 'Guide to developing a Bush Fire Emergency Management and Evacuation Plan' and establish a close relationship with the NSW RFS Tamworth Regional Zone (located at Tamworth).
BF4	Restrict public access to the facility on extreme or catastrophic fire weather days or implement an adequate 'trigger' mechanism should bushfire conditions exacerbate.
BF5	Implement a 10 m asset protection zone around the perimeter of the Site.
BF6	Maintain access roads and tracks within the Site.
BF7	Remove combustible material, particularly litter in gutters and near buildings.
BF8	Remove excess amounts of fuel from garden areas (including leaf litter and organic mulch).
BF9	Review the BMP at least every 5 years to account for any revegetation or regeneration that occurs within and adjoining the Site.
BF10	All landscaped areas on-site should be maintained in accordance with: ○ RFS 2006a Bush Fire Environment Assessment Code for Asset Protection and Strategic Fire Advantage Zones. ○ RFS 2006b Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners. ○ RFS 2006c Standards for Asset Protection Zones. All pruning should be undertaken in accordance with AS4373 Pruning of Amenity Trees and RFS Standards for Asset Protection Zones (RFS 2006c).

Ref	Mitigation measures
Hazard and risk	
HR2	In the Operational Management Plan include appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them. This should include implementation of additional leachate control measures and appropriate pathogen control measures.
HR3	In accordance with the *Environmental Guidelines – Composting and Related Organics Processing Facilities – Issue 12 - Fire Management* (DEC, NSW) and *Fire Safety Guideline: Fire safety in waste facilities* (Fire and Rescue 2018), a fire management strategy will be prepared for the Proposal. The fire management strategy should identify the following: • The potential causes of fire at the composting facility; • The procedure to follow, persons responsible, and equipment to be used in the event of a fire. This will include on-site resources and external resources (such as the Rural Fire Service), and details of how the procedure will operate on a 24-hour-a-day basis; • The maintenance schedules for all fire-fighting equipment and facilities. At a minimum, all equipment and facilities should be visually checked for damage on a weekly basis, and test-operated on a quarterly basis; • Details of all the fire-fighting equipment that will be installed at the flammable store and at Site buildings; • How all fire-fighting equipment will be clearly signposted and how access to it will be ensured at all times; • Details of the firebreaks to be constructed and maintained around all filled areas, stockpiles of combustibles, gas extraction equipment and Site buildings; • Management of storage and stockpiles; and Training of facility staff in fire-fighting techniques.
HR4	The risk register will continue to be maintained and developed to review ongoing activities and risks.
HR5	Develop and adapt standard operating processes / procedures based on experience, requirements and ongoing monitoring and measurement of risks.
HR6	The Biosecurity Act will be taken into consideration when planning the detailed design of the facility and quality operational process controls to ensure biosecurity measures are upheld.
HR7	A Waste Management Plan will be prepared for the Site including measures to ensure no organic material is imported to Site from Phylloxera infested areas.
HR8	Ensure biodegradable organics and compost stockpiles are well managed so as to minimise odour generation and avoid attraction of nuisance pests and vectors, including birds.

Ref	Mitigation measures
HR9	Prepare a pest and weed management plan (PWMP) to manage pest animals, reduce the spread of weeds and control weeds on-site and on soil stockpiles and adjacent roadways. The PWMP should include mitigation measures such as: the checking and cleaning of vehicles prior to entering and leaving the Site, as well as disposing of known weeds appropriately, and monitoring of birds and other animals and insects.
HR10	Monitoring of bird numbers visiting the Site and potential roosting locations on-site will be conducted. Should increased numbers of birds or roosting sites be observed, the airport will be notified, and the waste management measures will be reviewed and improved.
Socio- economic Considerations	
SE3	A complaint handling procedure and register will be implemented to assist in recording and managing potential conflict with the local community during operations. This would be conducted by the contractor.

8. Conclusion

The Proposal, identified as a designated and integrated development has been subject to an environmental impact assessment under Part 4 of the EP&A Act. This EIS has examined and taken into account all matters affecting or likely to affect the environment by reason of the proposed activity.

The environmental impact assessment that was undertaken concludes that the Proposal could potentially have short term and/or limited impacts on:

- Air quality and odour
- Water and wastewater management
- Hazards such as biosecurity, bird strike and operational fire
- Noise and vibration
- Traffic and transport
- biodiversity
- Aboriginal Heritage
- Soils, and
- Visual amenity

Appropriate mitigation and management measures outlined in Chapter 7 will be carried out during the construction, operation and decommissioning phases.

8.1 Justification of the Proposal

The Proposal will provide the opportunity for additional organic materials to be diverted from landfill in Tamworth and the surrounding region. This would increase the life of the landfill at FRWMF, improve local recycling rates and contribute towards the sustainability of the Tamworth Region. It will also provide a more environmentally sustainable alternative to mined top-soil and chemical fertilisers for industry across NSW.

The Proposal will provide socioeconomic benefits by converting organic material generated by residents and farmers into a beneficial compost product they can use. This will add value to the local agricultural industry by reducing the need for artificial soil conditioners. The Proposal will involve capital investment in excess of $10 million in the region during construction and full-time employment of six persons during operation.

The Proposal will be located a reasonable distance from large population centres and individual rural residences. The Proposal area is situated with buffer distances exceeding 800m to neighbouring residences which will significantly reduce the risk of impacts upon surrounding residents from operation of the facility.

8.2 Ecologically Sustainable Development

8.2.1 The Precautionary Principle

The precautionary principle means that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. Implementing the precautionary principle includes:

- Careful evaluation to avoid serious or irreversible damage to the environment wherever practicable.
- An assessment of the risk-weighted consequences of various options.

This EIS assesses environmental aspects and impacts associated with the Proposal with the purpose of eliminating

(where practicable) and reducing the risk of serious and permanent impacts on the environment.

A number of alternatives were assessed during the development of the proposal. These include:

- Upgrading the existing facility at FRWMF.
- Transport of organics materials to the closest ORF licensed to receive food organics (FO)
- “Do nothing” option.
- A new ORF

An options assessment process, including Site inspections and a Site selection feasibility assessment, was undertaken to determine the most appropriate option in consideration of a number of environmental, social and economic factors. The assessment process determined that building a new facility at the Site was the preferred option.

Specialist studies were undertaken to provide accurate information to assist with the evaluation and development of the Proposal as shown in Chapter 6.

8.2.2 Intergenerational Equity

The intergenerational equity principle recognises that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The Proposal will improve environmental performance of resource recovery in the Tamworth LGA, with putrescible organic material converted into high quality compost. The Proposal will also mean diverting it from landfill, which in turn increases the life of existing landfill cells, reduces greenhouse gas emissions and environmental, water and groundwater impacts from landfill leachate.

The Proposal will also provide opportunity for a future FOGO kerbside collection service for the local community thus servicing future generations. Recycling organics is economically important and unique in that it provides resources or inputs to a range of industries (e.g. nurseries, agriculture, landscaping businesses, Council, residents) without depleting natural resources while also reducing the need for artificial products.

The Proposal is consistent with the principles of intergenerational equity,

8.2.3 Conservation of Biological Diversity and Ecological Integrity

Ecologically Sustainable Development mandates that the conservation of biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes. Biodiversity refers to the variety of all life.

A comprehensive assessment of the existing flora and fauna on the Site has been undertaken in order to recognise and manage any potential impacts of the Proposal on local biodiversity.

The Site comprises a highly disturbed landscape impacted by current and historical agricultural activities and consist of mostly cleared land. The Proposal has been designed with an objective of minimising potential impacts on the surrounding environment. The Proposal will result in the removal of one hollow bearing tree and 11 ha of cleared land. Therefore, the Proposal is not expected to significantly impact threatened species, populations, or ecological communities listed under the BC Act or EPBC Act.

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Tamworth Organic Recycling Facility ORF

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Tamworth Organics Recycling Facility

Environmental Impact Statement

Addendum 1

Prepared for

Tamworth Regional Council

Client representative

Megan Mather

Date of this Addendum

5 December 2019

Statement of Authorship

Submission of Environmental Impact Statement (EIS)

Schedule 2, Part 6 and 7 of Environmental Planning and Assessment Regulation 2000

EIS prepared by:

Name:	Jessica Berry Principal Environmental Consultant
Qualifications:	BSc/BA Masters Environmental Management CEnvP (2019)
Company:	**pitt&sherry Pty Ltd**
Address:	Suite 902, Level 9, 1-5 Railway Street Chatswood NSW 2067

Development Application:

Proponent Name:	Tamworth Regional Council Responsible Person: Megan Mather
Proponent Address:	Ray Walsh House, 437 Peel St Tamworth NSW 2340
Land to be Developed:	Lot 61 DP 707563; 284 Gidley Appleby Road, Gidley NSW 2340 Tamworth Local Government Area
Development Description:	Resource Recovery Facility (Composting)

Declaration:

I declare that:

1. The statement has been prepared in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.
2. The statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates.
3. The information contained in this statement is neither false or misleading.

Name: **Jessica Berry**

Signature:

Date: 5 December 2019

Secretary's Environmental Assessment Requirements (SEARs)

Appendix A

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Industry Assessments
Contact: John Booth
Phone: (02) 8275 1281
Email: john.booth@planning.nsw.gov.au

Ms Megan Mather
Tamworth Regional Council
Ray Walsh House
437 Peel Street
TAMWORTH NSW 2340

EF19/17670
SEAR 1340

Dear Ms Mather

Composting Facility
284 Gidley Appleby Road, Gidley (Lot 61 DP 707563)
Planning Secretary's Environmental Assessment Requirements (SEAR) 1340

Thank you for your request for the Planning Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

In support of your application, you indicated that your proposal is both designated and integrated development under Part 4 of the *Environmental Planning and Assessment Act 1979* and requires an approval under the *Protection of the Environment Operations Act 1997*, the *Roads Act 1993*, the *Rural Fires Act 1997*, the *Water Management Act 2000*, the *Heritage Act 1977* and the *Fisheries Management Act 1994*. In preparing the SEARs, the Department has consulted with the Environment Protection Authority, the Office of Environment and Heritage, the Department of Primary Industries and the Roads and Maritime Services. A copy of their requirements is attached.

If any other integrated approvals are identified before the Development Application (DA) is lodged, you must undertake direct consultation with the relevant agencies, and address their requirements in the EIS.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Commonwealth Department of the Environment and Energy on (02) 6274 1111.

Should you have any further enquiries, please contact John Booth, Planning Services, at the Department on the details above.

Yours sincerely

C. Ritchie 30/5/19

Chris Ritchie
Director
Industry Assessments
as delegate of the Planning Secretary

Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*. Schedule 3 of the *Environmental Planning and Assessment Regulation 2000.*

Designated Development

SEAR Number	1340
Proposal	Construction and operation of a proposed Organics Recycling Facility (ORF) processing up to 35,000 tpa or organic waste material.
Location	284 Gidley Appleby Road, Gidley, Tamworth Regional Council LGA (Lot 61 DP 707563).
Applicant	Tamworth Regional Council
Date of Issue	29 May 2018
General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*
Key Issues	The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed: • **strategic context** – including: - a detailed justification for the proposal and suitability of the site for the development - a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies – a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out. • **waste management** – including: - details of the type, quantity and classification of waste to be received at the site - details of the resource outputs and any additional processes for residual waste - details of waste handling including, transport, identification, receipt, stockpiling and quality control – the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*. • **hazards and risk** – including: - the Environmental Impact Statement must include a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).

	• **air quality** – including: - a description of all potential sources of air and odour emissions - an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines - a description and appraisal of air quality impact mitigation and monitoring measures. • **noise and vibration** – including: - a description of all potential noise and vibration sources during construction and operation, including road traffic noise - a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines - a description and appraisal of noise and vibration mitigation and monitoring measures. • **soil and water** – including: - a description of local soils, topography, drainage and landscapes - details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the *Water Act 1912* and/or the *Water Management Act 2000* - an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment - details of sediment and erosion controls - a detailed site water balance - an assessment of potential impacts on the quality and quantity of surface and groundwater resources - details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts - a description and appraisal of impact mitigation and monitoring measures. • **traffic and transport** – including: - details of road transport routes and access to the site - road traffic predictions for the development during construction and operation - an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development. • **biodiversity** – including: - accurate predictions of any vegetation clearing on site or for any road upgrades - details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies - a detailed description of the measures to avoid, minimise, mitigate and offset biodiversity impacts. • **visual** – including an impact assessment at private receptors and public vantage points. • **heritage** – including Aboriginal and non-Aboriginal cultural heritage.
Environmental Planning Instruments and other policies	The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to: • State Environmental Planning Policy (Infrastructure) 2007 • State Environmental Planning Policy (Rural Lands) 2008 • State Environmental Planning Policy No 33–Hazardous and Offensive Development • State Environmental Planning Policy No 55–Remediation of Land • Tamworth Region Local Environmental Plan 2010 • relevant development control plans and section 94 plans.
Guidelines	During the preparation of the EIS you should consult the Department's Register of Development Assessment Guidelines which is available on the Department's website at planning.nsw.gov.au under Development Proposals/Register of Development Assessment Guidelines. Whilst not exhaustive, this Register contains

	some of the guidelines, policies, and plans that must be taken into account in the environmental assessment of the proposed development.
Consultation	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the: • Environment Protection Authority • Office of Environment and Heritage • Department of Primary Industries • Roads and Maritime Services • Natural Resources Access Regulator • Tamworth Regional Council • the surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultation carried out and issues raised must be included in the EIS.
Further consultation after 2 years	If you do not lodge an application under Section 4.12(8) of the *Environmental Planning and Assessment Act 1979* within 2 years of the issue date of these SEARs, you must consult with the Planning Secretary in relation to any further requirements for lodgement.

SEARs reference table

Appendix B

Aspect	*Secretary's Environmental Assessment Requirements*	*Reference in EIS*
General requirements		
	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*	Administration
Key Issues		
Strategic Context	strategic context — including: a) a detailed justification for the proposal and suitability of the site for the development b) a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies c) a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out.	Section 1.4 Section 1.8
Waste Management	waste management — including: a) details of the type, quantity and classification of waste to be received at the site b) details of the resource outputs and any additional processes for residual waste c) details of waste handling including, transport, identification, receipt, stockpiling and quality control d) the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21.	Section 76.10
Hazards and Risk	hazards and risk — including: a) the Environmental Impact Statement must include a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 — Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary	Section 6.14 Appendix L

Aspect	*Secretary's Environmental Assessment Requirements*	*Reference in EIS*
	Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).	
Air Quality	air quality — including: a) a description of all potential sources of air and odour emissions b) an air quality impact assessment in accordance with relevant Environment c) a description and appraisal of air quality impact mitigation and monitoring measures.	Section 6.1 Appendix M
Noise and Vibration	noise and vibration — including: a) a description of all potential noise and vibration sources during construction and operation, including road traffic noise b) a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines c) a description and appraisal of noise and vibration mitigation and monitoring measures	Section 6.2 Appendix F
Soil and Water	soil and water — including: a) a description of local soils, topography, drainage and landscapes b) details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000 c) an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment d) details of sediment and erosion controls e) a detailed site water balance f) an assessment of potential impacts on the quality and quantity of surface and groundwater resources g) details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts h) a description and appraisal of impact mitigation and monitoring measures.	Section 6.7 Section 6.8 Section 6.9 Section 6.10 Appendix N
Traffic and Transport	traffic and transport — including: a) details of road transport routes and access to the site b) road traffic predictions for the development during construction and operation c) an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.	Section 6.3 Appendix G

Aspect	*Secretary's Environmental Assessment Requirements*	*Reference in EIS*
Biodiversity	biodiversity — including: a) accurate predictions of any vegetation clearing on site or for any road upgrades b) details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies c) a detailed description of the measures to avoid, minimise, mitigate and offset biodiversity impacts.	Section 6.4 Appendix H
Visual	visual — including an impact assessment at private receptors and public vantage points.	Section 6.12
Heritage	heritage — including Aboriginal and non-Aboriginal cultural heritage.	Section 6.5 Section 6.6 Appendix I
Guidelines		
	During the preparation of the EIS you should consult the Department's Register of Development Assessment Guidelines which is available on the Department's website at planning.nsw.gov.au under Development Proposals/Register of Development Assessment Guidelines. Whilst not exhaustive, this Register contains some of the guidelines, policies, and plans that must be taken into account in the environmental assessment of the proposed development.	Administration
Consultation		
	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the: a) Environment Protection Authority b) Office of Environment and Heritage c) Department of Primary Industries d) Roads and Maritime Services e) Natural Resources Access Regulator f) Tamworth Regional Council g) the surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultation carried out and issues raised must be included in the EIS	Section 5 Appendix C
Further Consultation after 2 years		
	If you do not lodge an application under Section 4.12(8) of the Environmental Planning and Assessment Act 1979 within	Note

Aspect	*Secretary's Environmental Assessment Requirements*	*Reference in EIS*
	2 years of the issue date of these SEARS, you must consult with the Planning Secretary in relation to any further requirements for lodgement.	

Consultation

Appendix C

pitt&sherry

Tamworth Organic Recycling Facility

Frequently Asked Questions

Organic Recycling Facility

Why does the Tamworth Region need an Organic Recycling Facility?

- In June 2017, Council adopted the Integrated Waste Management and Resource Recovery Strategy (the Strategy) that identifies Council's ambitions for sustainable waste management incorporating increased resource recovery and recycling.
- Council's Strategy aligns with both:
  - State Government - Environment Protection Authority's *Waste Avoidance* and *Resource Recovery* Strategy (WARR Strategy); and
  - Regional waste policies and strategic themes - Northern Inland Regional Waste Group (NIRW Waste Strategy).
- In order for Council to improve on the region's waste and resource recovery initiatives and diversion targets, the development of a designated Organic Recycling Facility is necessary.

An Organic Recycling Facility can reduce up to 15,000 tonnes per annum of organic material currently being landfilled.

What is an Organic Recycling Facility?

- An Organic Recycling Facility is a purpose built facility, designed with innovative processing technology to accept and treat organic waste streams to recover valuable products from being landfilled and processed to produce a high end product suitable for landscaping or agriculture purposes.

What is a Tunnel Composting System?

- The process of Tunnel Composting involves the treatment of batched organic products in fully enclosed long ventilated composting tunnels for up to four weeks. Each tunnel operates independently from other tunnels, which allows the Operator more control over the desired processing duration and resultant end product;
- Ventilation within each tunnel is achieved by the incorporation of fans within the structure; and
- To maintain hydration of the material during processing, a water spray system is installed to regulate heat and maintain optimal moisture content of the compost output material.

What types of materials are going to be processed?

- The facility will process a variety of organic materials including Food and Garden Organics and Category 3 Organics, which include meat, fish and fatty foods, fatty and oily sludge's and commercial organics of animal and vegetable origin.

What is the expected processing capacity of the facility?

- The facility will be constructed to initially process up to 35,000tpa; and
- There is consideration for expansion of the facility's processing capacity to 50,000tpa in the future as the growth of Tamworth region and associated industry expands.

Where is the Organic Recycling Facility proposed to be located?

- The proposed location for the development of the Organic Recycling Facility is 284 Gidley Appleby Road, Gidley. The operational footprint of the Organic Recycling Facility is expected to be 5ha on a 117ha property.

How long does the composting process take?

- The entire process is reliant on the quality of the desired end product (i.e. high grade mulch vs soil conditioner) and market demand. However, the process can be broken down into two primary stages:
  - Stage 1 - Pasteurisation: 28 day total resident time within tunnels (2 x 14 day cycles); and
  - Stage 2 - Maturation: minimum 8 weeks in open windrow.

What is the end product suitable for?

- The end products that will be produced through the Organic Recycling Facility will be suitable for landscaping and agricultural uses i.e. high grade mulch, compost and soil conditioners.

Will Council operate the facility?

- No, it is proposed that the Organic Recycling Facility will be operated on behalf of Council by a specialist Operator, with approximately 6 on-site staff;
- The facility will be for commercial customers only; and
- All domestic customers will continue to have access to Forest Road Landfill for drop-off of their greenwaste organic material.

Will the facility be licenced with the NSW Environment Protection Authority?

- Yes, Council will submit an application to obtain an Environment Protection Licence (EPL) with the NSW Environment Protection Authority (EPA);
- An EPL is required by law under the Protection of the Environment Operations Act 1997 for certain activities of industrial scale. Licence conditions relate to pollution prevention and monitoring, cleaner production through recycling and reuse and the implementation of best practice methods;
- Council would be listed as the Licence Holder of the EPL, not the specialist Operator; and
- The EPA has powers to compel Licence Holders to take action as required should any environmental issues or concerns be raised regarding the facility's operations.

What are the proposed operational hours:

- During Construction:
  - Monday - Friday: 7am to 6pm; and
  - Saturday (only if required): 8am to 1pm.
- Once Commissioned (dependent on Operator): Monday to Sunday - 8am to 4:45pm.

What are the benefits of an Organic Recycling Facility utilising a Tunnel Composing System?

- Front end:
  - Increases landfill capacity and extends lifespan of landfills by the diversion of organic waste streams;
  - Improved control over: aeration, temperature and moisture; and
  - Reduced operational demand on staff, equipment and costs i.e. limited need for turning material and costs of electricity and fuel.
- Back end:
  - Reduces production of greenhouse gasses within landfills by the diversion of organic waste streams; and
  - Recovers and recycles organic materials into a valuable product suitable for landscaping and agricultural application.

How much is the Project expected to cost?

- The overall expected cost of the Project is estimated at $15.2 million with $3 million secured in grant funding under Round 6 of the Organics Infrastructure (Large and Small) Program. The balance of the funding will be provided by Council.

The Project is supported by the Environmental Trust as part of the NSW EPA's Waste Less, Recycle More initiative, funded from the waste levy.

Development Application Process

Is this Project subject to a Development Application?

- Yes, this Project is subject to a Development Application. The Development Application is expected to be submitted in August 2019, which will include a full Environmental Impact Statement and Concept Design placed on Public Exhibition.

What is an Environmental Impact Statement?

- An Environmental Impact Statement is a document specifically prepared to describe the effects for proposed activities on the environment i.e. impacts to threatened or endangered species (flora and fauna), air and water quality, historical and cultural sites, social and economic impacts, traffic etc.

Key topics that will be addressed in the Environmental Impact Statement include:

- Air Quality and Odour;
- Noise and Vibration;
- Traffic and Transport;
- Biodiversity;
- Aboriginal Cultural Heritage and Non-Indigenous Heritage;
- Soils and Geology;
- Surface Water Hydrology, Stormwater and Wastewater Management and Groundwater;
- Waste Management;
- Visual Amenity; and
- Cumulative Impacts.

Key Facility Design considerations for mitigation measures include:

- Purchase of a large property;
- Sealed access road from Gidley Appleby Road to operational area on the property;
- Location of operational area towards centre of property;
- Investment in state of the art composting technology: a fully enclosed tunnel composting system;
- Fully enclosed receival shed;
- Biofilter for treatment of extracted air prior to discharge to the surrounding environment;
- One way Traffic flows on property within operational area;
- Re-use of leachate and stormwater through processing; and
- Revegetation activities to: improve nature corridors, aid soil and water conservation, enrich native surrounding plant communities and screen operations.

Is Tamworth Regional Council the determining Authority on the Development Application?

- No, Tamworth Regional Council is not the determining Authority on this Project; and
- This Project is considered to be a Designated Development, and as such, the Joint Regional Planning Panel, which operates across New South Wales to provide independent, merit-based decision making on regionally significant developments will determine the outcome of the Development Application.

Can anyone view the Development Application?

- Yes, once the Development Application is lodged, it will be placed on Public Exhibition. Anyone can view the Application and submit comments or express views regarding the Application; and
- Council will advise land owners of properties adjacent to the proposed site when the Development Application is on public display. The Application will also be advertised in the local newspaper.

How long are the documents displayed on Public Exhibition for?

- The documents must be displayed on Public Exhibition for at least 28 days.

Site Location and Alternative Sites

How did Council identify 284 Gidley Appleby Road as being the proposed site?

- Council undertook a detailed desktop Geographic Information System (GIS) investigation, High Level Environmental Review Assessment, Odour and Wildlife Risk Assessment and Site Inspection before determining 284 Gidley Appleby Road was the most suitable site, within 20km of Forest Road Landfill.

Why can't the facility be established at Forest Road Landfill?

- There is no suitable space available on-site at Forest Road Landfill for the establishment of an Organic Recycling Facility;
- Forest Road Landfill is located in very close proximity to high density residential developments, with insufficient space to establish the required buffer zones to mitigate any potential environmental impacts (i.e. odour, noise, traffic etc.); and
- Forest Road Landfill already receives a high level of traffic flow on a day to day basis with a mix of domestic and commercial customers. Establishing a commercial facility on the same land parcel, would increase the risks associated with traffic movements on site.

Why can't the facility be established in the Industrial area?

- Advice from Wildlife Risk Assessment Consultants has confirmed that Organic Recycling Facilities must be located outside 3km or at least 8km from any airstrip or airport to avoid the potential increased risk from bird strike on aircraft; and
- The Glen Artney Industrial area of Tamworth is within 3km of the airport.

Additional Information and Queries

Will this site become the new future Landfill site once the space at Forest Road Landfill is consumed?

- No, there is no proposal for 284 Gidley Appleby Road to become the next identified Landfill site for the Tamworth Region.

Classification of Land

- Upon any purchase of land by Council, there is a legislative requirement, under the Local Government Act 1993, to classify the use of the land as either 'Operational' or 'Community' under the provisions of that Act. This is not a reclassification, but an initial classification process.

Where can I find out more information?

- http://www.tamworth.nsw.gov.au/Waste/Proposed-Organic-Recycling-Facility
- https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility
- Contacting Megan Mather, Senior Environmental Officer, Tamworth Regional Council (02) 6767 5049.

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Dear

PROPOSED ORGANICS RECYCLING FACILITY

Ref: nc/SF7667/DC

You may be aware Tamworth Regional Council has been working towards establishing an Organics Recycling Facility in Tamworth for a number of years and in April this year it was decided to purchase a 117-hectare property about 20 kilometres from the CBD.

As a Gidley resident or property owner, I am writing to advise you the site is at 284 Gidley Appleby Road, Gidley and to tell you about the proposed facility and the process ahead before the development is considered for approval by the Joint Regional Planning Panel.

The purchase of the property went ahead after a detailed environmental assessment of the property found it to be suitable for the proposed facility which is crucial to better manage our community's waste into the future.

The project is expected to cost $15.2 million with $3 million in NSW Government funding already secured.

As a nearby resident or property owner, this letter is the start of an ongoing conversation with you as the process to establish the facility moves forward.

The Tamworth Organics Recycling Facility will provide our community with its first food and organics waste recycling operation. It will mean we can divert food and organic waste from Tamworth's Forest Road Landfill, helping to extend the life of that facility while achieving a more sustainable waste solution.

The facility will be designed to receive up to 35,000 tonnes of food and organic waste each year. It will make use of enclosed tunnel composting, an innovative composting process which will provide a greater control on environmental aspects such as odour.

Now with the purchase of the land complete, the next phase of the project will be to finalise and lodge a development application in August which will then be determined by the Joint Regional Planning Panel.

We will write to you again at that time to explain to you how you can access the documents on public exhibition as part of the development application and how you can provide us with feedback

about the proposal. We will also invite you to find out more at a community information session to be held sometime in July at a venue yet to be finalised.

In the meantime, residents and businesses who wish to obtain further information about the proposal or provide feedback are invited to contact our Waste Management team.

Please contact Megan Mather, Senior Environmental Officer on 02 6767 5049 or alternatively written submissions can be made to trc@tamworth.nsw.gov.au or PO Box 555, Tamworth, NSW 2340.

This project is supported by the Environmental Trust as part of the NSW Environment Protection Authority's Waste Less, Recycle More initiative, funded from the Waste Levy.

Yours faithfully

Dan Coe
Manager Water and Water Operations
Tamworth Regional Council
Contact: (02) 6767 5811 or trc@tamworth.nsw.gov.au

28 May 2019

To the Resident

Dear Resident

Notification of Community Information Session for Proposed Organic Recycling Facility, 284 Gidley Appleby Road, Gidley.

Ref: mm/DC/SF7667

Tamworth Regional Council (Council) recently wrote to property owners advising of Council's intention to lodge a Development Application for the proposed Tamworth Organic Recycling Facility, located at 284 Gidley Appleby Road.

The proposed Organic Recycling Facility will allow our community to benefit from:

- its first designated Food and Garden Organic Kerbside Collection;
- saving valuable landfill space by the removal of Organics from landfill; and
- the ability to include the processing of Category 3 Organics to provide an end product, which may include a range of high-grade mulch, compost and soil conditioners for use by local residents and agricultural uses.

As part of the Preliminary Planning Stage, Council wishes to engage and invite neighbouring property owners to obtain more information and provide feedback on the proposal via organising a suitable time and place for a one on one session and / or attend the Community Consultation Meeting.

The Community Consultation Meeting will be held at the following venue and time:

Tamworth Community Centre - Britten Room

3A Darling St, Tamworth

18 July 2019 at 5.30pm

Further information can be found at the following websites:

- http://www.tamworth.nsw.gov.au/Waste/Proposed-Organic-Recycling-Facility/Proposed-Organic-Recycling-Facility
- https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

Council wishes to confirm that this Project is currently at the Preliminary Planning Stage, in which, an Environmental Impact Statement and Concept Design are currently being prepared so that a Development Application may be lodged in August 2019. Following the lodgement of the Development Application, further information on the Environmental Impact Statement and Concept Design will be placed on public exhibition, where the community may submit a written response about the proposal.

This Project is considered to be a State Significant Development, and as such, the Development Application, should it be submitted, will not be determined by Tamworth Regional Council. The Joint Regional Planning Panel (JRPP), which operates across New South Wales to provide

independent, merit-based decision making on regionally significant developments will determine any Development Application on this matter.

Please feel free to contact Megan Mather, Senior Environmental Officer on (02) 6767 5049 if you wish to discuss any Project details or arrange a suitable one on one session.

Or alternatively written submissions can be made to trc@tamworth.nsw.gov.au or PO Box 555, Tamworth, NSW 2340.

This project is supported by the Environmental Trust as part of the NSW Environment Protection Authority's Waste Less, Recycle More initiative, funded from the Waste Levy.

Yours Sincerely,

Dan Coe
Manager of Water & Waste Operations

Contact: Megan (02) 6767 5049

6 June 2019

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

Dear Sir/Madam,

ORGANIC RECYCLING FACILITY PROPOSAL – COMMUNITY INFORMATION SESSION - 18 JULY 2019

Ref: mm/BL/SF7667

Thank you for attending the Community Information Session last Thursday regarding Tamworth Regional Council's (Council) proposed Organics Recycling Facility, located at 284 Gidley Appleby Road, Gidley.

I would like to acknowledge and thank you for your interest and taking the time to give us feedback about the proposed Facility.

Your concerns raised at the meeting have been noted and provided to our Consultant, pitt&sherry, to ensure they are addressed in the Environmental Impact Statement to be included in our Development Application. Those concerns include:

- Water Management;
- Traffic Impacts and Access;
- Biosecurity; and
- Air Quality and Odour.

To allow a full review of the feedback provided on the night and conduct further assessments, Council will delay lodging the Development Application until September 2019. All documents, which form part of the Application will be available publicly online and in Council's offices once it has been submitted.

One of the questions asked at the Information Session was for a list of all sites within NSW, which use Tunnel Composting. Council has consulted with the NSW Environmental Trust (the Trust) to determine a list of locations within NSW, which operate an Organic Recycling Facility that utilise Tunnel Composting Technology, these include:

- Dubbo;
- Grafton;
- Orange;
- Lake Macquarie;
- Shellharbour;

- Kemblah Grange; and
- Kemps Creek.

Further information, including a copy of the Frequently Asked Questions, proposal overview, which pitt&sherry presented on the night and the list of questions asked at the information session can be found at the MyTRC Online Community portal:

https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

Regular Project updates will be provided through this portal including notification of the Development Application lodgment.

Please feel free to contact Megan Mather, Senior Environmental Officer on (02) 6767 5049 if you wish to discuss the proposal further.

Or alternatively, you may email trc@tamworth.nsw.gov.au or post a letter to: The General Manager, PO Box 555, Tamworth, NSW 2340.

Thank you again for your attendance and feedback about the proposed project.

Yours Sincerely,

Bruce Logan
Director – Water & Waste

Contact Megan: (02) 6767 5049

24 July 2019

REGIONAL COUNCIL
Tamworth

A region of opportunity and prosperity,
a place to call home

Media Opportunity

EMBARGO 11.30am Wednesday 29 May, 2019

Tamworth Organics Recycling Facility Update

Tamworth Regional Council will announce the site it has bought for the proposed $15.2 million Tamworth Organics Recycling Facility.

What: Announcement of proposed site

Date: Wednesday 28 May, 2019

Time: 11.30am

Venue: 284 Gidley Appleby Road, Gidley – about 20kms from Tamworth CBD

Media Opportunities

Mayor Col Murray will be available on site along with Council's Manager Operations Water and Waste, Dan Coe.

Please note: Council is permitting media access to the property at the time of the media opportunity only. Access is not permitted without prior approval from Council due to privacy concerns for its tenants on the property.

<ENDS>

MEDIA CONTACT: [redacted]

Media Release

Wednesday 29 May, 2019

Gidley site for proposed organics recycling facility

Tamworth Regional Council today announced it has bought a 117-hectare property at Gidley for its proposed $15.2 million Tamworth Organics Facility.

The purchase of the property went ahead after a detailed environmental assessment of the property - at 284 Gidley Appleby Road - found it to be suitable for the proposed facility.

The property's location on a route approved for use by B-double freight vehicles was also a key factor in selection of the site.

Tamworth Region Council Mayor Col Murray said the Organics Recycling Facility will provide the Region with its first food and organics waste recycling operation.

"It will be a major step forward to better manage our community's waste into the future," he said. "It will mean we can divert food and organic waste from Tamworth's Forest Road Landfill, helping to extend the life of that facility while achieving a more sustainable waste solution."

"Now with the purchase of the land complete, the next phase of the project will be to finalise and lodge a development application in August which will then later be determined by the Joint Regional Planning Panel."

The Tamworth Organics Recycling Facility is expected to cost $15.2 million. A total of $3 million in NSW Government funding already secured through the Environmental Trust as part of the NSW Environment Protection Authority's Waste Less, Recycle More initiative, funded from the Waste Levy.

The facility will be designed to receive up to 35,000 tonnes of food and organic waste each year. It will make use of enclosed tunnel composting, an innovative composting process which will provide a greater control on environmental aspects such as odour.

Cr Murray said Council has this week written to property owners and residents adjacent to the Gidley property to let them know about the proposed use of the site. Their letter also explains how they can find out more about the facility once the development application including a detailed Environmental Impact Statement is lodged and on public exhibition.

<ENDS>

MEDIA CONTACT: [redacted]

SF7667

NEWSPAPER INSTRUCTIONS
TAMWORTH REGIONAL COUNCIL

PAPER	TO APPEAR (DATE)	JOB NUMBER	AUTHORISED BY	SEND PROOF TO
NORTHERN DAILY LEADER	6 JULY AND 13 JULY 2019	[redacted]	DAN COE	MEGAN MATHER

NOTIFCATION OF COMMUNITY INFORMATION SESSION FOR THE PROPOSED TAMWORTH ORGANIC RECYCLING FACILITY

Tamworth Regional Council proposes the development of the Tamworth Organic Recycling Facility at 284 Gidley Appleby Road, Gidley, NSW, 2340 (Lot 61, DP 707563). The proposed Organic Recycling Facility will allow the Tamworth Community to benefit from its first designated Food and Garden Organic Kerbside Collection saving valuable landfill space by the diversion of organic waste streams from landfill. The facility will also provide organic end products such as mulch, compost and soil conditioners for use by local residents and agricultural purposes.

Tamworth Regional Council would like to invite interested Community members and businesses along to attend the Community Information Session, to be held Thursday 18 July 2019 at the Tamworth Community Centre - Britten Room, starting at 5:30pm.

For more information on the proposal, please feel free to contact Megan Mather - Senior Environmental Officer on (02) 6767 5049. Or written submissions can be made to trc@tamworth.nsw.gov.au or PO Box 555, Tamworth, NSW, 2340.

Proposed Organic Recycling Facility

Community Information Session

Tamworth Community Centre

Thursday, 18 July 2019

EXECUTIVE SUMMARY

Currently, Tamworth Regional Council's processing and composting of organic material is restricted to green waste only at the Forest Road Waste Management Facility. The Composting Facility is licensed with the Environment Protection Authority and processes approximately 15,000 tpa of green waste to produce a high-grade mulch product. The current operational footprint of the Composting Facility has reached maximum processing and storage capacity and additional organic waste stream materials, such as food organics and commercial products are currently being landfilled. It is estimated that these additional organic waste streams could be in the order of up to 10,000tpa.

This Project aims to divert organic materials from being landfilled, process these products at a new purpose-built facility, utilising Tunnel Composting System to produce an end product, which may include a range of high-grade mulch, compost and soil conditioners for use by local residents, businesses and for commercial and industrial uses.

This facility, once commissioned will provide the Tamworth region with the first Organic Recycling Facility, suitable to process up to 35,000tpa of a range of organic materials, including: Food and Garden organics and Category 3 organics. Category 3 organics incorporate meat, fish and fatty foods, fatty and oily sludge's and organics of animal and vegetable origin. There is consideration for expansion of the facility's processing capacity to 50,000tpa in the future as the growth of Tamworth region and associated industry expands.

ENGAGEMENT OBJECTIVES

To understand the concerns of the community.

PARTICIPANTS

Local residents and community members – approx. 50 attendees

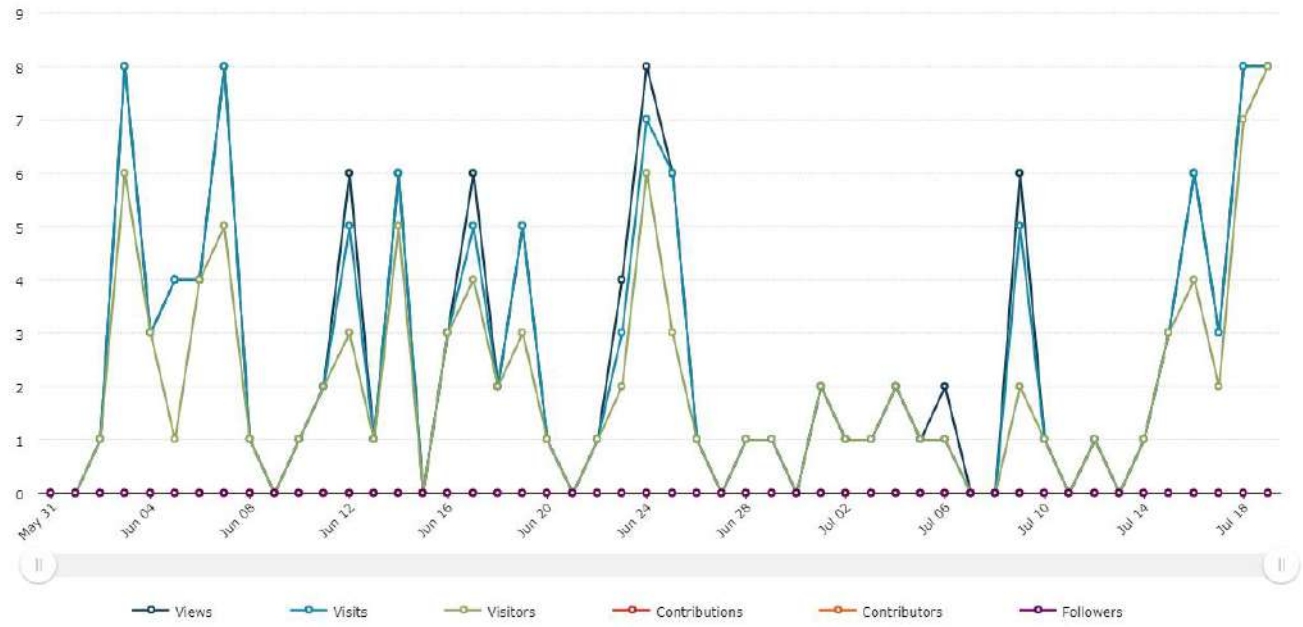
POINT OF INFORMATION

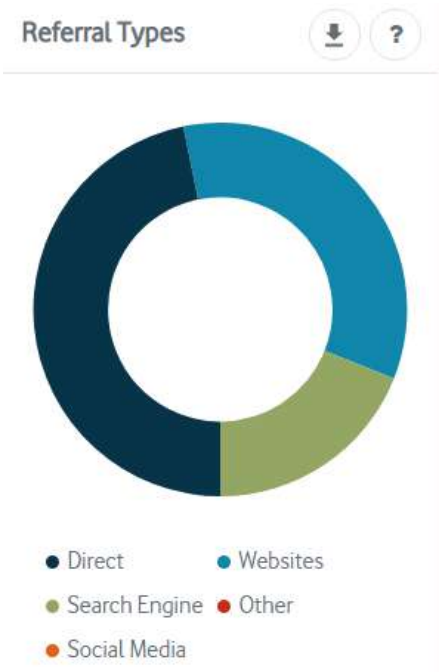
https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

RESULTS OF ENGAGEMENT

Information is available through the MYTRC Online Engagement portal at the following link:
https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

The following report shows the reach via the portal:





RESULTS OF PUBLIC INFORMATION SESSION

The following questions were asked:

1. Can Council provide a list of ALL Organic Recycling Facilities currently operating in NSW? Bruce Logan (TRC) replied yes, we can organise that.
2. Can Council provide a list of Organic Recycling Facilities running that will have the same level of abattoir waste received that the Tamworth facility will? TRC said that we can try to obtain this information.
3. Will the piles drying out on maturation pads cause odour and contamination especially when it is being turned? Bruce Logan explained the Facility will require a license, which will be administered by the NSW Environment Protection Authority (EPA). If the Facility is constructed you would submit your complaints to the EPA, either local office in Armidale or elsewhere.
4. Will the piles seep contamination into the ground water supply? [redacted] explained that it is part of the construction of the pads to prevent contamination or seepage into the ground water supply and that the Environmental Impact Statement (EIS) process will address these concerns.
5. Being so close to the Peel River, will there be potential for contamination to the water system, killing fish & wildlife? [redacted] explained that there will be a leachate dam designed to capture any contaminated waters in the event of a 1 in 100 year flood. In addition, there will also be runoff stormwater dams and tanks to reduce any potential of an overflow or flows of any waters off-site.
6. Can current bore water that neighboring property owners / residents are drinking be tested prior to any construction activities and then again after the facility is operational to see if there are any changes or contamination? Bruce Logan said yes he doesn't see an issue with this.
7. In regards to bio security is the time in the tunnels adequate?
   The resident time of batched organic materials in the tunnels is 28 days, which is double the EPA's recommended time normally. Council view the additional 14 days to be sufficient to address concerns related to bio security and odour.
8. How much water will the facility use each day? [redacted] said the EIS will produce these figures. However, the design of the facility will incorporate a high focus on reuse of leachate in the tunnels, followed by stormwater or bore water on the pad piles.
9. Have all the Aboriginal sites been identified on the property? There was a concerned Community member, saying that his mob had not been consulted on this proposal? [redacted] said the EIS will address any Aboriginal sites on the land and will touch base with the Community member following the conclusion of the meeting. Bruce Logan said the Development Application (DA) hasn't even been lodged as yet.

10. There will be a considerable increase in traffic flow including a large number of B-doubles, the road is too narrow and will be dangerous for school buses and children on the road before and after school. Jessica Berry explained a Traffic Assessment and counter has been performed. Bruce Logan said any road that needs improvement due to the facility will be included as a condition of development consent. This will be included in the EIS.
11. What is the extent or buffer required for biosecurity with the poultry farm being so close? This will be outlined in more detail in the EIS.
    Can the proposed entrance be looked at; it is 200 meters from a resident's house causing dust, odour and noise to the home. Could it be placed further north closer to the Poultry Farm entrance? The resident had been told previously that this wasn't an option due to the contamination to the chooks but she asked why it's ok to contaminate humans but not chooks? Bruce Logan said Council will look at the possibility to relocate the entrance to the facility so that potential negative impacts will be reduced to the resident's homes.
12. A resident residing opposite the proposed site made an offer for the Councillors to stand out the front of their home to view the site and proximity of the proposed entrance. Bruce Logan said that he would extend the offer to the Councillors following the submission of the Development Application.
13. Is there a more suitable site at Duri or anywhere else in the Tamworth region? Bruce Logan said Council has done an intensive search but this is still the most preferred site.
14. In the event of strong winds will the outside piles have dust or particles blown through the air to residents properties? Jessica Berry explained the produce will be moist so shouldn't carry in the wind. This will come down to EPA requirements and Facility operation.
15. What is the development called? Where does it fit under the current RU1 zoning? Megan Mather (TRC) said this is classified as a Designated Development and it is called a Resource Recovery Facility, the site is zoned RU1, which means the Facility is permitted only with consent. The Joint Region Panel are the consenting authority on this Project, not Council.
16. What compensation can be expected if the odour does affect residents? Bruce Logan replied Council would need to comply with conditions set by the EPA (Regulatory Authority) in the Development Consent if we are not complying then a complaint could be made to the local Armidale EPA. The EPA have lawful powers, including issuing of Fines to ensure that Council and the Facility's Operator are compliant to consent conditions.
17. How was the preliminary odour level testing conducted? What were the results? Jessica Berry explained that model testing was done. Models and maps will be in the detailed EIS.
18. What is the compliant odour level at this site to neighboring properties? EIS will detail this information.

19. What will happen to the land if the Organic Recycling Facility doesn't go ahead? Bruce Logan explained that the Councillor's would decide what to do with the land if the Organic Recycling Facility doesn't go ahead.
20. Can JRPP attend a Community Information Session? Bruce Logan said no he doesn't believe they will come to a Community Information Session, however, the public can attend the JRPP meeting where the decision is made, this is public meeting.
21. Have the EPA and JRPP been to the proposed site? Delegates from the Armidale EPA have been to the site, and they along with the JRPP members will go to site before making a decision on the Project.
22. Why are the maturation pads not inside to contain odour? [redacted] said it is an operational reason the pads are outside, she doesn't know of any facilities that have the pads inside and believes it would be harder to operate the Facility.
23. What changes will happen to curbside collection? There will be Organic Waste Collection to residents who currently have a Greenwaste Kerbside Collection. It is Council's intension to combine Food and Garden Organics (FOGO) to divert Food from being landfilled.
24. How will bones be broken down? Matt Hollis (TRC) explained that all materials will be shredded to approximately 40-50mm and batched together in the receival hall prior to being loaded into the tunnels. This material then sits within the tunnels, which is a controlled, moist and aerated environment at about 60-70 degrees for 28 days, which will not produce dust.
25. Have the Councilors been to the proposed site? Bruce Logan said he doesn't believe so.
26. Will attendees be emailed a copy of the presentation and F&Qs? Bruce Logan confirmed yes, residents that registered their email address and contact details will be contacted with information presented on the night.
27. Will attendees be emailed a copy of the EIS and the detailed design plan once available? No, residents will not be emailed a copy of the EIS and detailed design plan. However, residents will be notified when the documents are available during the exhibition period and residents will be able to download and view the documents and are welcome to make any submissions on the Project during this time.
28. Did council approach the property owner to sell or was the property on the market & did council pay double the market value with rate-payers money? Bruce Logan said Council approached the property owner and purchased the property.

Organic Recycling Facility - On-site Attendance Register 19 June 2019 4:30-5:45pm

Date	Name	Phone Number	Additional Information
19 June 2019	[redacted]		

Notes: 14 Residents in total attended site meeting, 12 Residents left contact details above.

- [redacted]

Primary issues raised related to:

- water use (dams, bore, tanks, reuse), water containment on-site, reducing water flows off-site (impacts filling of neighbours dams / irrigation of their land), reducing their access for groundwater use if utilising same aquifer, leachate generation and pollution to groundwater sources, which residents currently use for domestic:
  - Mention of EPL - requirements to contain all water on-site and have installation of GW monitoring wells to ensure leachate is not percolating into aquifer - residents stance still that leachate will cause pollution to their water sources and water will run-off site regardless of measures;
- odour generation on-site and via trucks transporting material - concern that regardless of mitigation measures, it will still smell;
- dust generation - during construction, will access road on-site be fully sealed prior to construction? After construction due to activities and traffic movements.
- traffic access on-site - can this be moved closer to ProTen's boundary?, traffic movements in / out of site and on roads, number of trucks increasing using roads, which already have large issues with large trucks navigating i.e. Gidley Siding Road via Wallamore and onto Gidley Appleby Road, Manilla Road onto Appleby Lane and Appleby Lane onto Gidley Appleby Road;
- hours of operation - concern that residents will not have a 'break' if operated Monday - Sunday, can hours be amended or days of operation be amended?
- biosecurity impacts to their farm (attraction of vermin to site) / around ProTen - how do we intend to control? How can Council 'get-away' with putting dams on-site that allow collection of dirty-water (or breeding of bacteria) when they can't do it on their farm?:
  - Confirmed that design will include wheel wash to mitigate migration of material off-site;
  - Security fencing to be installed around the operational area / facility.
- devaluation to properties because of: increase in traffic movements, noise, odour (air quality), visual and overall proposal of 'Organic Recycling Facility' within the area;
- concerns that this will turn into Tamworth's next landfill site - this is not the intention and most likely approval would not be granted for a landfill at this site for a large variety of reasons;
- zoning of land - confusion of "Council classifying land as Operational" and "Council re-zoning land":
  - Council have purchased the property and as such, legislation requires Council to classify land either as Operational or Community - separate issue;
  - Council is not re-zoning the land - the land is zoned as RU1 - Primary Production and as such, the development is 'permitted with consent'.
  - Project is best defined as "Resource Recovery Facility", which is permitted in RU1 with consent as it includes: 'Landscaping material supplies' and 'any other development not specified in item 2 or 4' - Tamworth LEP 2010.
- Confirmation of Development Application Process - DA submitted in August 2019, residents will have an opportunity to view full EIS / Concept Design and make their submissions / comments on the proposal, aim to make submissions within 28 days. Following this, proposal submitted and determined by the JRPP (independent panel NOT Council). Timeframes can vary depending on JRPP meetings (last time took up to 6 months for first meeting).
- Issue raised that the State Government has provided funding, so regardless of the JRPP they support and want to see this type of development achieved.

- Confirmation of Community Information Session to be held 18 July 2019 - will be similar where any interested residents can participate to express concerns or find out more information on the proposal.

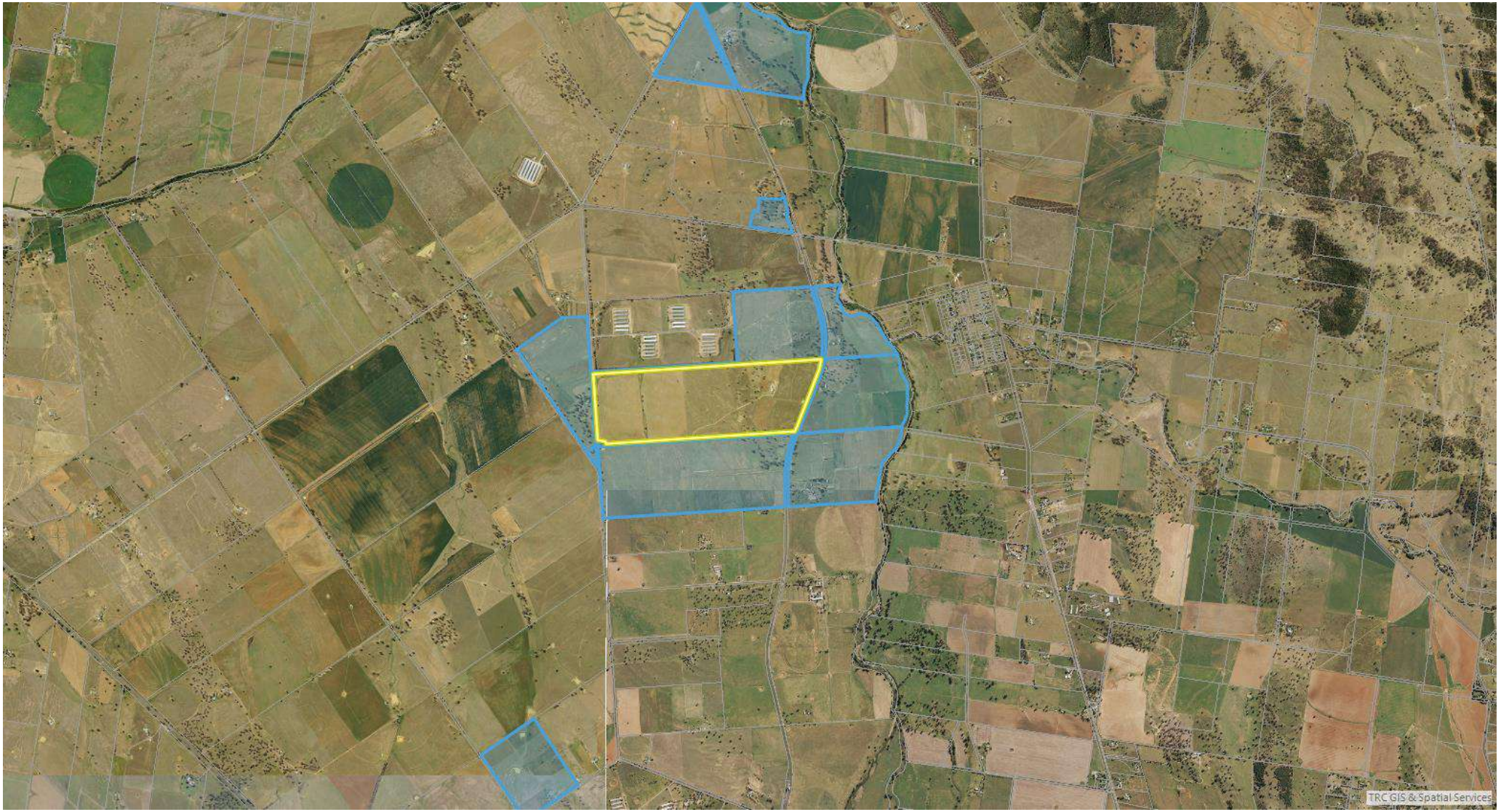


Figure 1: Identification of Interested Residents Properties and Proposed Organic Recycling Facility Site.

Planning, Industry & Environment

[redacted]
Newcastle Office, Level 1
81 Hunter Street
Newcastle NSW 2300
[redacted]

Our ref: DOC19/591110
Your ref:

11 July 2019

Dear [redacted]

Subject: Composting Facility – 284 Gidley Appleby Road, Gidley SEAR 1340 Flood Assessment Requirements

Thank you for your email dated 4 July 2019 requesting comment from the Biodiversity and Conservation Division ((BCD) formally Office of Environment and Heritage) of the Department of Planning, Industry and Environment (the Department) regarding the flooding requirement component of the issued SEARs 1340 for the Composting Facility at Gidley.

The BCD note in your email the assessment completed to date, advising confirmation that the proposal resides outside of Councils mapped LEP flood planning area and outside of the 1% AEP flood event. The BCD recommend that this information is included in the Environmental Impact Statement (EIS) submitted for the project to address the general assessment requirements in the SEARs. The BCD concurs with the inclusion of a qualitative assessment of potential impacts and management actions relating to the floodplain and stormwater management in the finalised EIS.

As such, the BCD advise that the SEARs do not need to be revised as long as all decisions are fully justified and documented in the EIS. Any requests to change SEARs must be made to the consent authority, in this case, the Planning and Assessments Group of the Department.

If you have any queries, please contact [redacted]

Yours sincerely,

[redacted]

Senior Team Leader Planning – North West

Biodiversity and Conservation Division

Preliminary Engineering Design

Appendix D

pitt&sherry

Tamworth
Tunnel Composting Facility

DRAFT

Conceptual Design

Prepared for

Tamworth Regional Council

August, 2018

Table of Content

1 PROPOSED NEW COMPOSTING FACILITY

1.1 Green Field Site

The following conceptual design has been prepared for the facility to be established on a green field site. The attached layout shows the designated footprint for the proposed composting facility including a preliminary configuration and approximate area requirements for the operation for the purpose of an application for NSW EPA funding under the organics infrastructure grant scheme.

The layout is based on a two staged tunnel composting process involving 28 (2 x 14) days residence time to guarantee pasteurisation (after 14 days) and produce a composted product after 28 days (all as per AS 4454-2012), which is free of offensive odour and does not require further turning & moistening during final maturation.

The maturation area allows for further 6 weeks maturation / storage during which period products can be further refined to meet the requirements for marketing & sale.

1.2 Plant Capacity & Feedstock Materials

Tamworth Regional Council (TRC) is seeking funding for a facility which is initially capable of receiving and processing 35,000 tpa with the option of modular extension up to potentially 50,000 tpa subject to demand and population growth.

The facility shall in any event cater for 100% of the initial quantities and be able to accommodate for seasonal variations in quantities and characteristics. The modular concept of the tunnel composting system allows modular extension of the plant in the future.

The following design caters for the main building to cater for the ultimate capacity of 50,000 tpa and the tunnels including biofilter to process 35,000 tpa with the ability to be modular extended to reach the ultimate capacity as needed.

Final size and number of tunnel modules will be determined during the design stage however for the purpose of this application, the following design configuration has been adopted:

- Number of Tunnel Modules: 7 (35,000 tpa); respectively 10 (50,000 tpa)
- Module Size (net): 8.25m width, 25.75m length and 4.75m height

The biofilter capacity would be increased to meet the ultimate capacity requirements by increasing the biofilter media height accordingly (from 1m to about 1.5m).

The feedstock material will comprise kerbside collected organics (FOGO, GO), self hauled green wastes and various organic solid and liquid wastes from the agricultural sector and associated industries.

For the purpose of this concept design we have adopted the following composition and feedstock characteristic:

INPUT		Quantities	Moisture		Solids	Organics (VS)		Bulk Density
		t/yr	%	t/yr	t/yr	%	t/yr	t/m3
FOGO		12,750	45%	5,738	7,013	70%	4,909	0.45
Green Waste		9,000	40%	3,600	5,400	70%	3,780	0.35
Others		13,250	80%	10,600	2,650	70%	1,855	0.80
Total		**35,000**	**57%**	**19,938**	**15,063**	**70%**	**10,544**	**0.50**

Table 1

The Category **Others** include the following feedstock materials and assumed moisture content:

Others		
Category	TOTAL (tpa)	Moisture
Paunch	3,800	97.00%
Liquid waste	2,250	99.00%
Offal	3,450	75.00%
Timber	1,600	30.00%
DAF Sludge	2,400	80.00%
Others Total	**13,500**	

Table 2

Further quantities of manure, saw dust and other organic products which may be required for the composting process to enhance product value and/or meet market requirements.

1.3 Process Description

The composting plant incorporates a tunnel composting process, which provides a high level of monitoring & control of critical process parameters. This minimises the environmental impact of the operation and facilitates the production of consistent and high quality organic products for beneficial local applications.

The tunnel composting process is central to the entire composting plant, which comprises the following main treatment stages:

- Waste Reception & De-Contamination
- Shredding & Mixing & Moistening
- Tunnel Pasteurisation & Composting
- Open Windrow Maturation
- Product Refinement, Display & Sales

1.3.1 Waste Reception and De-Contamination

The proposed layout of the man building provides for a large delivery areas for the kerbside collection material and various delivery/stockpile bays for the other organic feedstock as shown on the drawing.

FOGO/GO

Kerbside collection trucks will deliver FOGO/GO material into the main building by reverting back into the designated building delivery area for unloading.

The reception area provides for 2 days storage capacity of un-shredded waste, 1 day storage capacity for the shredded material and 1 day of tunnel raw material storage ie in total approx. 4 days storage capacity. The liquid waste tanks provide capacity for approx. 1 week storage. This is based on the annual average treatment quantities as shown in Table 1Table 1

The main objective of the main building is to manage all kerbside collected waste including other potentially odorous organic waste streams under shelter within a fully enclosed and air controlled building. The building provides for a bunded heavy duty concrete area for contamination screening and interim storage and to protect against weather (rain, sun). This is part of the overall strategy to minimise air emissions (dust, odour), efficiently screen for contaminants and control leachate.

The building contains two separated areas under cover, being

1) The corridor in front of the tunnels, where the FE-loader frequently operates to load and unload the tunnels; and
2) The waste reception, stockpile and pre-treatment area, where all solid organics wastes are unloaded, screened for contamination, shredded, mixed and stockpiled as required.

Kerbside Matrerial De-contamination: At kerbside collected organic waste whether including or excluding food waste has the potential of being contaminated with non-compostable items such as plastic bags or cans (physical contaminants[1]). These items need to be removed prior to the shredding process.

The initial treatment step therefore involves segregation of each load on the floor by means of the FE-loader followed by manual screening and the removal of physical contaminants into separate bins for either landfill disposal or recycling.

In case the kerbside collection material or a high number of distinct kerbside truck loads contains high levels of physical contaminant, (>5%), the process may include a picking line comprising hopper, sorting conveyor with picking line and discharge bay.

[1] Generally referred to as non compostable material, definition as per AS 4454-2012

After physical contaminants have been removed the kerbside material will be pushed onto the stockpile for shredding.

Green Waste: Green waste materials delivered by the public will be stockpiled outside in a designated area as marked on the site plan. An outdoor area of approx. 1500 m2 will be provided to the public for drop off their green waste in order to avoid public traffic to enter the main building. This area will be monitored closely in terms of traffic, and contamination. Batches / bins of green waste will be regularly moved into the building and stockpiled for processing in the designated storage bay.

Shredding: Kerbside material and drop off material (and other bulking agent such as un-treated timber & wood) will be then shredded for the subsequent composting process. A shredder with an integrated screening basket will produce the suitable shredded material blend for the composting process. The shredder will be operated by the FE-loader driver by means of a remote control device and automatically discharges the shredded material into the storage bay for shredded material inside the building.

Mixing: The shredded material will be then fed into a batch type mixer and other higher moistures feedstock materials (DAF sludge, offal, paunch) will be added into the mixer to produce a homogeneous raw material for the tunnel process.

The mixing procedure will accommodate the processing of highly odorous and moistures wastes within 24 hours of delivery.

The mixer will discharge the blended material into the storage bay. The FE-loader will feed the raw material into the next tunnel available. Based on the average daily quantities, we anticipate to loading one tunnel every 3-4 days.

Liquid Wastes: Liquid wastes will be delivered by tankers and alike and pumped into the liquid waste storage tank(s) which is/are equipped with a stirrer and located adjacent to the process water tank as indicated in the layout.

The liquid waste will be added into the process water storage tank (u/ground, sealed and air vented into the biofilter) and recycled back into the tunnel composting process through the sprinkler system. The liquid waste recycling will substitute water in the process and further add nutrients.

1.3.2 Tunnel Composting Process

The tunnel composting plant comprises tunnel modules of a certain size, arranged side by side, a deodorisation stage incorporating a biofilter with integrated humidifier and process water (leachate) collection, storage and recycling facilities as outlined in more detail below.

Each tunnel is self-operating and comprises an air duct system, blowers, process water collection & recycling systems and various process control features (temperature, pressure, etc.). The tunnel floor (ie aeration floor) allows the inflow of leachate and outflow of air into the composting material. Access to each tunnel is via the front door, which can be opened. During the process, the door is locked hermetically to contain any odour and leachate.

The feedstock material is then placed into each tunnel individually and removed after the desired composting time by means of a front-end loader.

Appropriate Technology:

In compliance with the Composting Guidelines, an enclosed composting system has been selected for the treatment of high critical feedstock as per guidelines waste which can potentially generate odour emissions and contain high levels of pathogens.

Other reasons for selecting tunnel composting technology can be summarized as follows:

1. During the composting process there is no need to access the tunnels, thus creating an air tight environment with all process air being collected and either recycled back into the process or cleaned via the biofilter (ie odour free).
2. The process does not employ machinery or equipment in the corrosive environment of a composting process thus significantly reducing maintenance and repair costs and extending the life of the plant (in contrast to e.g. systems, which employ agitators).
3. The on-line control, adjustment, recording and analysis of the process parameters for each individual tunnel on the control computer enables automated operation (no constant supervision required) and guaranteed product hygienisation for each batch.
4. The internal air and process water recycling systems reduces the total air discharge into the deodorisation unit and almost neutralises the water balance (depending on material moisture and climate condition slight water demand or surplus can be expected).
5. The applied pressurised aeration results in a much more homogeneous and thorough material aeration profile for more critical feedstock. There are virtually no anaerobic zones in the composting matrix. As anaerobic zones are responsible for most of the odours originating from the waste, the process air coming directly out of a tunnel contains very low odour concentrations.

6. Under optimal process conditions, the micro-biological decomposition process accelerates in the tunnel and delivers a composted product after 20- 25 days, comparable to 12-14 weeks windrow composting.

7. The system is operationally flexible since composting takes place in discrete batches. Different grades of compost can be created simultaneously with different feedstock. With the tunnel system each tunnel load can be treated independently, making it possible to adapt process parameters for optimal composting when deviations in the waste occur.

8. The system is highly modular, and can be extended in stages to accommodate for quantity increase over the term of the contract. A residence time between 7 and 30 days can be selected depending on feedstock material requirements and desired degree of product maturity.

9. The fully sealed nature of the system protects surrounding building structure, without risk of corrosion, fogging or excessive condensation, thereby extending the life of the building.

1.3.3 Deodorisation Stage

All exhaust air from the tunnels (together with the extracted air from the main building) is finally discharged into the deodorisation stage for treatment and final discharge. The deodorisation stage comprises a fan, the humidifier (or scrubber) and the biofilter facility. The purpose of this stage is to efficiently eliminate offensive odours and deodorise the exhaust air from the tunnel-composting units before being discharged into the open.

The biofilter facility is roofed in order to protect the biofilter material from weather and sun and provide better control over the filter performance (ie consistent moisture and temperature). A suitable media is placed onto the biofilter for the biological removal of odorous compounds. Depending on the type of biofilter material used, the material needs to be replaced every two to five years.

1.3.4 Process Water Collection & Recirculation

Leachate from the tunnels and condensate from associated ductworks (both so-called process water) are collected through a network of sealed pipes and gravity drain into the sealed process water tank. The process water is then recycled back into the tunnel composting process to establish and/or maintain the desired material moisture content.

A pump system fitted adjacent to the enclosed process water tank supplies the process water through a network of pipes and auto controlled valves which is mounted outside the tunnel structure to an array of spray nozzles along the ceiling inside each tunnel. The sprays are arranged in a way to evenly distribute the water over the entire compost surface area.

During the dry, hot period of the year, reclaimed water will be required to cover the water demand for the composting process. For that case make-up water valves have been

fitted to the process water and humidifier tanks, which automatically open when make-up water from the reclamation tanks is required. .

1.3.5 Process Control & SCADA

The process controls in all tunnels are integrated, operated and controlled via a central process control system that consists of a PLC, SCADA system and the process control computer. On the control computer screen the operator can see the status of the composting process and evaluate and adjust process parameters as required.

The proprietary developed process control system also acquires and records the process data and enables the verification of processing time, temperature progression and other data for each material batches required for AS 4454-2012 certification.

The fully automatic operating controlling system will be located in a separate building such as the administration office or a separate control room.

The computer records and stores all instantaneous measurements and cumulative data for each tunnel process run. During the process many different parameters can be shown on the computer screen. The user can create graphic displays to show the desired parameters. This facilitates rapid review, evaluation and adjustments (if necessary) of the composting process.

The constant monitoring of process data, data acquisition, recording, together with the SCADA tools, such as data evaluation & visual presentation enables the operator to on-going review the process performance and optimise process parameters in terms of energy efficiency, product quality and other environmental criteria. Regular SCADA software updates will be provided to improve operating monitoring features and control systems.

1.3.6 Open Windrow Maturation & Storage Area

After the tunnel composting process, the raw compost is pasteurised, composted an free of any offensive odour and the biological activity has significantly declined which allows outdoor processing such as curing, refinement and storage without the risk of emitting offensive odours.

An approx. 1 hectar large area will be provided adjacent to the tunnel composting plant for further maturation (up to 6 weeks), product stockpile and product refinement.

The material will be set up in windrows, which usually are about 2.5m height, and approx. 4 m wide at the base. The length of each windrow and the number of rows reflects operational requirements.

Water for windrow moistening (if required) could be provided from the stormwater dam through a pump and sprinkler system.

The windrow quality control includes temperature monitoring and process documentation procedures (ie date of laying, volume/ composition of each windrow). We expect the moisture content to drop from around 44% to 30-35% during maturation.

The windrow area provides additional storage capacity to accommodate for supply / demand fluctuations over the year.

The windrow area will have a simple consecutive numbering system permanently fixed in front of the perimeter but not interfering with the normal operational activities of the facility.

A compost register will be kept for traceability, quality control and monthly stock reports detailing the date, windrow number, corresponding batch number and operator who placed the feedstock into the windrow, other relevant upstream information such as weight dockets will also be included. The entry will be made in the register at the start of the windrow formation. Typically each batch will be identified by the week and year (wwyy) it was formed.

1.3.7 Compost Grading & Product Display

The plant shall produce various grades of mulch, compost and soil conditioners to AS 4454-2012 (and possibly other) standards and in accordance with the final market requirements.

For that purpose a mobile trommel screen with a magnet to remove remaining metal items (eg nails) from the final product will be employed.

The screening process produces discrete particle size ranges ie different product grades such as

- <16mm (soil conditioner, fine compost)
- >16mm (much, landscaping product)

The facility includes a product display and sales area with several display bins as shown on the site plan.

Customers will be directed through the weighbridge to the product display & sale area. Different products will be stored in different display bins.

The FE-loader operator will serve the customer and load trucks and trailers etc., which will leave the site via the weighbridge facility.

1.4 Operational Information

1.4.1 Truck Turnaround Time

The truck turnaround time within the new facility will be in the order of 5-10 minutes. The trucks will be processed and weighed at the weighbridge facility before driving into the main building for unloading.

The trucks only need to reverse back into the building for unloading and can leave the facility via the same road. The main building has sufficient area for unloading of two trucks simultaneously thus avoiding any waiting time.

1.4.2 Processing Sequence

Pre treatment of delivered waste will occur soon after delivery (real time processing), unless unscheduled down times require processing after hours or later. Sufficient under cover storage will be provided in the reception area as contingency for the unlikely event of those unscheduled downtimes. The facility will therefore be able to receive waste during these times.

The tunnel process comprises two stages for pasteurisation (14 days) and composting (14 days). After the first stage, the tunnel batch would be loaded into another tunnel for the second stage processing.

During the first 14 days cycle, the material will be pasteurised (55-65 ºC) to destroy pathogens and denature weed seeds. Outside the pasteurisation stage the process is controlled in order to enhance biological activity and maximise decomposition rate, which is best achieved at around 50-55 ºC and around 45-55% moisture content.

Process water recirculation and moistening will only occur up to the hygienisation stage to prevent re-infection of the compost and strict compliance with the regulations.

1.4.3 Hours of Operation / Delivery Hours

It is envisaged to staff the facility for a 1-shift operation with opening hours to accommodate for the kerbside truck deliveries and compost sales to the public.

The weekend is reserved for repair and maintenance works, as a contingency to compensate for unexpected equipment down times or during peak delivery periods and for compost sales and deliveries.

Running times for non-continuously working equipment will be approx. 6 hour per day. This includes as required shredding, windrow turning, screening and tunnel loading/unloading.

The composting process is a continuous 24 hour process during the tunnel cycle. Accordingly, blowers, fans and pumps are operating continuously and also after hours and during weekends albeit at reduced capacity (average ~50% of connected load). Fans and pumps are low noise emitting equipment and ensure that noise emission from those equipment will be within applicable regulative limits.

The process automation and control system controls the tunnel composting process during the absence of staff, and can be accessed from a remote location via modem in case of unexpected equipment faults in order to undertake the necessary steps to keep the operation of the plant in stable conditions.

1.4.4 Staffing Levels

The staffing requirements are comparatively low, given the high degree of automation of the tunnel composting process. Reliable equipment further reduces supervision requirements and also time required for maintenance & repair works. Proactive maintenance schedules assist the operation in the effective management of the plant.

The following works and associated labour will be required:

- One experienced FEL operator will be able to manage deliveries, the feeding of the shredder and the loading of the tunnels (first stage).
- A second loader driver to manage all pasteurised material streams such as unloading and reloading tunnels, transport to curing area and feeding screens etc
- Additional (casual) workers are required for load screening and contamination removal on the floor, subject to the level of contamination in each individual load.

One of the two drivers ideally has mechanics or boiler maker skills to undertake basic services and maintenance works. Alternatively, a hands-on yards man would be responsible for daily maintenance routines.

Plant manager to oversee the operation, staff and SCADA supervision and coordination of works as required within the overall management structure of Council

1.4.5 Machinery and Equipment

A list of plant and equipment permanently employed is shown the following table:

Table 3 : List of Vehicles and Major Equipment

Item	No	Purpose	Features	Comment
Mobile Machinery				
Shredder	1	Shredding of green waste and other feedstock materials	Integrated screen basket	Mobile/Electrical Unit
Front-end Loader	2	Movement, turning of green waste and mulch, Loading of bulk product onto trucks	Air conditioned cabin, low emission	CAT 924 G or equivalent
Trommel Screen	1	Screening of material into various grades for end-market supply	Removable screens, different mesh sizes	Mobile equipment, diesel driven
Fixed Machinery				
Tunnel Fans	7	Air supply to Tunnels	Blowers	72 dB(A)
Biofilter Fan	1	Air Supply to Biofilter	Blower	75 dB(A)
Process	1	Process Water Recirculation	Centrifugal pump	Approx. 5 kW

Water Pump				
Humidifier Pump	1	Water supply into humidifier	Centrifugal pump	Approx. 9 kW
Dam Pumps	1	Supply of dam water to composting operations	Self priming	Diesel driven
Air ducts	1 lot	Tunnel Aeration System	High grade aluminum	
Process Water Pipes	1 lot	Process Water collection & recirculation	N/PVC or equivalent	

1.4.6 Electricity & Fuel Consumption

The following mobile equipment will be employed for the operation:

- Shredder (diesel/electrical driven)
- Compost Screen (diesel driven)
- Front End loader (2, diesel driven)

The total diesel consumption can be estimated to around 120,000 litres per year. In case the shredder is electrically driven (200-250 kW connected load), the fuel consumption would drop to approx. 60,000 liter per annum.

The total power supply requirement (connected load) for the tunnel composting plant can be estimated to around 200 kW) which includes 170 kW for the tunnel composting process with the remaining power required for general building services. Tunnel fans and the biofilter blower run around 30-50% load on average over 24 hours.

The total electricity consumption for the tunnel composting plant (excl. Shredder) has been estimated to around 150,000-180,000 kWh per year.

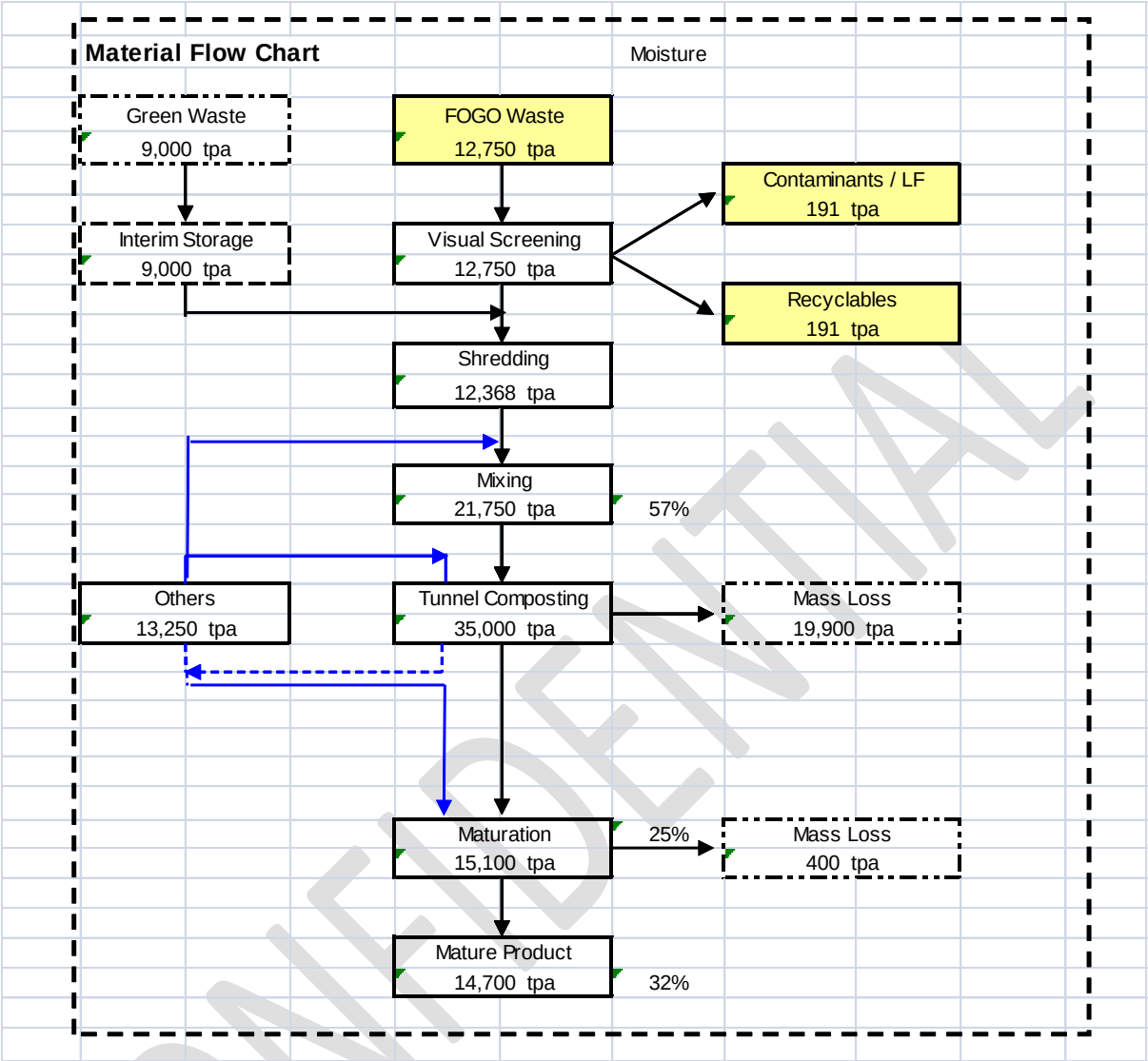
1.5 Mass Balances - Indicative

The balance is based on 35,000 tpa input as specified in the Table 1.1. and approximately 32% moisture content of the mature product (before screening). Also not included in above estimate are any evaporation losses during handling and storage.

Depending on the actual moisture content of the waste material delivered to the site, we expect that approx. 5 ML of water will be required for the entire composting process per year. This can be sourced from reclaimed sources (ie stomwater & leachate dams).

The tunnel composting process will achieve a turn-over rate of around 30% BVS based on 2 x 14 days residence time in the tunnel.

The following flow charts provide indicative mass balances for the facility:



Mass Balance Indicative

Table 4: Composting Facility Input & Output

Stream	Material	Average Throughput		Totals	
		(tonnes/yr)	(m^3/yr)	(tonnes/yr)	(m^3/yr)
Input	FOGO	12,7500	28,000		
	Green Waste	9,000	26,000		
	Other	13,250	16,500	35,000	80,500
Output	Unscreened Compost	14,400	29,000		

1.6 Maximum Stockpiles

Based on the 35,000 tpa input material the following storage and stockpiles areas are provided (average, refer to Table).

Table 5: Maximum Stockpiles

Material	Stockpile (m^3)	Area (in m^2)
Kerbside Material / Decont.	400	150
Shredded Material	400	180
Tunnel Raw Material	500	200
Maturation Area	3,500	6,000
Product Storage / Display	0-2000	4,000

Product stockpiles will fluctuate seasonally according to market & sales fluctuation. The windrowing volumes are based on the weeks windrow curing period.

1.7 Footprint of the Facility

The area requirements for the 35,000 tpa composting plant are given in the following table (please refer also to layout drawings). The main building area includes reception & stockpile areas for the raw material and some finished product and the tunnel hallway in front of the tunnel block. The biofilter area will be also roofed.

Outdoor storage areas refer to the windrow curing, the outdoor stockpile of finished product and refinement.

Table 6: Area/Volume Requirements

Facility Module	Area (in m^2)	Building Volume (height in meters)
Buildings		
Main Building	2700	21,600 (8.0)
Tunnel Composting Modules	1500	7,500 (5)
Office, Education Building	TBA	TBA
Roofed Areas		
Biofilter	450	2025 (4.5)
Open Areas		
Maturation, Stockpile, Refinement	10,000	outdoor
Traffic, Other	10,000	outdoor

2 PROPOSED ENVIRONMENTAL MANAGEMENT SYSTEM

It is the intention of the applicant to seek ISO 14001 EMS Accreditation for Recycled Organics Production.

Composting operations whilst fundamentally designed to recycle waste otherwise destined for landfill pose significant potential environmental impacts influenced by feedstock, technology and management.

The proposed tunnel 'in-vessel' system being classed as 'Best Practice' technology for composting by EPA is equipped with 'total automatic control' ensuring conformance to the most stringent EMS and auditing process.

Our preference for accreditation provides a vehicle for:

- Certainty for legal compliance.
- Improved relationship with regulators.
- Public and client perception of the company as environmentally responsible.
- Employee awareness of environmental issues around everyday operational activities.
- Minimising waste.
- Continual improvement

The ISO 14001 EMS will be based on the principle of continual improvement of processes, which may impact on the environment, potential impacts on the environment are:

- Storage and handling of feedstock
- Air quality – odour, dust
- Leachate control
- Ground water quality
- Stormwater runoff
- Noise
- Litter
- Others

The ISO 14001 certification will demonstrates commitment to maintaining and improving environmental performance and leads to a competitive advantage and improved performance through the intense scrutiny of the business operations.

The following DRAFT EMP outlines the principles, which will be completed during the commissioning period off the plant and integrated into the operational procedures.

2.1 Compost Products

2.1.1 Objectives

A compost product must not be applied (or sold or supplied) if it contains contaminants or pathogens at a level likely to contaminate the land or pollute surface waters or groundwater by leachate run-off from the land. The product must not pose a health risk – for example by causing contamination of food derived from the land.

2.1.2 Description of the Management System

The facility will produce mulch and compost based products of superior quality and to the local market requirements. Source Separated organic waste will be the main feedstock material, which will be pre and post treated to remove physical contaminants and provide consistency into the process.

Compost analysis results from similar operations provide an indication about the likely product quality derived from such an operation:

Organic matter	>50%
PH	6.5 – 7.5
Moisture	30-35%
C/N	~15
N	0.5-1.5%
P	0.1-0.2%
K	0.2-0.5%
HM	in Compliance with AS 4454

Regular sampling and testing regime will be implemented in compliance with the existing regulations, standards and guidelines.

Any product that does not meet the requirements for the market or standards will be reprocessed until it meets the requirements.

2.2 Odour

2.2.1 Objectives

Organics Recycling and waste processing facilities generate odour from the storage and handling of putrescible waste and during biological decomposition of organic material during the composting process.

To provide a basic level of protection from odour, dust and noise, the composting plant will be located in an area with sufficient buffer distance to residential and other sensitive development.

The following management system will be set into place in order to ensure compliance with regulations and to achieve best practice operation.

2.2.2 Description of the Management System

Offensive odours are generated when anaerobic conditions occur. These occur when material is too wet, when piles are too large, when piles are turned infrequently stockpiled over long periods, or when there is insufficient structure in composting material.

Odours potentially generated during the tunnel composting plant operation refer to:

- The reception & pre treatment areas inside the main building
- Outdoor maturation, product stockpile and screening area;
- The biofilter; and
- During tunnel filling and material handling procedures

The following odour management principles and detailed catalogue of design/operational measures will be implemented to minimise odour generated from the facility at each operational stage.

2.2.3 Principles

Principles for odour containment strategy are:

- Areas of high odour emission generation will be minimised and process stages, which are a source for offensive odour release will be fully enclosed (eg tunnels, ventilation system, humidifier, process water tank, liquid waste storage tanks);
- The main building will be fully enclosed, air ventilated and the extracted air will be discharged onto the biofilter for treatment
- All access doors to the main building will be fast speed roller shutter doors which will be kept closed when not in use
- Odorous air will be recycled into the tunnel process as far as possible in order to minimise the total air volume (m^3/hr) released from the biofilter facility;
- Only proven and reliable air handling equipment (ie fans, scrubber, ducts) will been installed, with contingency provisions to minimise down times (repair, maintenance)
- Fully sealed tunnel concrete structure with lockable and rubber sealed doors;
- A two stage deodorisation unit (ie humidifier, biofilter) with performance monitoring and control procedures to achieve high and consistence performance

2.2.4 Pre-Treatment

All kerbside organics delivered by kerbside collection trucks (and potentially other means) will be processed on a daily basis ie under normal operation there will be no stockpile of unprocessed material over night.

All pre treated material will be fed into the next available tunnel and stockpiled inside the dedicated storage bay until the desired batch volume has been reached.

Other possible blending agents such as pine bark, saw dust, timber, wood etc. may be stockpiled for longer than 1 day periods prior to processing, as they do not generate offensive odours under aerobic conditions.

A purpose designed shredder will be employed, which produces a homogeneous product of a maximum defined particle size. Particle size can be adjusted through different screening baskets to meet the composting process requirements.

The shredding process ensures optimum structure & air porosity and provides air/oxygen into the shredded material [2] to prevent offensive odour to mitigate from the shredded material storage area inside the building.

A purpose designed mixer will blend the highly odorous wastes with the shredded material and reduce the odour levels during storage time through mixing within 24 hours of delivery.

2.2.5 Composting

The so-called 'tunnel composting' employs high rate forced aeration, which drives & controls the biological decomposition process fully automatically.

Process parameters such as material and air temperature individually control the aeration intensity and the fresh/recycled air ratio in each tunnel. This ensures that aerobic conditions are being maintained during the entire composting process and across the entire material batch.

All process parameters are programmed and monitored in real-time through the PLC based process control system with process visualisation PC and SCADA software. Individual tunnel process parameters can be modified by the authorised plant supervisor at any time during the process.

The purpose designed floor provides an even air flow across the surface and into the material.

The system maintains a slight vacuum in the tunnel also outside the composting sequence thus containing any potential odorous air during loading and unloading activities (ie while the door is open).

Pressure and moisture sensors on-line monitor the air conditions in the aeration system (ducts, blowers, pipes) and signal any deviation from normal operation to the supervisor via optical/acoustic alarm.

[2] shredding has a similar effect as (windrow) turning as such that it keep the pile aerobic for a 3-4 days.

Any possible repair and maintenance work (on ductwork, blowers, pipes etc.) can be carried out on a tunnel without the need to shut down the entire plant or access the tunnel (confined space). This contingency provision allows scheduled maintenance to be coordinated with tunnel filling / emptying sequences without slowing the production rate.

After one tunnel cycle, the product is fully matured, pasteurised, with the desired moisture content and free of any offensive odour to be suitable for outdoor stockpile, testing, batching, and sale.

All excess air from the tunnel composting facility is drawn via a duct system through the integrated operated blower system to the deodorisation unit for cleaning.

2.2.6 Deodorisation

All excess air from the tunnel composting plant and the main building air extraction system is drawn via ducts into the biofilter fan and further blown through the humidifier into the biofilter facility. The combination of humidifier and biofilter guarantees a reliable performance and achieves odour removal efficiencies of more than 97%.

The humidifier is a sub ground sealed concrete chamber with an inlet and outlet opening. The odorous air from the fan enters the chamber through the inlet, passes a water curtain at the chamber outlet before being discharged via manifold into the biofilter basement.

A submersible pump recirculates water through an array of spray nozzles (water curtain) thus establishing ideal air conditions (saturation, temperature) for the subsequent biological filter. The humidifier also works as initial odour removal stage and mixing chamber for the subsequent biofilter in levelling air temperature and moisture.

Pump operation, water level and air conditions in the humidifier are monitored on-line and controlled via central process control. Water is added automatically to the humidifier as required through a water connection valve.

The biofilter facility consists of a filter bed filled with a 1m thick layer of composted material (roots, bark, humus, compost), which is sitting on the biofilter basement. The conditioned odorous air streams into the basement and moves slowly upwards into the filter material.

The design of the biofilter guarantees an even air flow, homogeneous air distribution and consistent air residence time in the filter material to optimum performance. High biological activity in the filter material is achieved through the constant supply of nutrients (volatile organics) and moisture, both introduced with the odorous air.

A roof structure over the biofilter protects the filter material from sunlight and rain in order to maintain stable filter material conditions (temperature, moisture) independent of weather conditions.

The total exhaust air volume onto the humidifier / biofilter facility will be max. 42,,000m^3/hr (35,000 tpa) with (non offensive) surface emission not exceeding the equivalent of 500 OU/m^3 and over the biofilter surface area of about 420m^2.

The biofilter design is based on proven technology and provides the most efficient solution for biological processes. Low operating costs and operational consistency are further design features of the system. Emissions from the deodorisation unit are basically free of offensive odour, bio aerosols and dust.

The deodorisation system will continue to be operational during scheduled and unscheduled down-times of any part of the process thus ensuring odour control during those times.

Biofilter performance indicators are monitored via the central process control computer. The discharge limits will be established during the design stage and based on the site conditions (meteorology) and sensitive receptors in the neighbourhood. An odour dispersion model will be carried out for that purpose to provide proof about the compliance if required.

2.2.7 Maturation, Product Storage & Screening & Display

After the 28 days tunnel composting process, the product will be well matured in compliance with AS 4454-2012 for composted materials. All easily degradable organic substances will have been decomposed. Therefore the surface odour emissions from the maturation area will be minimal, comparable to emissions from compost product stockpiles. Also no turning of material will be required removing another potential source for instant release of odour emission.

The remaining surface odour emission released from this area will be therefore minimal and not offensive due to the nature of the mature material.

The areas will be monitored daily and in the event of an unexpected odour formation (eg during a longer rainfall period) material stockpiles will be turned and moved with the FE-loader to keep the material aerated.

2.2.8 Process Water Collection & Recirculation System

The entire process water (leachate, condensate) collection system consists of a fully sealed piping network, which connects to a sealed u/ground process water tank.

Any leachate and/or condensate water which would be an obvious source of odour drains into the process water tanks and is recycled back into the tunnel via a pump and sprinkler system to maintain the desired moisture level in the material.

2.3 Dust (Airborne Particulate)

2.3.1 Site Preparation Work

Site preparation activity can generate particulate emissions from many sources. Common construction phase emissions can be described generically according to the plant and equipment used and the activity undertaken. Common sources of particulate emissions during those activities include unsealed roads or work sites, vehicle movements, loading and transfer of overburden from excavation, movement of equipment and spoil stockpiles.

As the site preparation period and the scope of work will be minimal (site levelling, drainage works), we do not expect significant emissions during that period. Nevertheless, the following catalogue of measures will be considered to minimise the effect of particulate impact during the site preparation period:

- Ground surfaces and materials that have the potential to produce dust will be kept damp
- Work schedules will be co-ordinated to avoid delays in construction activities resulting in disturbed land remaining exposed
- Vehicular access will be maintained on appropriately designed roads
- Exposed surfaces are minimised during dryer seasons of the year (work will be undertaken in summer)
- Minimised stockpile exposure to wind
- Minimised stockpile slope
- Maintenance of moisture levels in the piles to reduce dust suppression

2.3.2 Operation

Neither delivered organic waste nor mulch or compost are significant emissions of dust due to the nature of the material (moisture >30%).

Dust may however be generated during windy and dry conditions depending on the surface quality and maintenance. In order to control dust, a combination of the following measures will be applied:

- All processing of incoming material will be under cover in the main building, which comprises a roof and 4 meter high subdivision walls to protect against wind.
- Sealed surfaces (traffic, reception, processing areas) and regular maintenance and if necessary moistening will ensure that minimal dust is generated in these areas
- All external traffic will be restricted to the sealed or hard stand areas of the plant.

- Unsealed gravelled roads and traffic corridors will be monitored and if necessary moistened with a water cart;
- Real-time processing will minimise stockpiling of incoming feedstock prior to pre-processing and composting
- Water spraying of stockpiled material (indoor/outdoor) will be either by sprinkler system or by mobile water cart if required
- The biofilter comprises a roof which in combination with the humidified inlet air will keep the material moist and prevent any dust generation from the filter material.

2.4 Greenhouse Gases

The tunnel composting process control system closely monitors the process conditions to avoid anaerobic conditions, and hence any methane emissions, from occurring. All processing air is collected and treated through an aerobic filter (biofilter), which would remove (oxidise) any methane traces prior to discharge.

The facility will be operated on a real-time basis, with no stockpiling of materials for long periods.

The composting of green waste is a net sink for GHG emissions compared to the current practise, which is predominantly landfill disposal. One tonne of green waste can contribute up to 50 m3 of methane over the life of the landfill and depending on the disposal environment.

2.5 Process Water Management

The organic loading of the so-called process water, which includes leachate, run-off and condensate from the composting tunnel and ducting systems ranges between 500 and 5,000 ppm (BOD). It also can contain suspended solids (SS) of up to 1,000 ppm.

For that reason, the plant will be designed to contain the process water within a sealed system and separated from other surface water systems. Due to the net water demand of the process, there will be no need to discharge or dispose process water at any time of the process.

A range of design features and operational measures will be employed to control any process water generated during the plant operation. These are:

- Recirculation of all process water straight into the composting process; due to the loss of moisture through the aeration and biofilter system (1 m^3 air (35C, 98% humidity) carries approx. 0.04 kg water), there will be no surplus process water from the plant under normal operating conditions

- Process water and condensate will be collected in a network of ducts and pipes, which drain ultimately back into the process water tank;

- A system of siphons (waterlock) will prevent the collection & drainage piping from clogging. The siphons, which are connected to the leachate collection pipe collect suspended solid and settled material. They will be monitored and cleaned as required. Sludge and sediment will be recycled back into the composting process.

- Level indicators in the humidifier and the process water tank control water levels and feed back to the central process control. Storage levels and water recirculation (tunnel spraying system) will be automated controlled and monitored procedures. Additional water for the process water tank can be drawn from the leachate dam/channel if needed.

- All surface water generated inside the ('no waste') outdoor operating areas including the windrow curing area will be collected and diverted into the dam for re-use (windrow irrigation, PWT make-up).

- A rainwater reclamation system will be provided to collect from the roofed areas for utilisation in the operation, potentially toilet flushing or other purposes.

- In order to maintain the required moisture level of the tunnel material, process water will be recycled into the tunnels. For that purpose, a sprinkler system will be installed in each of the tunnels, which allows for individual irrigation of each tunnel. The system comprises a pump, valves and temperature and corrosive resistant ducting. Nozzle sprayers in each tunnel will provide for an even irrigation pattern over the full tunnel (material) area. The irrigation system will be integrated into the automatic process control (SCADA) system.

2.6 Leachate Management

Unprocessed kerbside organics containing food waste will be only handled inside the main building area and the tunnels.

Outdoor stockpile will only occur for the drop off green waste, which however has very limited potential to generate leachate as per definition (has been in contact with "waste").

All stormwater runoff from these areas together with other outdoor compost material handing areas will be diverted into a leachate dam.

- The leachate dams levels will be kept low to maximise the buffer capacity in the event of heavy rainfall.

- For storm events of greater magnitude than the 1 in 10 year ARI storm event, leachate will be recycled back to the windrows within their respective for evaporation to ensure that leachate is not released into adjacent surface water or groundwater systems

The general experience with green waste feedstock shows that the 'take-up' of moisture from rainfall events is significant, giving rise to minimal run-off, hence windrow moisture content is not expected to exceed 55% at any time of the process.

An audio and visual high-level alarm will be installed in the dam to alert the operational staff of critical dam capacity including a remote controlled electric pump installed in the leachate dam

2.7 Storm Water Management

Roof water from the main building will be collected in a reclaimed water tank attached to the main building and utilized (filtered) as portable water and for staff amenities in the administration building. Roof water can be also used to top up water into the process water tank if need be. Any surplus will be discharged into the stormwater dam.

The stormwater dam will be sized to provide the necessary storage capacity for any stormwater run-off from other open areas which have no contact to waste or compost in a 1 in 10 year rainfall (24h duration) event.

2.8 Erosion and Sedimentation Control

In order to control erosion and sedimentation during this period, the following strategies will be undertaken:

- Construction of diversion drains to protect the site from external runoff;
- Grading of site for interception by the proposed drainage system; and
- Appropriate surface and compaction provision
- Landscaping will be applied around the boundary of the site to provide some initial shielding against wind;
- Traffic is only allowed on sealed & hardstand areas. Only bin and truck storage, parking on non-sealed surface.
- During facility operation, any sediment will be intercepted by the on-site drainage system and contained.

2.9 Groundwater Protection

Waste material, which may have the potential to generate contaminated leachate will only be handled within the sealed areas of the main building and tunnels. The floor will be heavy duty (approx. 200mm thick) concrete floor with plastic liner and sealed joints.

On non-sealed areas, only processed mature compost and mulch materials will be handled. This includes screening, truck loading and stockpile for display. All these areas will be located within the perimeter bund of the operation.

The dams will be constructed and lined to achieve the necessary permeability as per Draft Guidelines. The entire composting process will take place either on clay lined and bunded areas or within fully enclosed concrete built tunnels, which

There will be no discharge of any water from the process at any times and chance of groundwater contamination from the proposed facility.

2.10 Noise

Noise nuisance from the facility may arise from the use of both mobile and fixed machinery, and from movements of transport servicing the site.

The on-site mobile and fixed equipment consists of (max. sound power level/item in brackets):

- Shredder (1) – 115 dB(A) indoor
- Mixer (1) – 90 dB(A) indoor
- Trommel screen (1) – 85 dB(A) outdoor
- Tunnel (6) and biofilter (1) blowers outdoor
- Front end loader (2) – 101 dB(A) indoor / outdoor
- Transport trucks – 109 dB(A) outdoor

Apart from the blowers (24/7), all equipment will be operating only on working days during the day period (working days time between 7 am and 6 pm). The blower sound pressure levels are average 50% capacity (normal operation) are 72 dB(A). They are a not intermitting noise source.

To minimise the noise emissions from the facility, the on-site management measures will comprise a combination of:

- Fitting and maintenance of appropriate mufflers on mobile equipment;
- Installation of noise hoods on engines and enclosure of noisy equipment; and,
- No operations after 6 PM on weekdays or on the weekend.

2.11 Litter

Mixed Solid Waste as the main source of litter will not be accepted at the facility, eliminating the potential for loose plastic and paper wastes to become litter.

The on-site management system to protect the local environment from litter leaving the facility will consist of:

- All processing of incoming material will be under cover in the main building complex, which comprises a roof and 4 meter high perimeter walls to protect against wind.

- All incoming Green Organics will be manually inspected and contaminants, including litter, will be removed and placed into bins;

- Contaminants removed from the feedstock will be held in bins (240 MGB, skip bins) until transported off-site to a suitable disposal facility

- The facility will be regularly cleaned by sweeping and the site sealed to avoid depressions and accumulation of litter

2.12 Insect and Pest Control

The management system, which will be used to minimise the incidence of vectors will include:

- Minimising the amount of raw materials stockpiling prior to processing;
- Regular agitation of stockpiled materials through loading and unloading, material movement will limit the opportunity for rodents and other pests to nest;
- No open stockpiling of unprocessed waste longer than a day;
- Control litter;
- Provision of perimeter fencing and gates to prevent larger pests such as rabbits and foxes from entering the site; and
- Closing and locking gates to the facility when not in operation.

2.13 Pesticides and Herbicides

The management system at the proposed facility to minimise the impacts of residual herbicides and pesticides will include:

- Inspection of incoming feedstock and interception and rejection of feedstock that has obviously been subject to herbicide and or pesticide application, for example, blackberries, etc;
- Only accepting source separated feedstock for processing; and
- The water management system has been designed for 100 % re-use of process water;

2.14 Flora and Fauna

The management system to minimise the flora and fauna impacts of the proposed facility will consist of:

- Ensuring all incoming vehicles are covered to minimise export of seeds off-site during transport and delivery;
- Inspection of incoming feedstock and interception and rejection of feedstock that is obviously diseased or contains noxious weeds, for example, prunings from diseased elm trees, blackberries, etc;
- Properly managing the composting process to destroy pathogens and weed seeds;

- Using appropriate handling, dust and litter control procedures to minimise off-site emissions;
- Suspending emission relevant activities if the climatic conditions are unfavourable; and
- Minimising stockpiles to reduce the likelihood of feedstock being distributed off-site.

As part of the quality plan, product will be regularly tested to ensure standards compliance and thereby minimise the risk of adverse impacts on flora and fauna arising from product end use.

2.15 Fire Contingency

The fire contingency provisions will be design in accordance with the local FCA requirement and include the stormwater dam, diesel driven pumps additional stormwater tanks etc.

A minimum of 50 kL will be store in the stormwater dam and tank to provide sufficient storage capacity

The management system will enable a significant degree of protection against internal fire events:

- Minimal stockpiling of material on site prior to processing;
- Continual moisture monitoring and watering of composting material as required;
- Fire fighting vehicular access into and throughout the facility will be maintained at all times.

PITT & SHERRY

Tamworth Organic Recycling Facility

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SHEET LIST

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Notes
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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
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Drawing title
TITLE SHEET

Date created	Checked	Approved
06-09-19	LE	-

Scale
@ A3

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Project number	Drawing number	Revision
19013	**DA000**	P2

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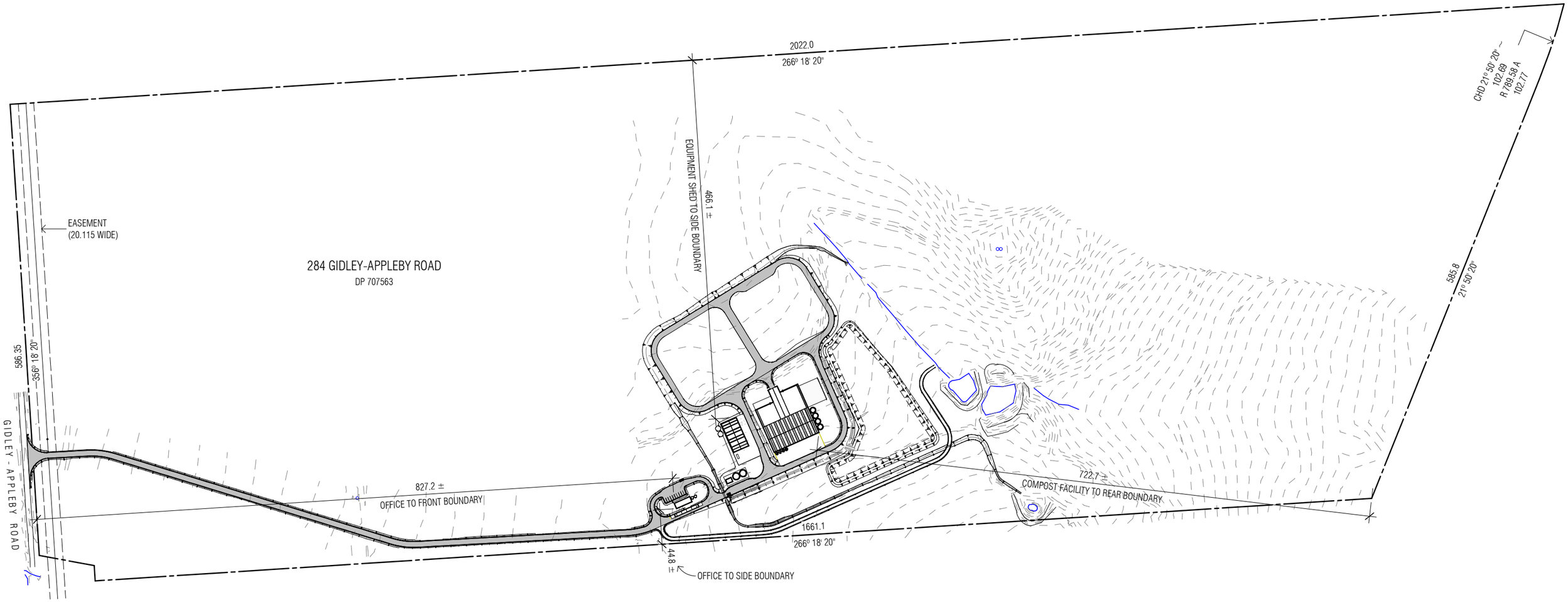

01 SITE LOCALITY PLAN

SCALE 1 : 5000

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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

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SITE LOCALITY PLAN

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Project number 19013
Drawing number **DA001**
Revision P2
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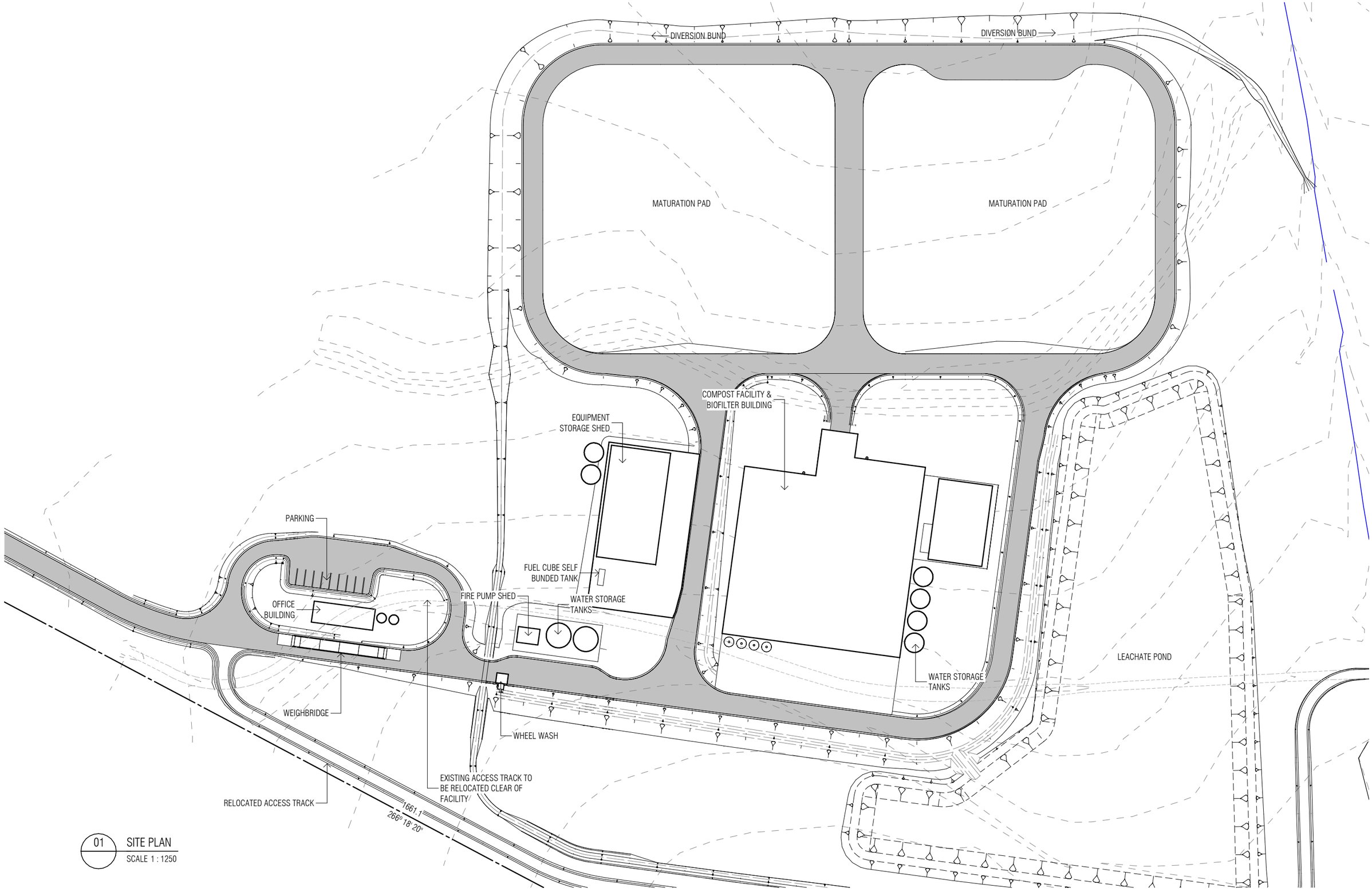

01 SITE PLAN
SCALE 1 : 1250

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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
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SITE PLAN

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Project number 19013 | Drawing number **DA002** | Revision P2
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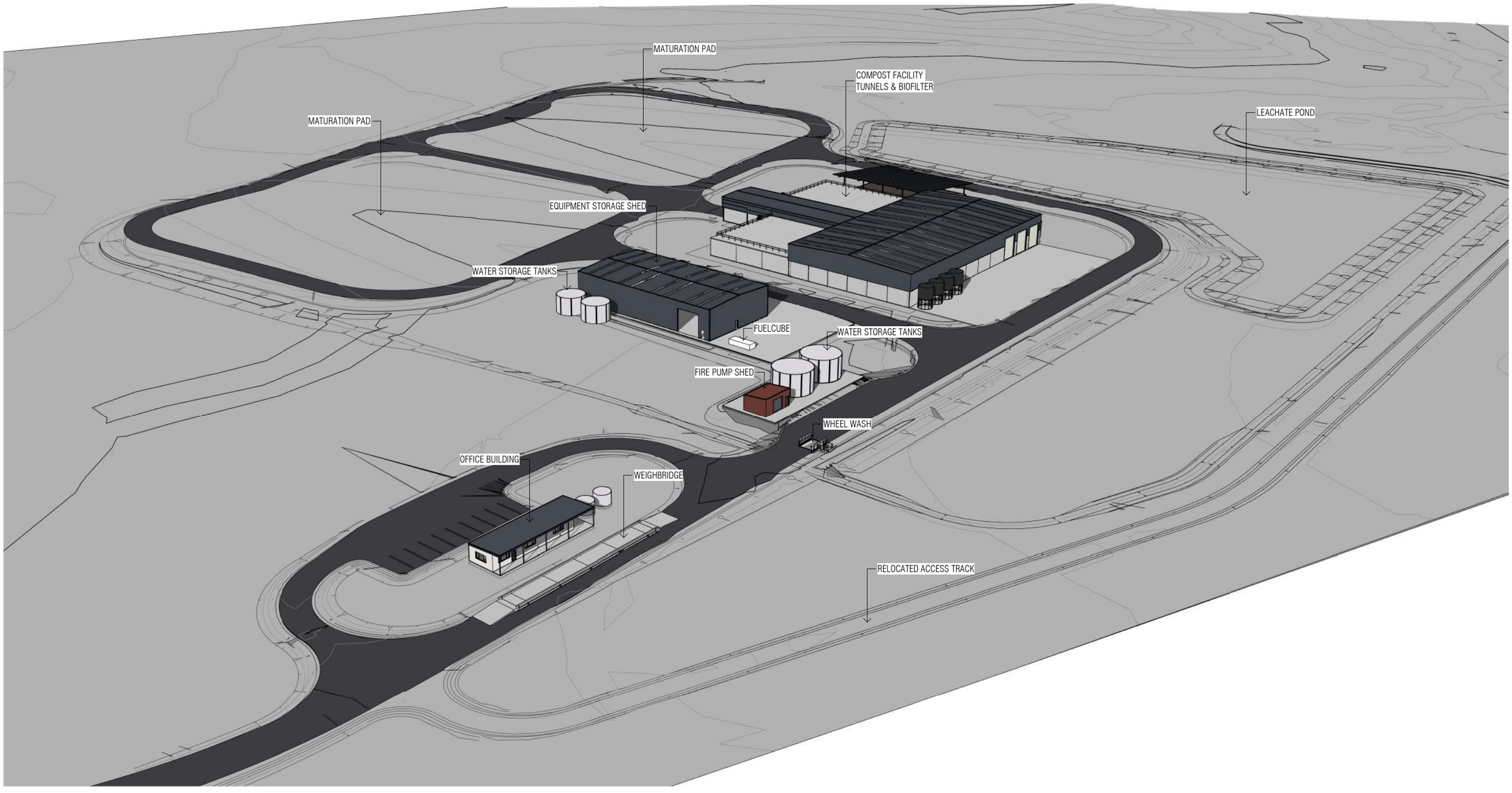

01 3D PERSPECTIVE

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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
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Project
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Drawing title
SITE - 3D PERSPECTIVES

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02-09-19	LE	-

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Project number	Drawing number	Revision
19013	**DA003**	P2

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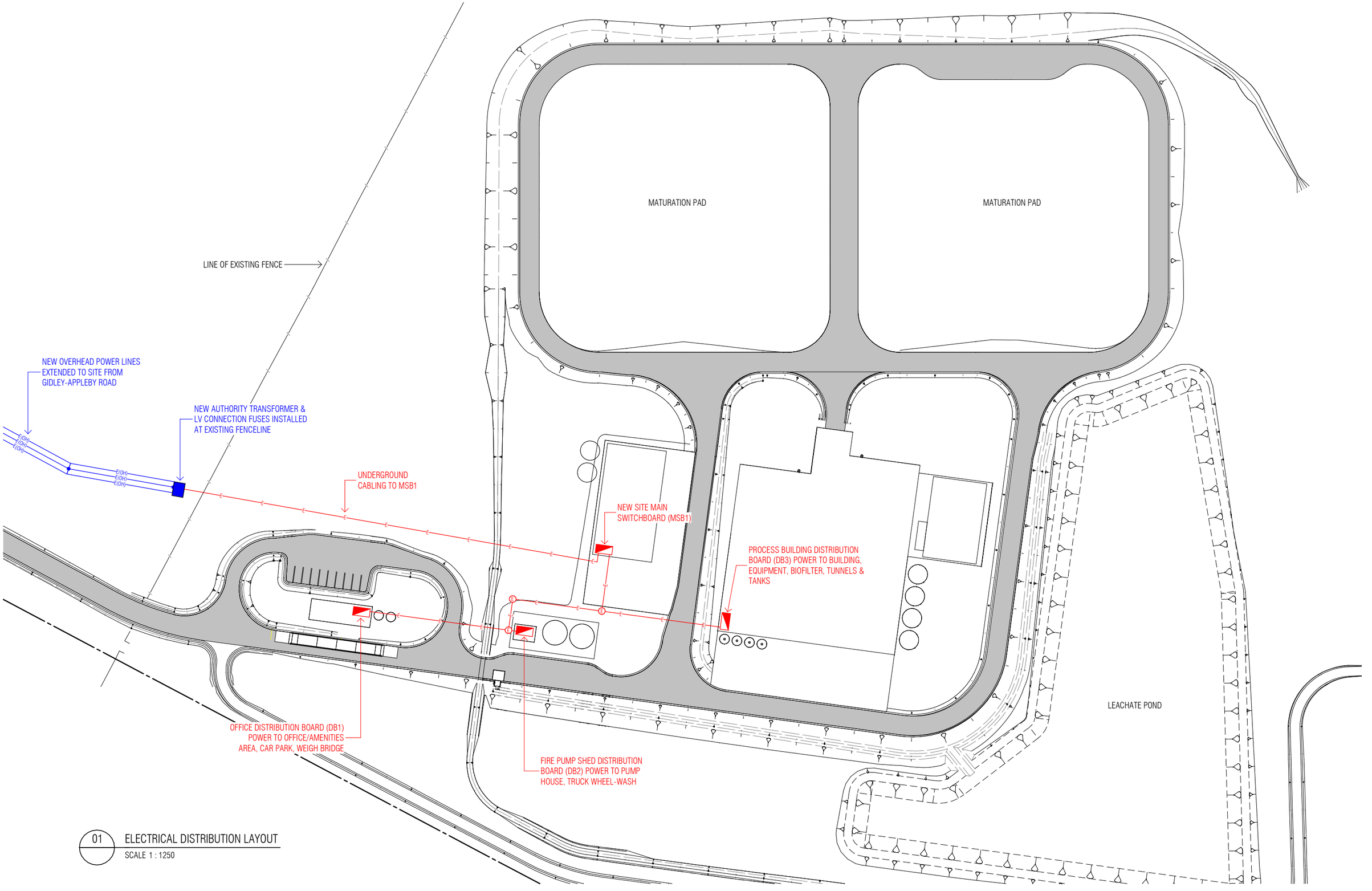
PRELIMINARY



01 ELECTRICAL DISTRIBUTION LAYOUT

SCALE 1 : 1250

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ELECTRICAL DISTRIBUTION LAYOUT

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1 : 1250 @ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
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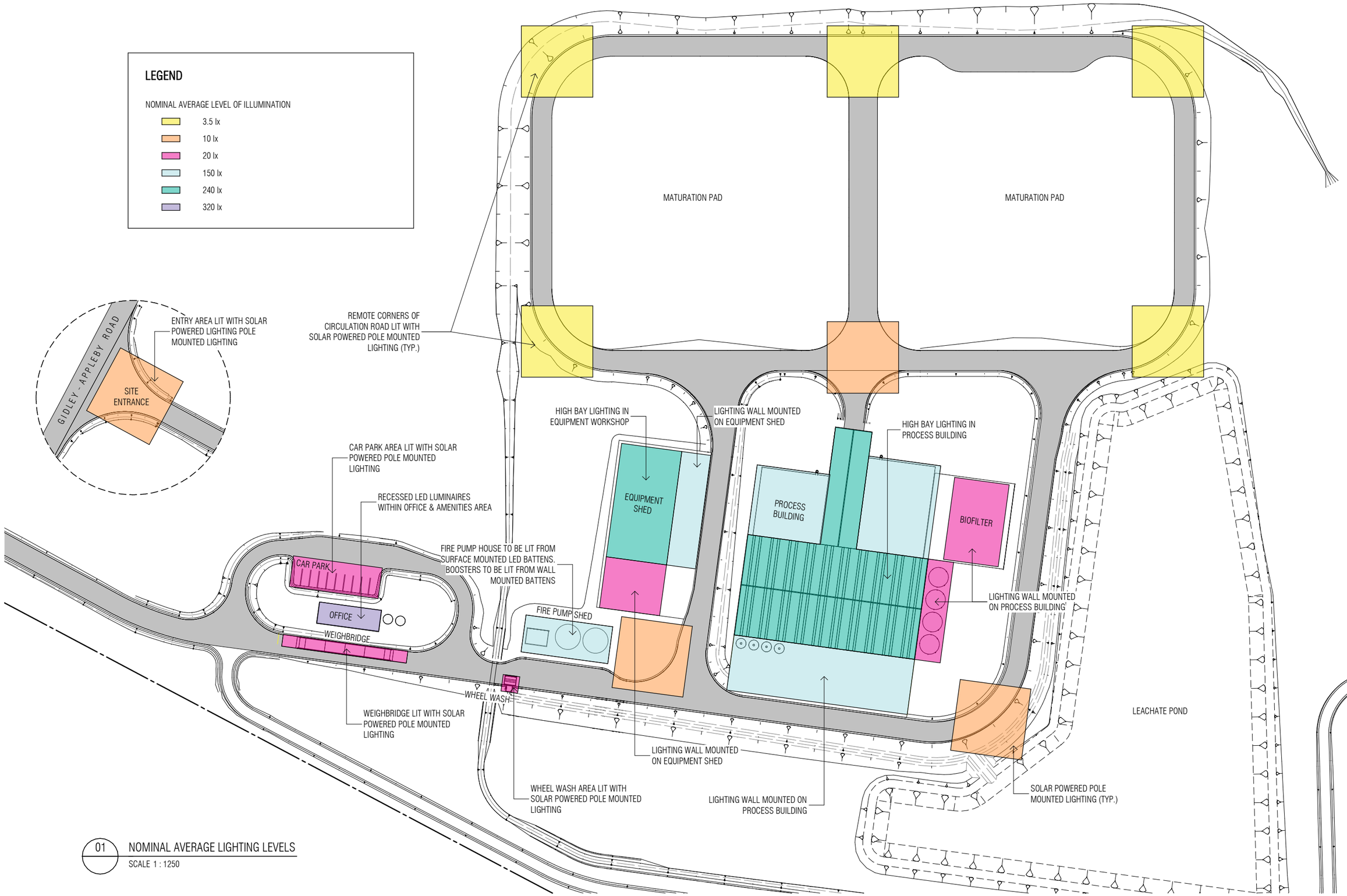
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA004**	P2

Status
PRELIMINARY



01 NOMINAL AVERAGE LIGHTING LEVELS
SCALE 1 : 1250

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
NOMINAL AVERAGE LIGHTING LEVELS

Date created 02-09-19 | Checked LE | Approved -
Scale
As indicated @ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
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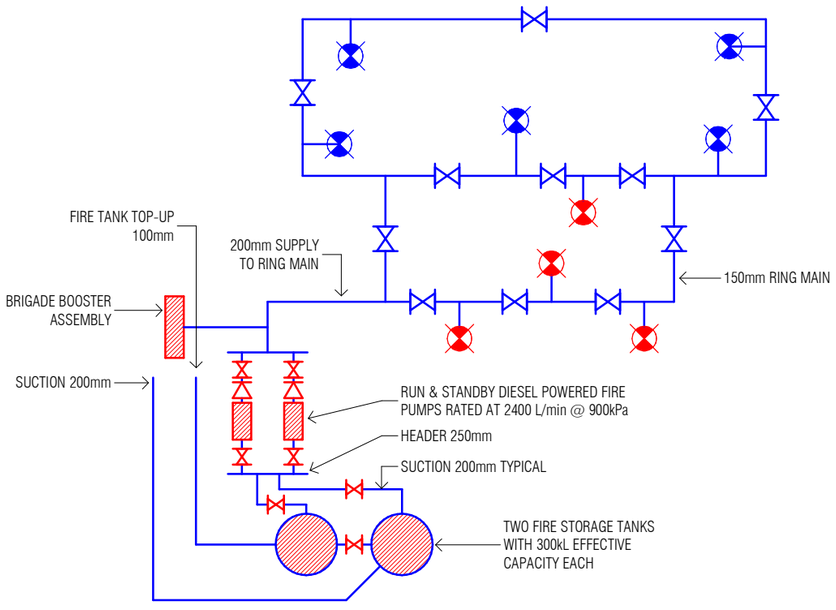
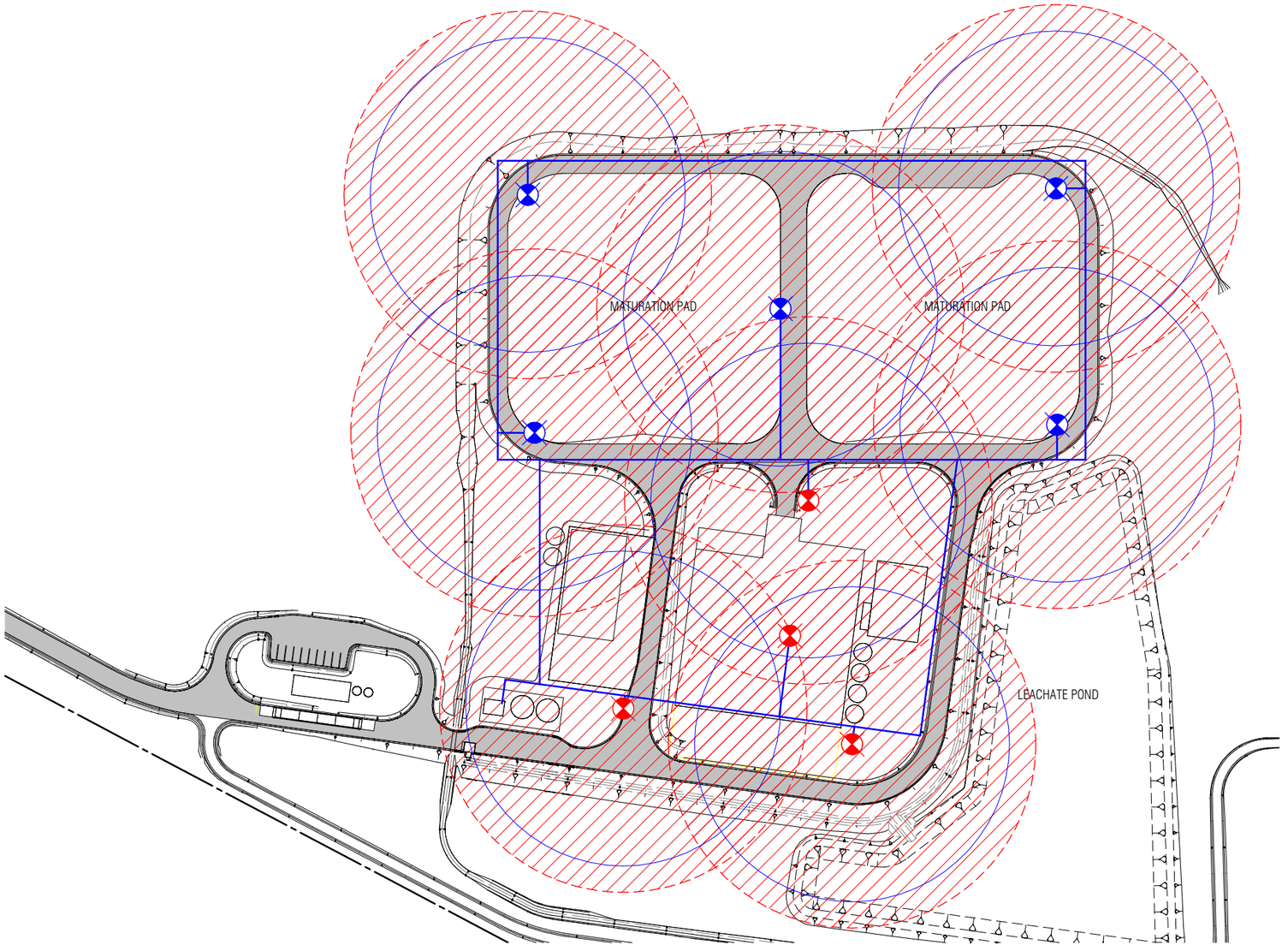
Project number 19013 | Drawing number **DA005** | Revision P2
Status
PRELIMINARY

LEGEND

- HYDRANT STAND PIPE
- HYDRANT, BALL TYPE UNDERGROUND
- ISOLATION VALVE
- AREA OF COVERAGE OF HYDRANT
  TOTAL COVERAGE RADIUS 60m +
  10m WATER SPRAY



SCHEMATIC ARRANGEMENT OF FIRE HYDRANT SERVICE



01 FIRE PROTECTION SITE HYDRANT LAYOUT
SCALE 1 : 2000

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
FIRE PROTECTION SITE HYDRANT LAYOUT

Date created	Checked	Approved
02-09-19	LE	-

Scale
As indicated @ A3

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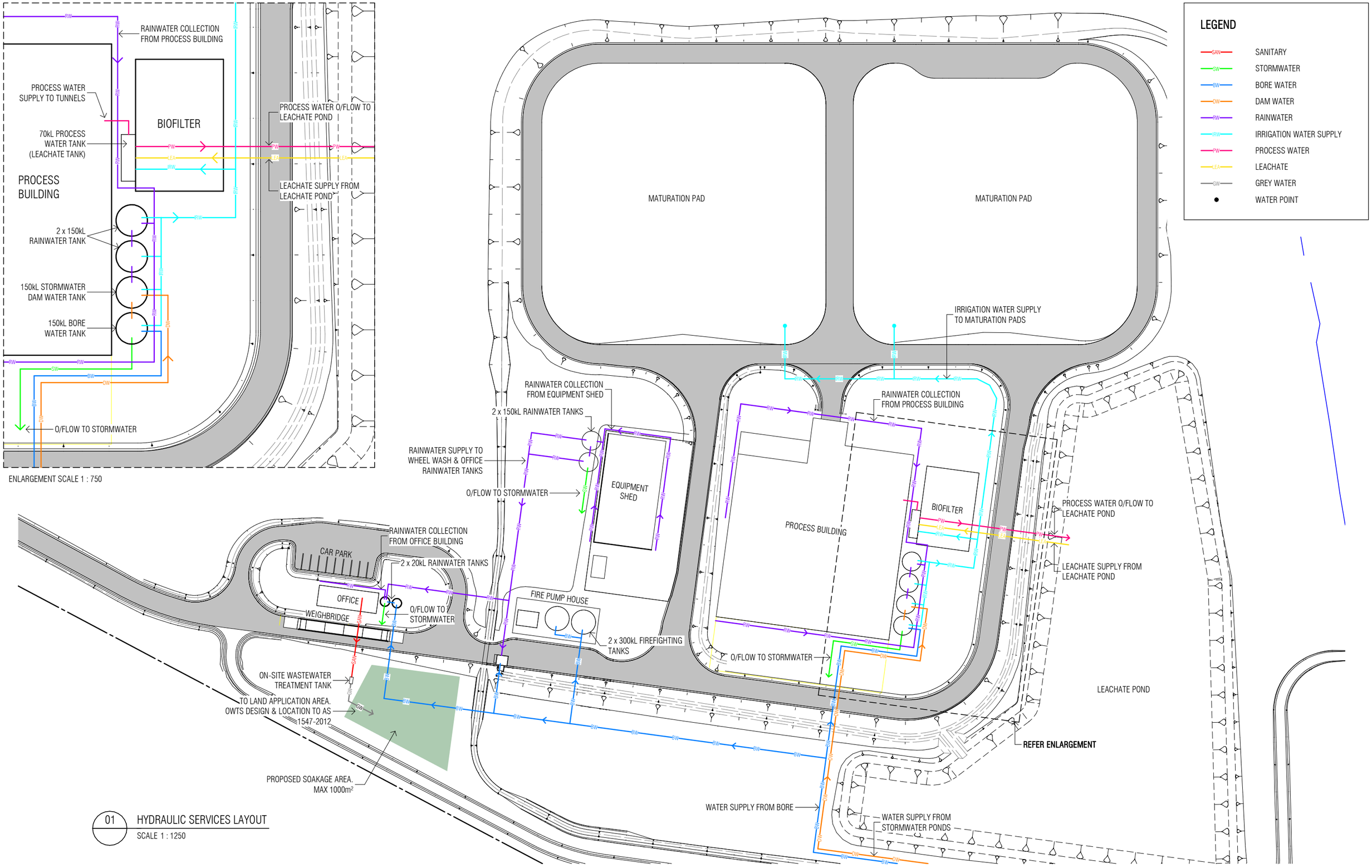
Project number 19013
Drawing number **DA006**
Revision P2
Status PRELIMINARY

ENLARGEMENT SCALE 1 : 750



01 HYDRAULIC SERVICES LAYOUT

SCALE 1 : 1250

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1400
LAUNCESTON, TAS, 7250

Drawing title
HYDRAULIC SERVICES LAYOUT

Date created	Checked	Approved
02-09-19	LE	-

Scale
As indicated @ A3

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Project number	Drawing number	Revision
19013	**DA007**	P2

Status
PRELIMINARY

LEGEND

A — SHRUB SPECIES GROUP A:
ACACIA DEANEI SUBSP. DEANI (DEANE'S WATTLE)
ACACIA IMPLEXA (HICKORY WATTLE)
ACACIA NERIFOLIA (SILVER WATTLE)
BURSARIA SPINOSA (NATIVE BLACKTHORN)
CALLITRIS GLAUCOPHYLLA (WHITE CYPRESS PINE)
NOTELEA MICROCARPA (NATIVE OLIVE)

B — TREE SPECIES GROUP B: MIN. HEIGHT 2.0m
BRACHYCHITON POPULNEUS (KURRAJONG)

C — TREE SPECIES GROUP C: MIN. HEIGHT 3.0m
ANGOPHORA FLORIBUNDA (ROUGH BARKED APPLE)

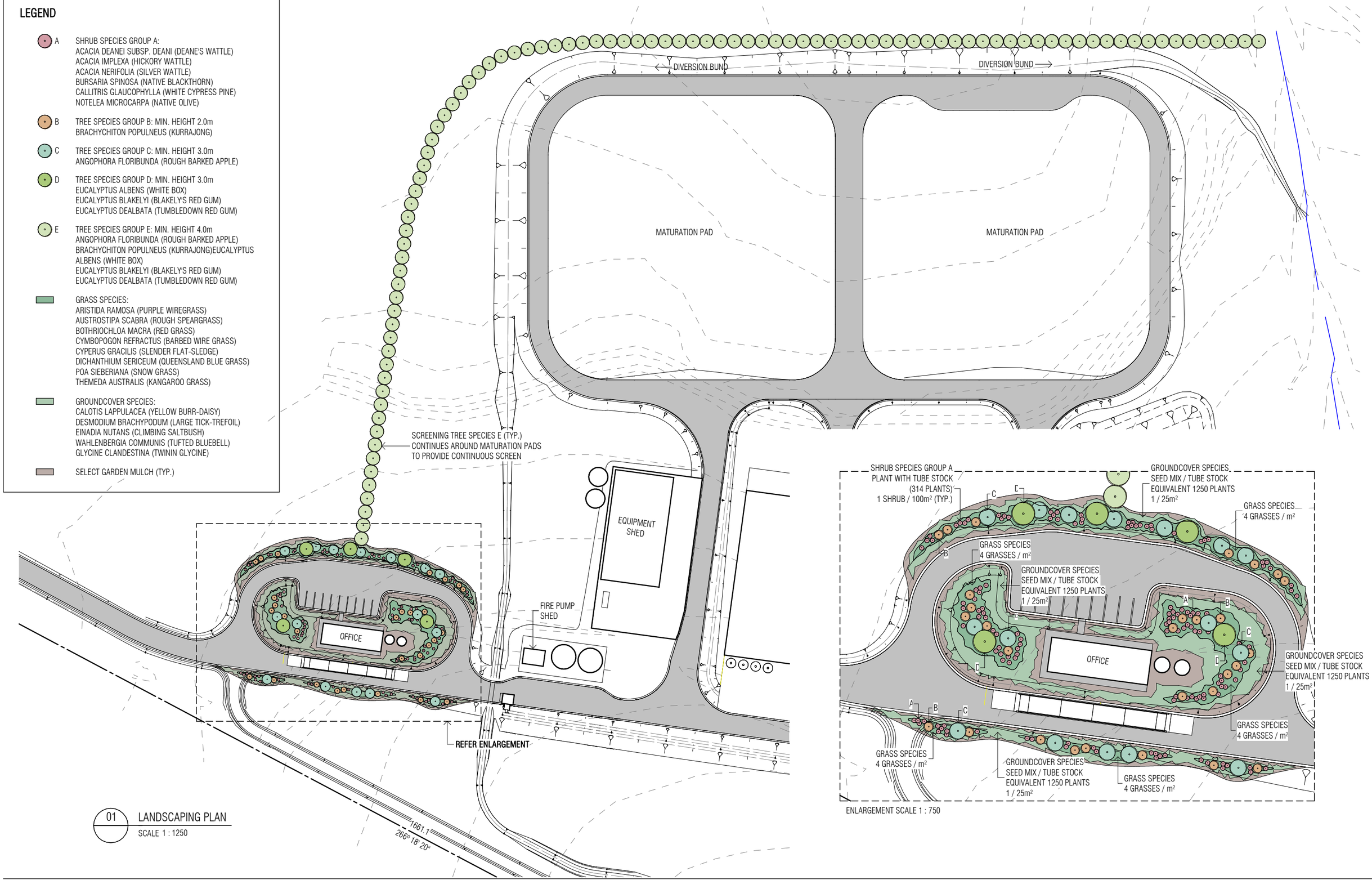
D — TREE SPECIES GROUP D: MIN. HEIGHT 3.0m
EUCALYPTUS ALBENS (WHITE BOX)
EUCALYPTUS BLAKELYI (BLAKELY'S RED GUM)
EUCALYPTUS DEALBATA (TUMBLEDOWN RED GUM)

E — TREE SPECIES GROUP E: MIN. HEIGHT 4.0m
ANGOPHORA FLORIBUNDA (ROUGH BARKED APPLE)
BRACHYCHITON POPULNEUS (KURRAJONG)EUCALYPTUS
ALBENS (WHITE BOX)
EUCALYPTUS BLAKELYI (BLAKELY'S RED GUM)
EUCALYPTUS DEALBATA (TUMBLEDOWN RED GUM)

GRASS SPECIES:
ARISTIDA RAMOSA (PURPLE WIREGRASS)
AUSTROSTIPA SCABRA (ROUGH SPEARGRASS)
BOTHRIOCHLOA MACRA (RED GRASS)
CYMBOPOGON REFRACTUS (BARBED WIRE GRASS)
CYPERUS GRACILIS (SLENDER FLAT-SLEDGE)
DICHANTHIUM SERICEUM (QUEENSLAND BLUE GRASS)
POA SIEBERIANA (SNOW GRASS)
THEMEDA AUSTRALIS (KANGAROO GRASS)

GROUNDCOVER SPECIES:
CALOTIS LAPPULACEA (YELLOW BURR-DAISY)
DESMODIUM BRACHYPODUM (LARGE TICK-TREFOIL)
EINADIA NUTANS (CLIMBING SALTBUSH)
WAHLENBERGIA COMMUNIS (TUFTED BLUEBELL)
GLYCINE CLANDESTINA (TWININ GLYCINE)

SELECT GARDEN MULCH (TYP.)



01 LANDSCAPING PLAN
SCALE 1 : 1250

ENLARGEMENT SCALE 1 : 750

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
LANDSCAPING PLAN

Date created 02-09-19 | Checked LE | Approved -
Scale
As indicated @ A3

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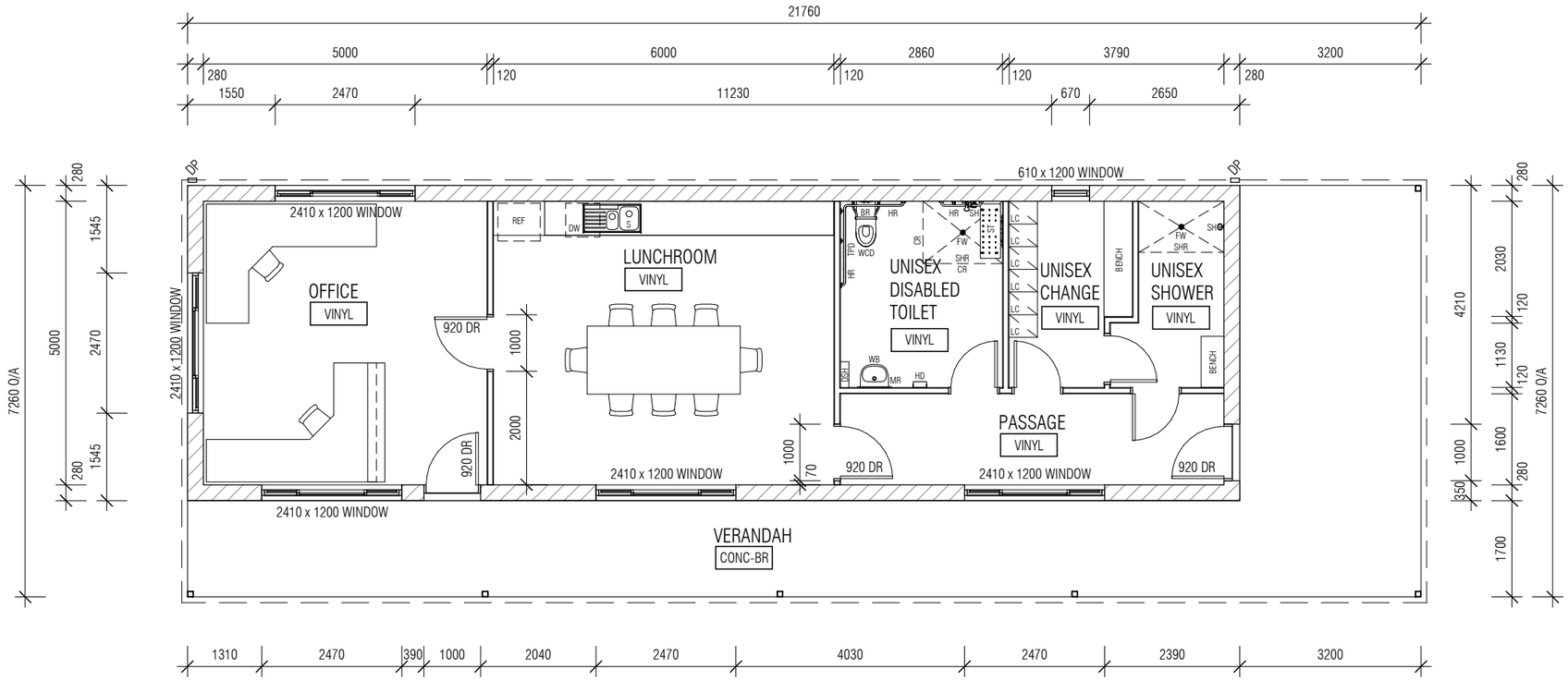
Project number 19013 | Drawing number **DA008** | Revision P2
Status
PRELIMINARY



01 FLOOR PLAN

SCALE 1 : 100

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
OFFICE - PROPOSED FLOOR PLAN

Date created	Checked	Approved
20/08/19	LE	-

Scale
1 : 100 @ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
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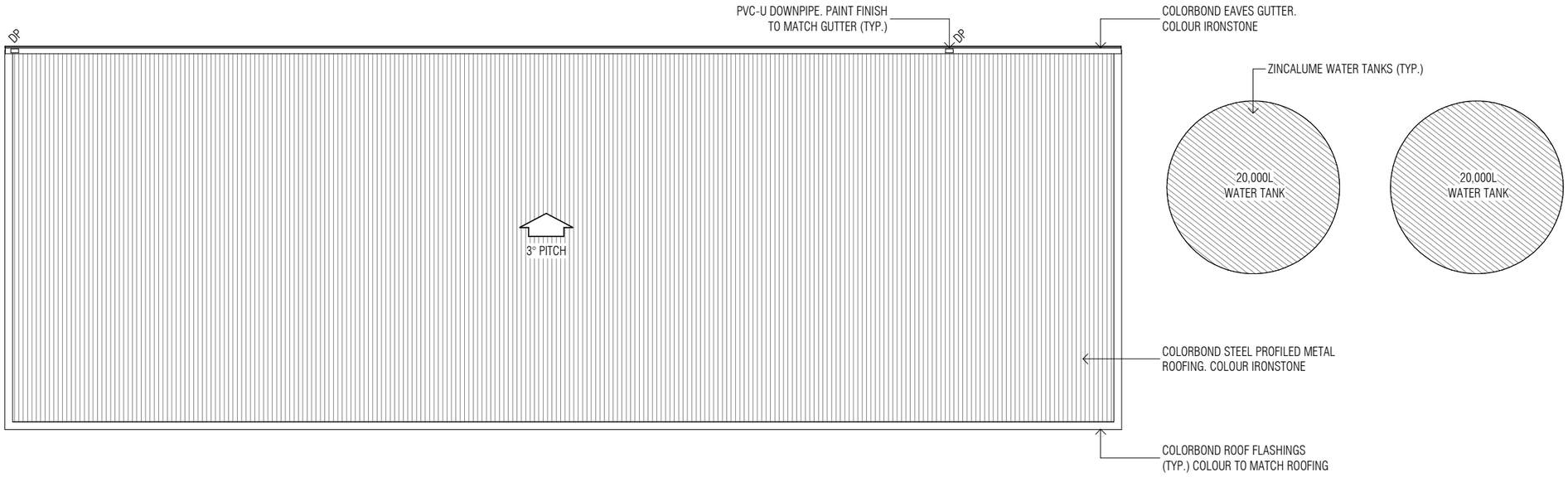
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA101**	P2

Status
PRELIMINARY



01 ROOF PLAN
SCALE 1 : 100

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
OFFICE - ROOF PLAN

Date created	Checked	Approved
20/08/19	LE	-

Scale
1 : 100 @ A3

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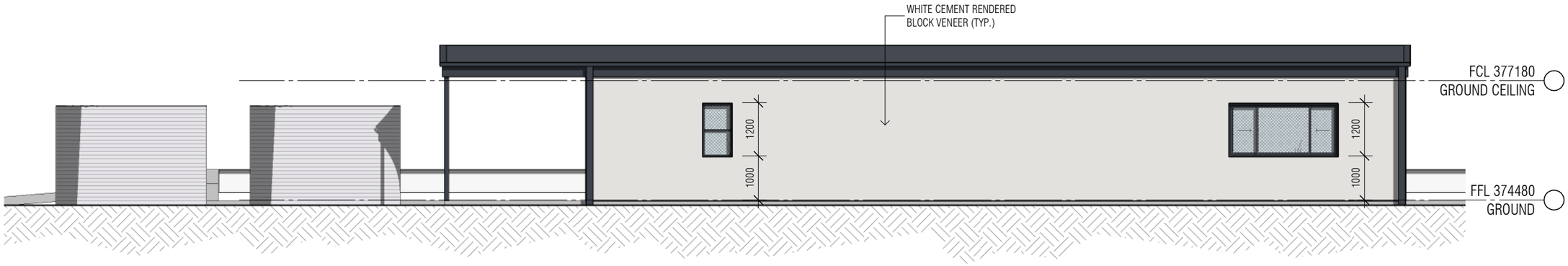
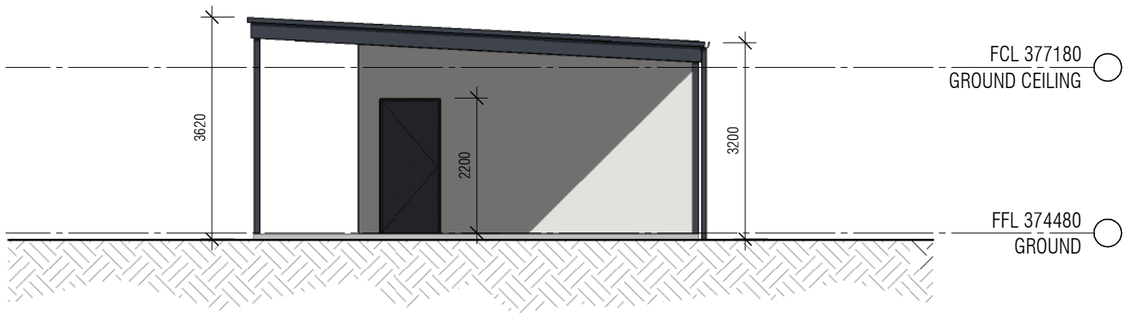
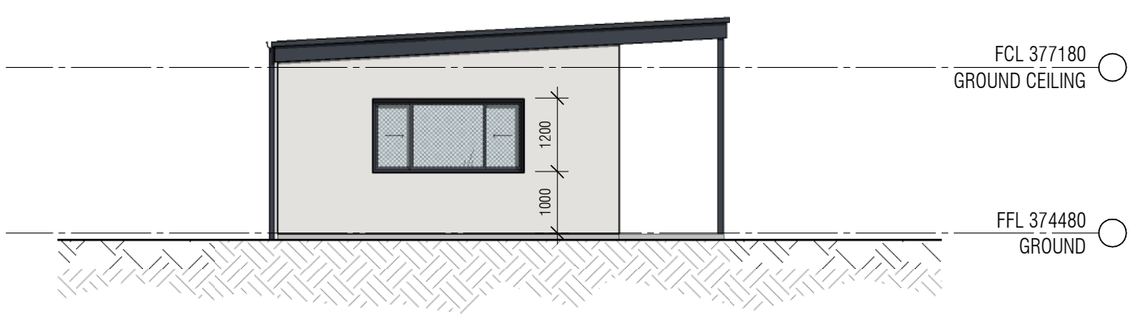
Project number	Drawing number	Revision
19013	**DA102**	P2

Status
PRELIMINARY



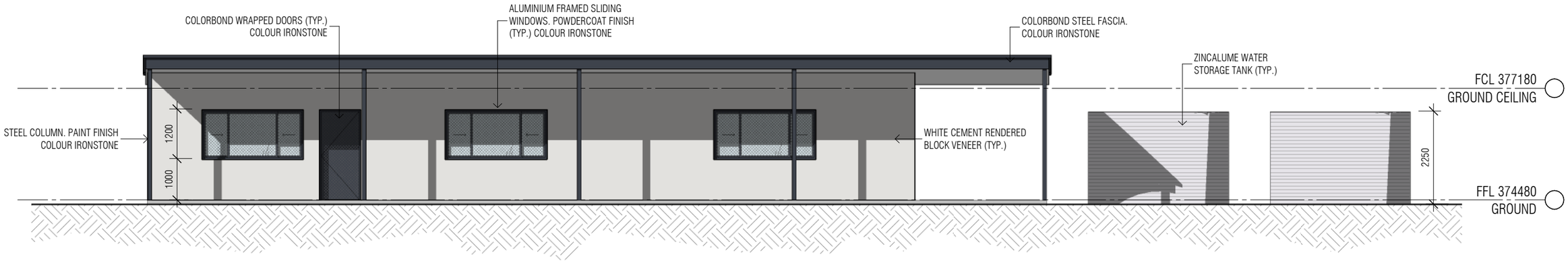
01 NORTH ELEVATION
SCALE 1 : 100





02 EAST ELEVATION
SCALE 1 : 100

03 WEST ELEVATION
SCALE 1 : 100



04 SOUTH ELEVATION
SCALE 1 : 100

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
OFFICE - ELEVATIONS

Date created	Checked	Approved
20/08/19	LE	-

Scale
1 : 100 @ A3

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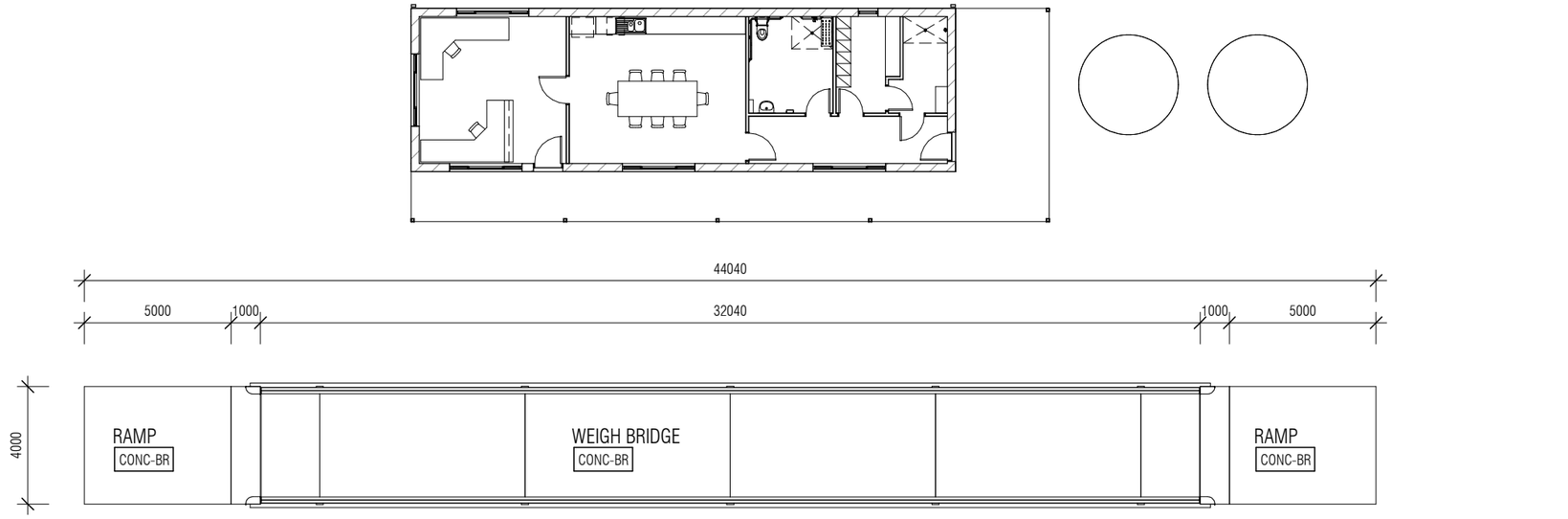
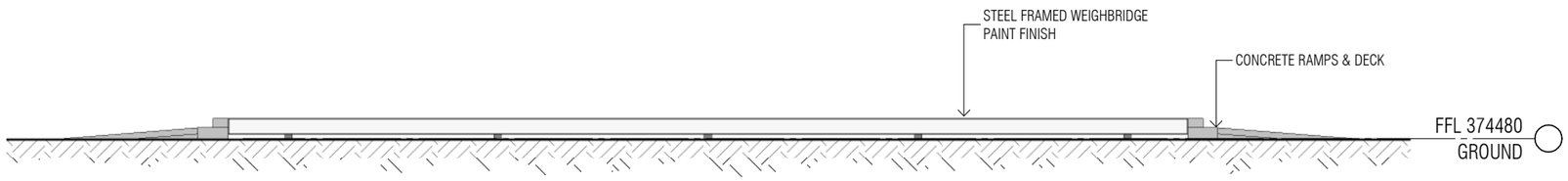
Project number	Drawing number	Revision
19013	**DA103**	P2

Status
PRELIMINARY



01 WEIGHBRIDGE PLAN
SCALE 1 : 200



02 NORTH ELEVATION
SCALE 1 : 200

Notes
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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
WEIGHBRIDGE PLAN

Date created	Checked	Approved
26/08/19	LE	-

Scale
1 : 200 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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Project number	Drawing number	Revision
19013	**DA105**	P2

Status
PRELIMINARY

01 3D PERSPECTIVE VIEW

02 3D PERSPECTIVE VIEW

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
OFFICE - 3D PERSPECTIVES

Date created	Checked	Approved
20/08/19	LE	-

Scale
@ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
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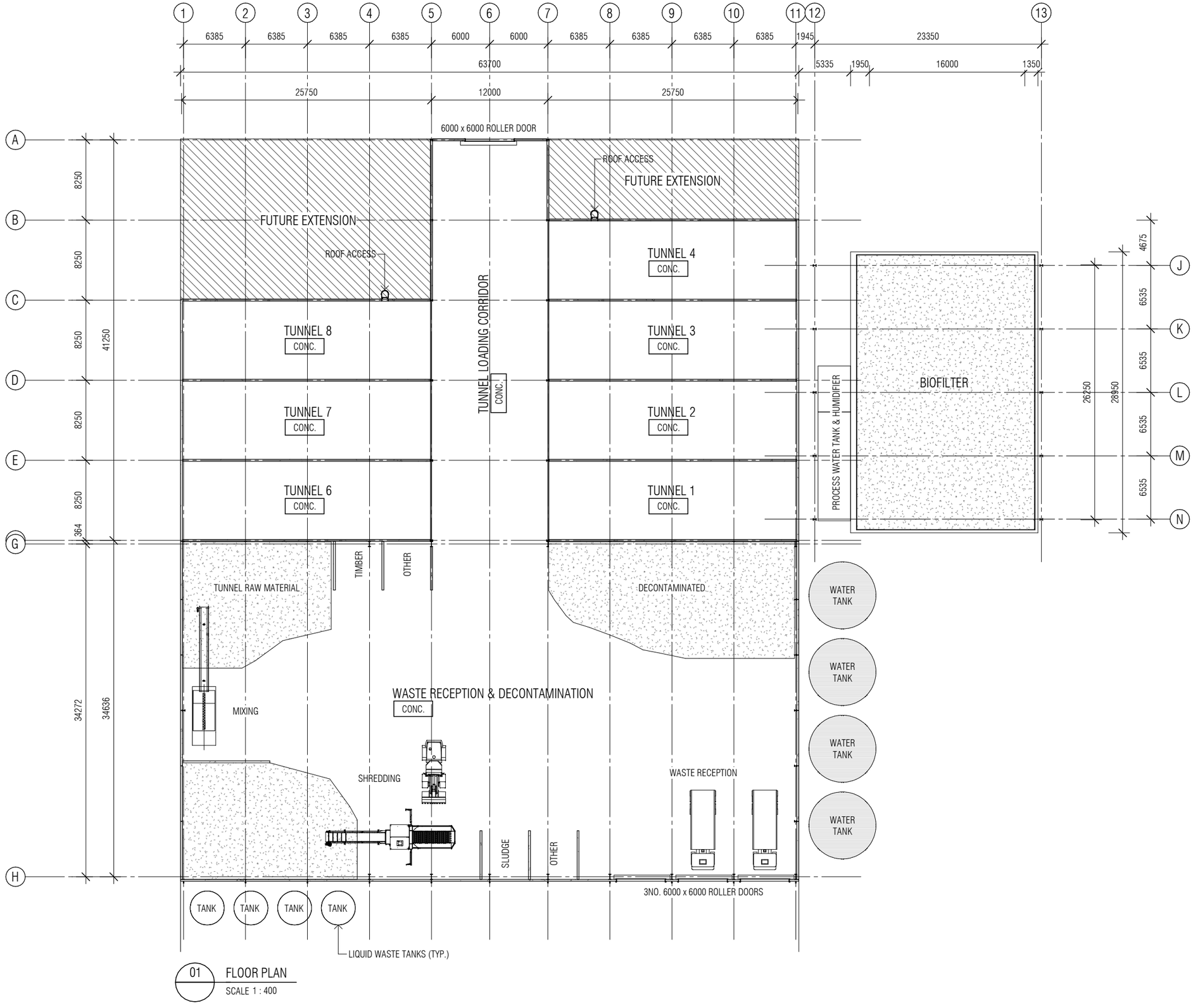
Project number	Drawing number	Revision
19013	**DA104**	P2

Status
PRELIMINARY



01 FLOOR PLAN
SCALE 1 : 400

Edwards + Simpson

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
COMPOST FACILITY & BIOFILTER - FLOOR PLAN

Date created	Checked	Approved
27/09/19	MS	-

Scale
1 : 400 @ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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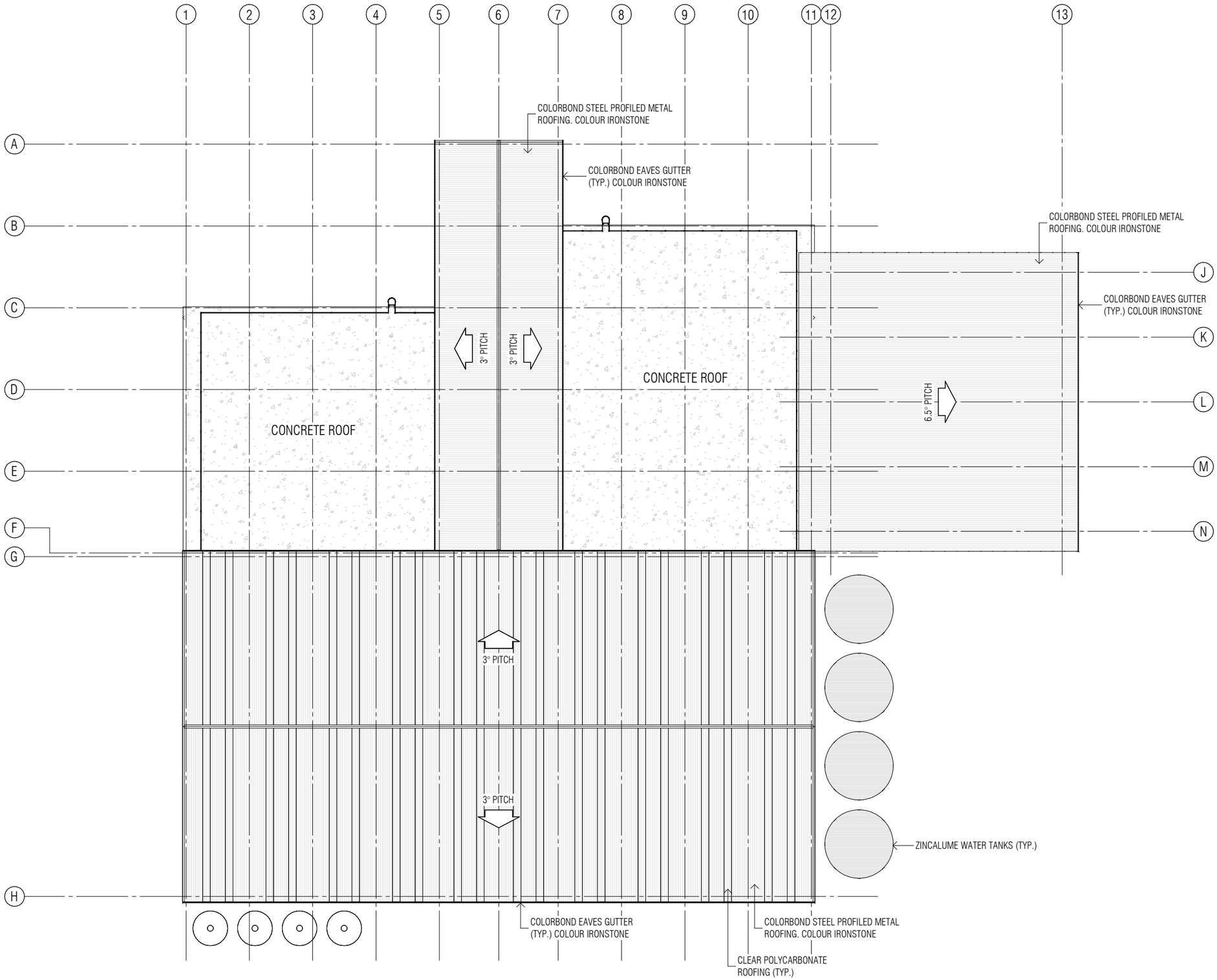
Project number	Drawing number	Revision
19013	**DA201**	P2

Status
PRELIMINARY



01 ROOF PLAN
SCALE 1 : 400

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
COMPOST FACILITY & BIOFILTER - ROOF PLAN

Date created 27/08/19 | Checked MS | Approved -
Scale 1 : 400 @ A3

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ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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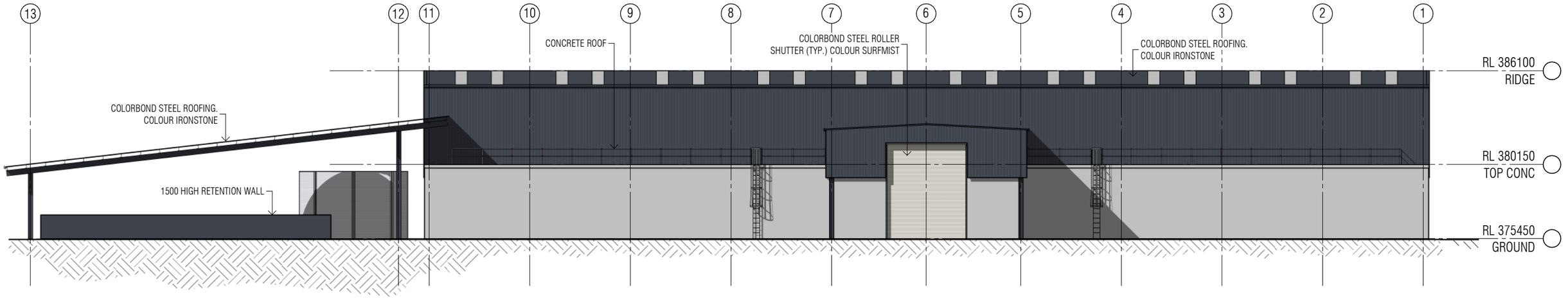
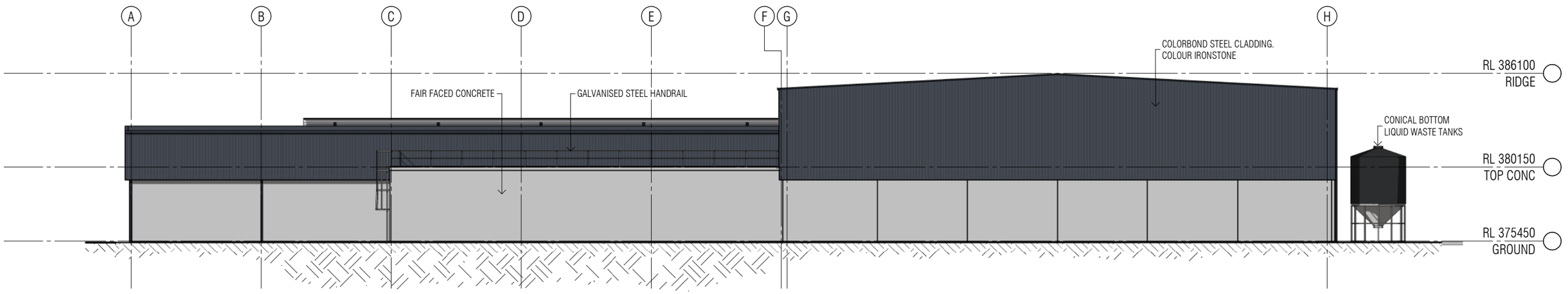
Project number 19013 | Drawing number **DA202** | Revision P2
Status PRELIMINARY



01 NORTH ELEVATION

SCALE 1 : 250



02 WEST ELEVATION

SCALE 1 : 250

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P3	20/09/19	DEVELOPMENT APPLICATION	MS
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
COMPOST FACILITY & BIOFILTER - ELEVATIONS 1

Date created	Checked	Approved
27/08/19	MS	-

Scale
1 : 250 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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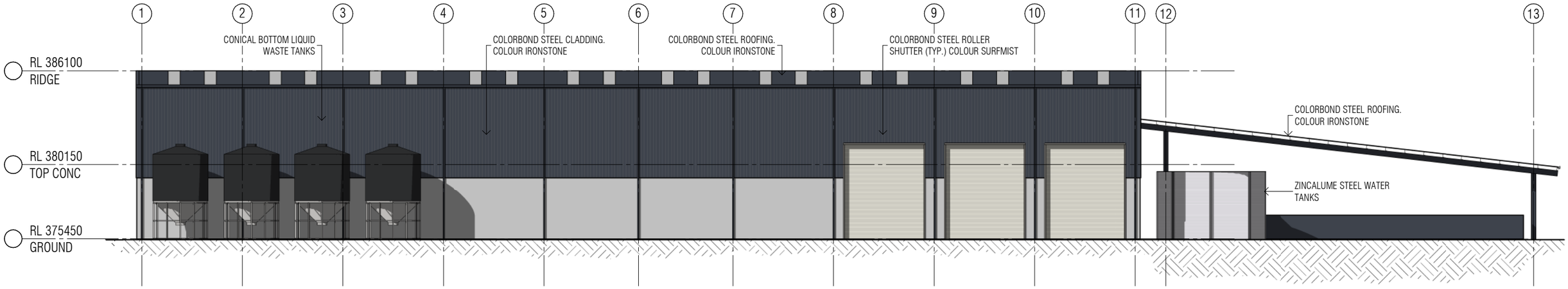
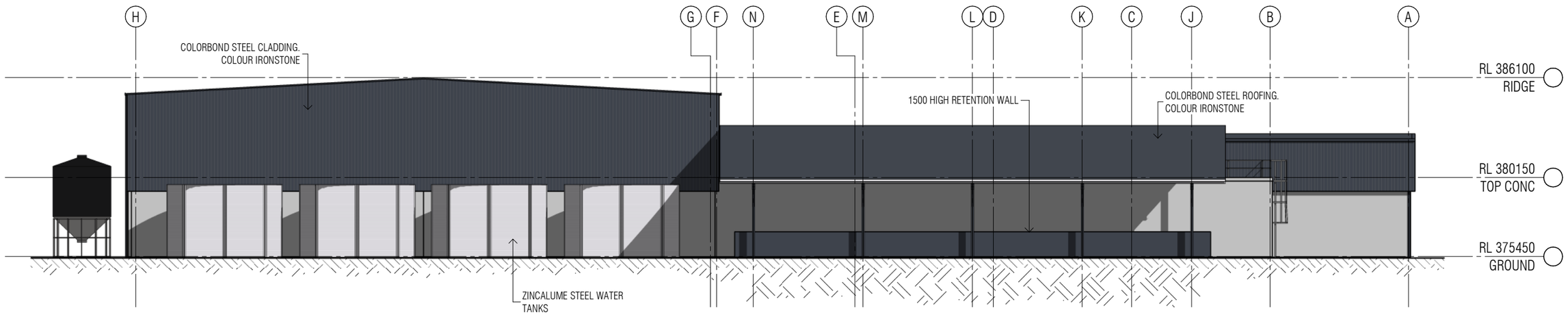
Project number	Drawing number	Revision
19013	**DA203**	P3

Status
PRELIMINARY



01 SOUTH ELEVATION

SCALE 1 : 250



02 EAST ELEVATION

SCALE 1 : 250

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P3	20/09/19	DEVELOPMENT APPLICATION	MS
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
COMPOST FACILITY & BIOFILTER - ELEVATIONS 2

Date created 22/08/19
Checked MS
Approved -
Scale 1 : 250 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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Project number 19013
Drawing number **DA204**
Revision P3
Status PRELIMINARY

01 3D PERSPECTIVE VIEW

02 3D PERSPECTIVE VIEW

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
COMPOST FACILITY & BIOFILTER - 3D PERSPECTIVES

Date created	Checked	Approved
28/08/19	MS	-

Scale
@ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
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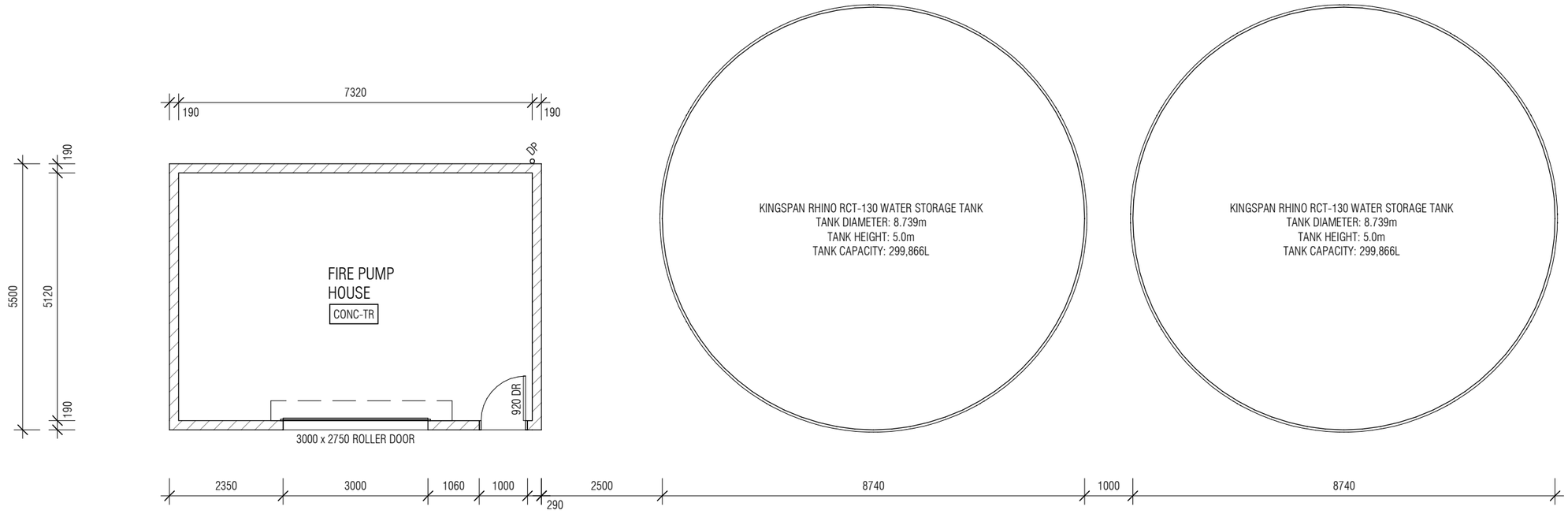
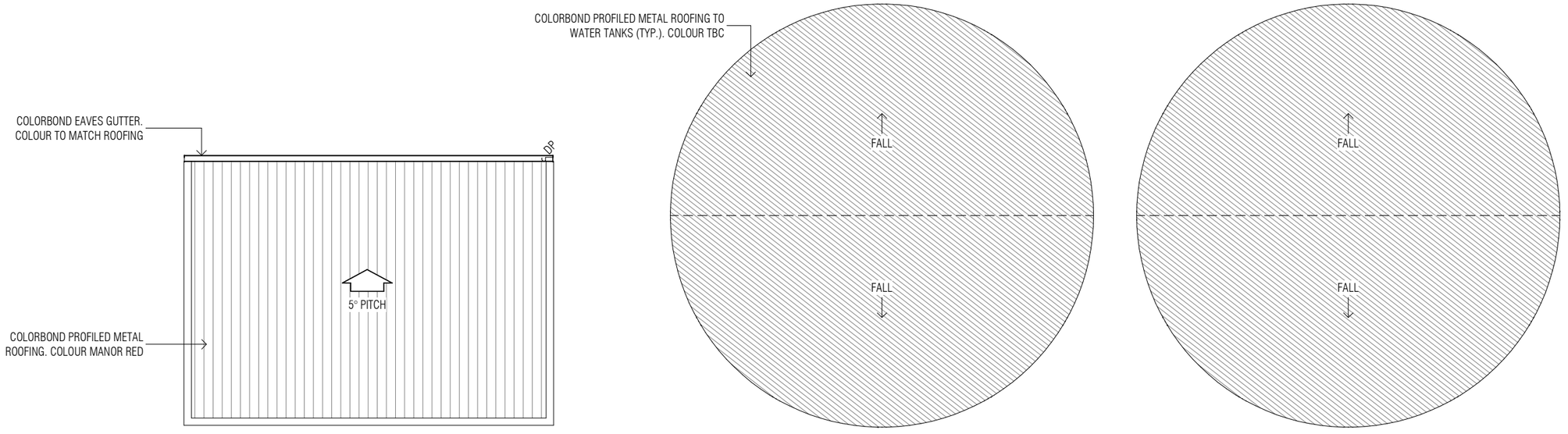
Project number	Drawing number	Revision
19013	**DA205**	P2

Status
PRELIMINARY



01 FLOOR PLAN
SCALE 1 : 100



02 ROOF PLAN
SCALE 1 : 100

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
TAMWORTH, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
FIRE PUMP HOUSE - FLOOR PLAN & ROOF PLAN

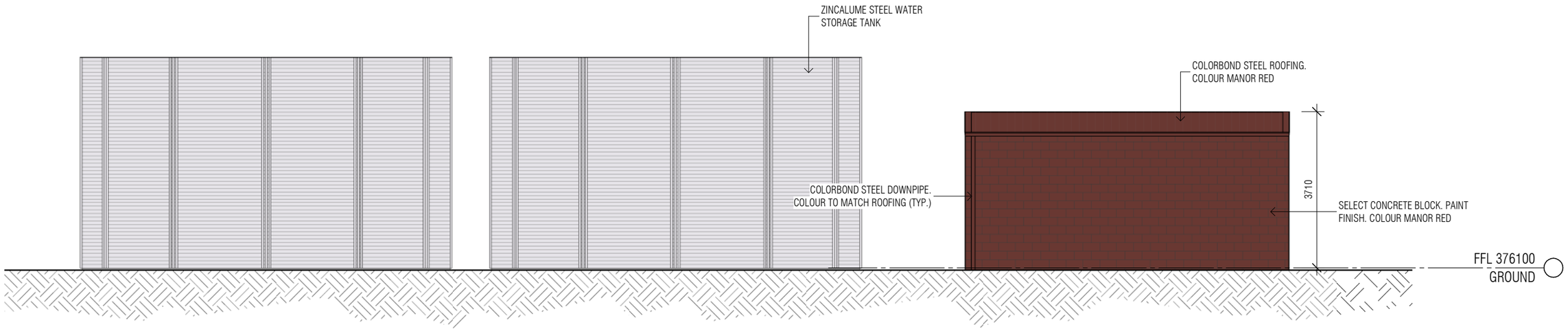
Date created	Checked	Approved
21/08/19	LE	-

Scale
1 : 100 @ A3

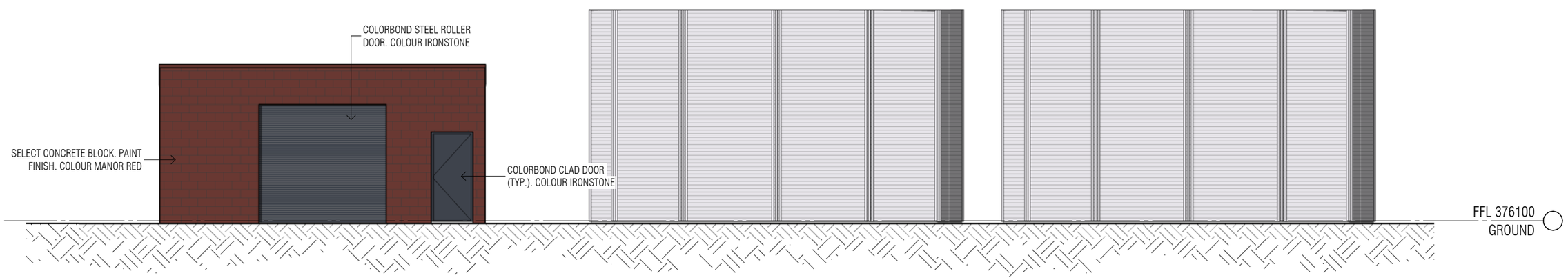
Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA701**	P1

Status
PRELIMINARY



01 NORTH ELEVATION
SCALE 1 : 100



02 SOUTH ELEVATION
SCALE 1 : 100

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
TAMWORTH, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
FIRE PUMP HOUSE - ELEVATIONS 1

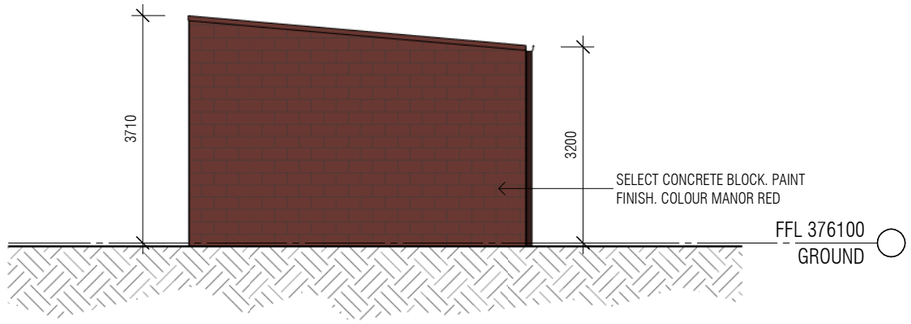
Date created 21/08/19 | Checked LE | Approved -

Scale
1 : 100 @ A3

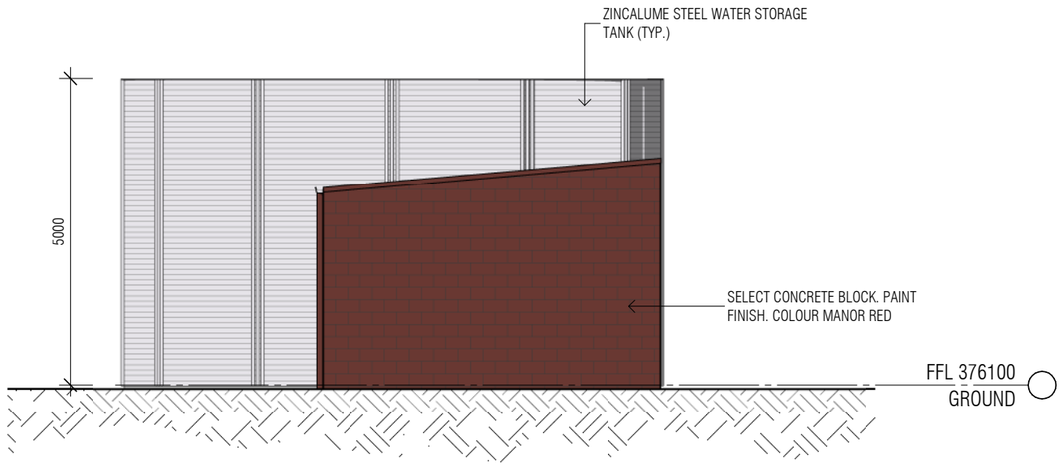
Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number 19013 | Drawing number **DA702** | Revision P1

Status
PRELIMINARY



01 EAST ELEVATION
SCALE 1 : 100



02 WEST ELEVATION
SCALE 1 : 100

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
TAMWORTH, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

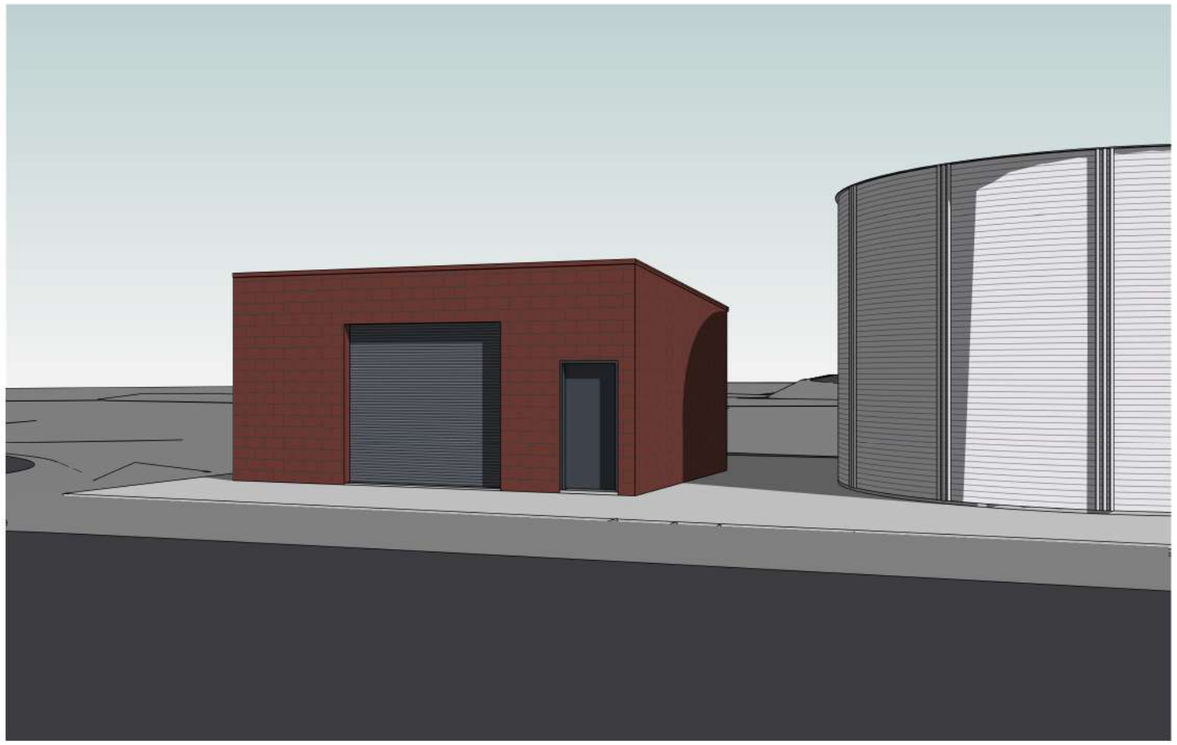
Drawing title
FIRE PUMP HOUSE - ELEVATIONS 2

Date created 21/08/19 | Checked LE | Approved -
Scale 1 : 100 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number 19013 | Drawing number **DA703** | Revision P1
Status PRELIMINARY

01 3D PERSPECTIVE VIEW



02 3D PERSPECTIVE VIEW

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
FIRE PUMP HOUSE - 3D PERSPECTIVES

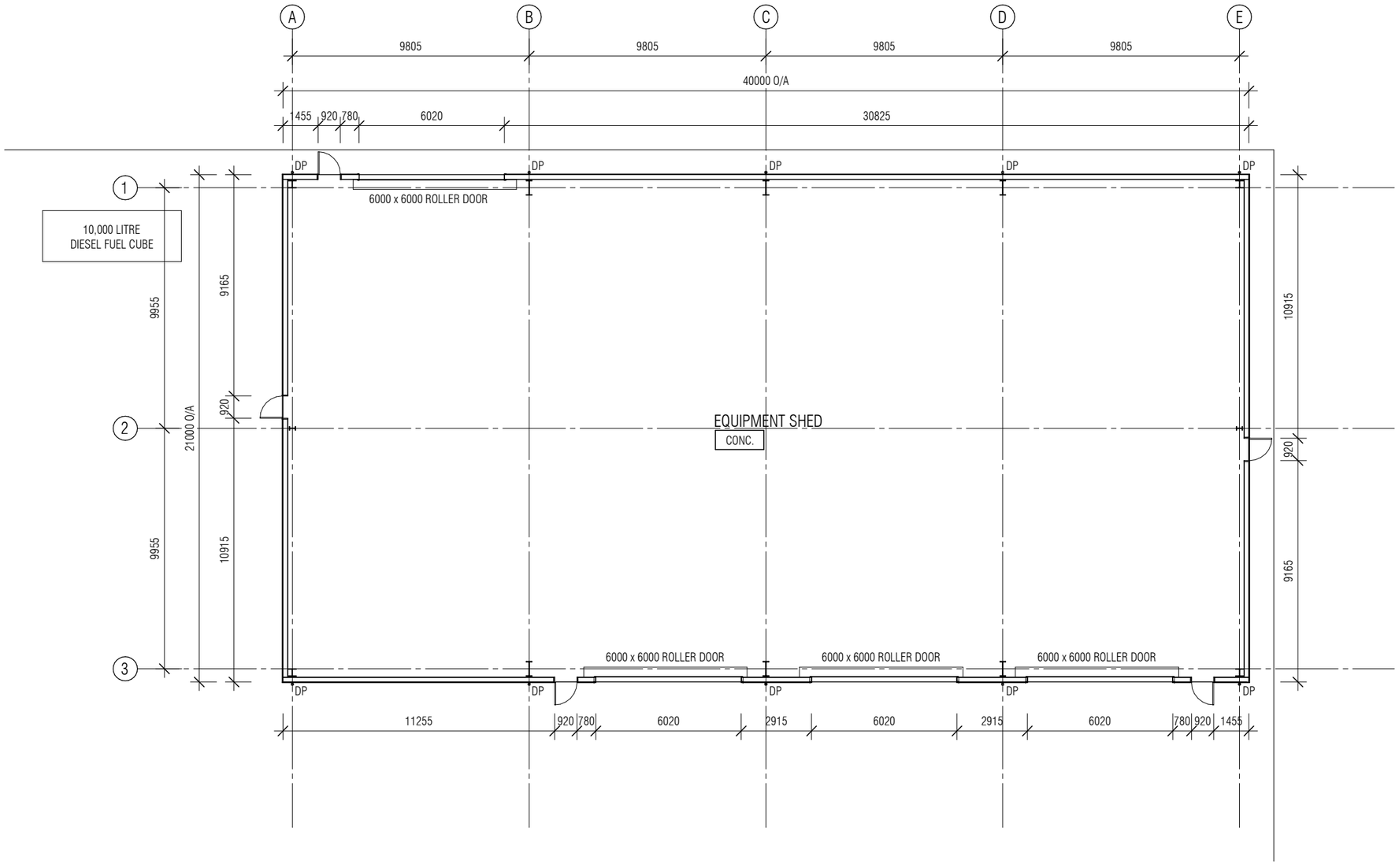
Date created	Checked	Approved
09/16/19	MS	-

Scale
1 : 100 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA806**	P2

Status
PRELIMINARY



01 FLOOR PLAN

SCALE 1 : 200

Edwards + Simpson

Notes
This drawing must be read in conjunction with all other drawings specifications, schedules and consultant documents. Any discrepancies must be reported to Edwards and Simpson. If in any doubt whatsoever contact Edwards and Simpson.

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

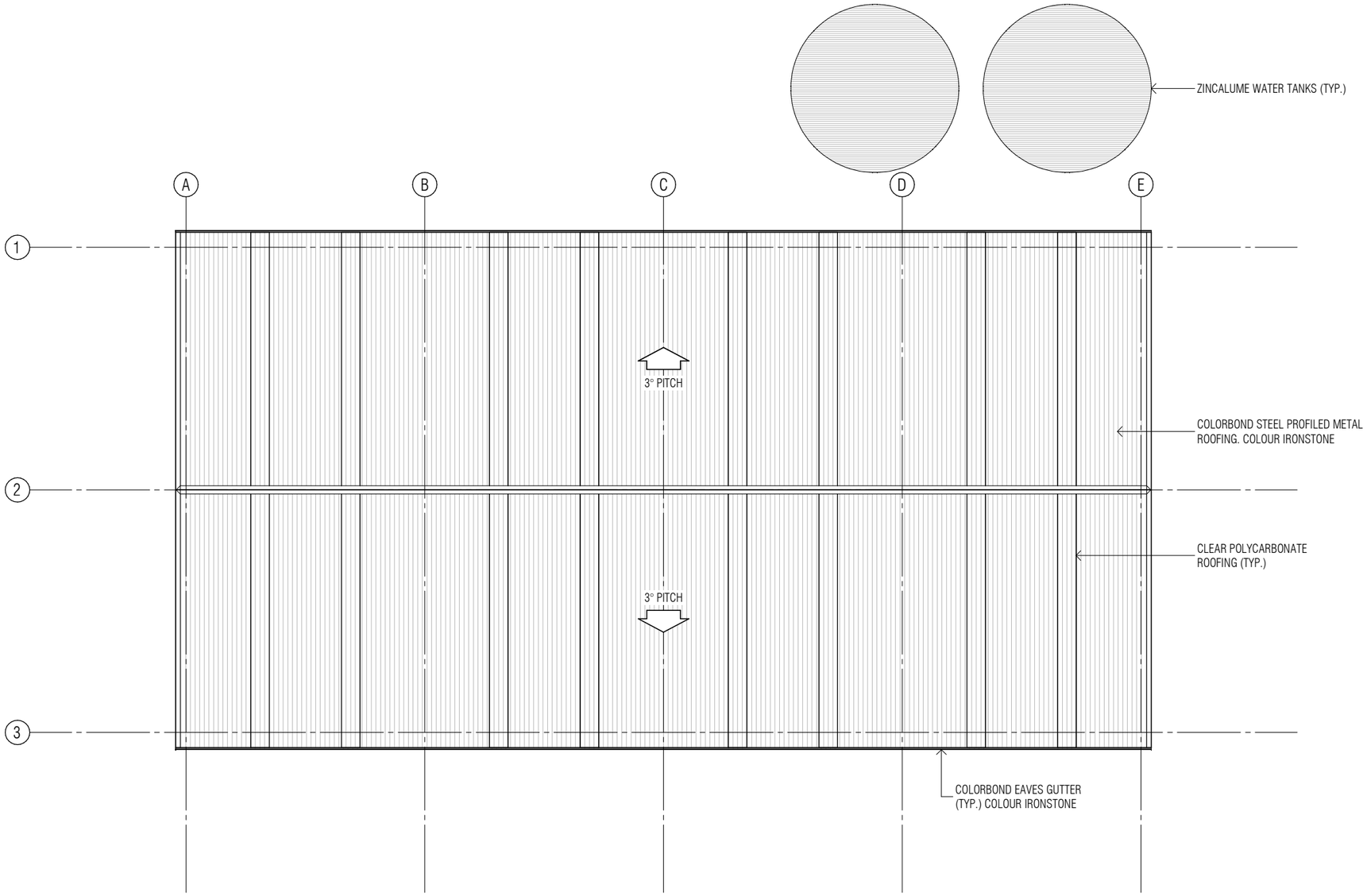
Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
EQUIPMENT SHED - FLOOR PLAN

Date created 02-09-19
Checked LE
Approved -
Scale 1 : 200 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number 19013
Drawing number **DA801**
Revision P2
Status PRELIMINARY



01 ROOF PLAN
SCALE 1 : 200

Edwards + Simpson

Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
EQUIPMENT SHED - ROOF PLAN

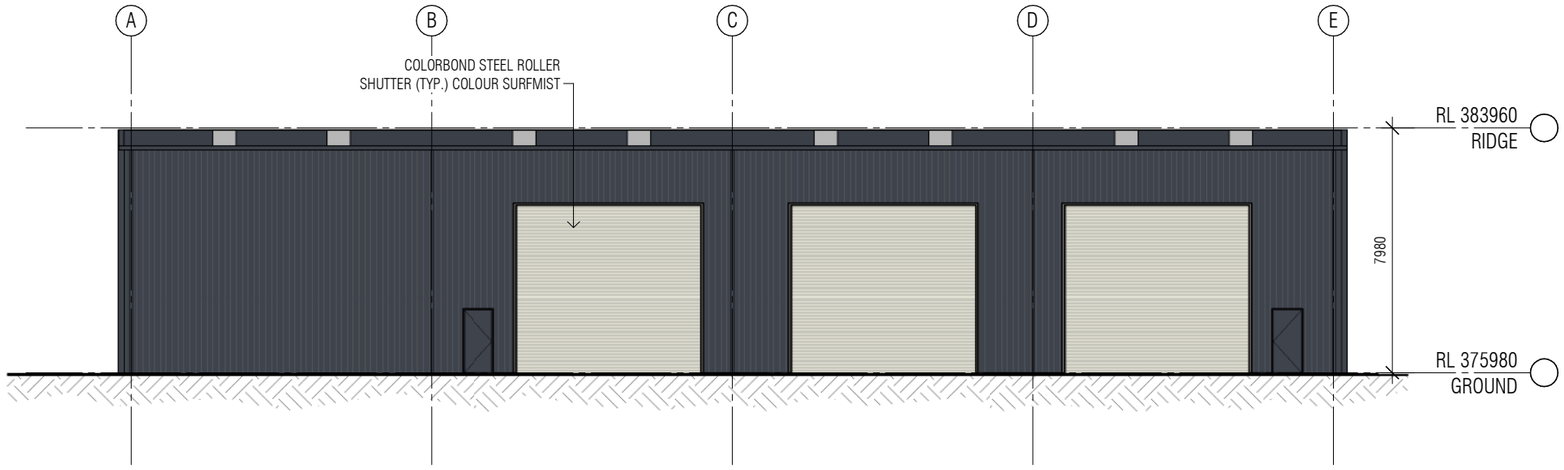
Date created	Checked	Approved
06-09-19	LE	-

Scale
1 : 200 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

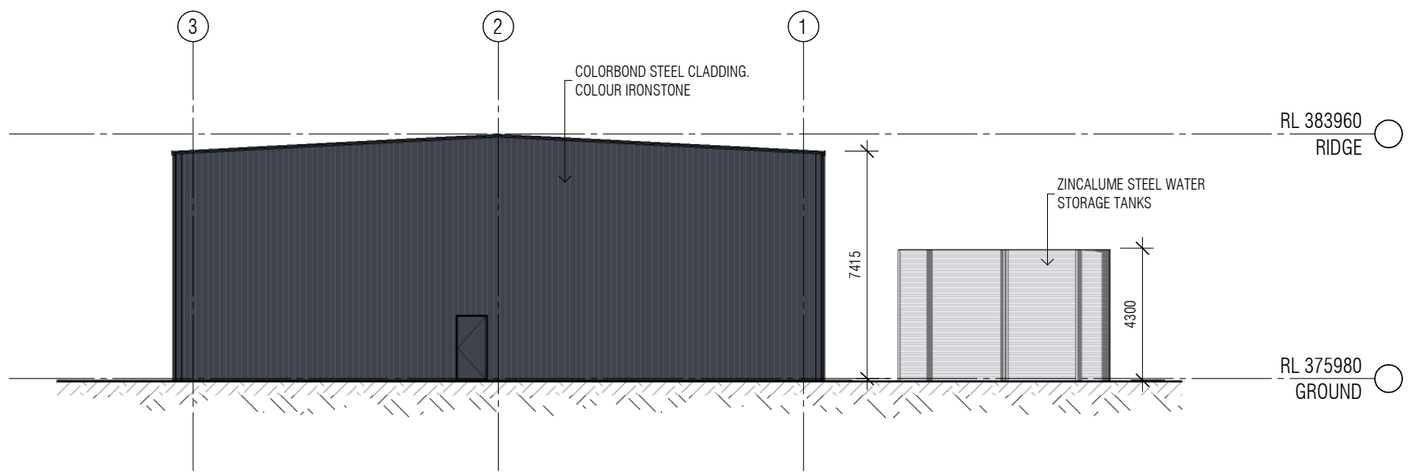
Project number	Drawing number	Revision
19013	**DA802**	P2

Status
PRELIMINARY



01 EAST ELEVATION

SCALE 1 : 200



02 NORTH ELEVATION

SCALE 1 : 200

Edwards + Simpson

Notes
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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
EQUIPMENT SHED - ELEVATIONS 1

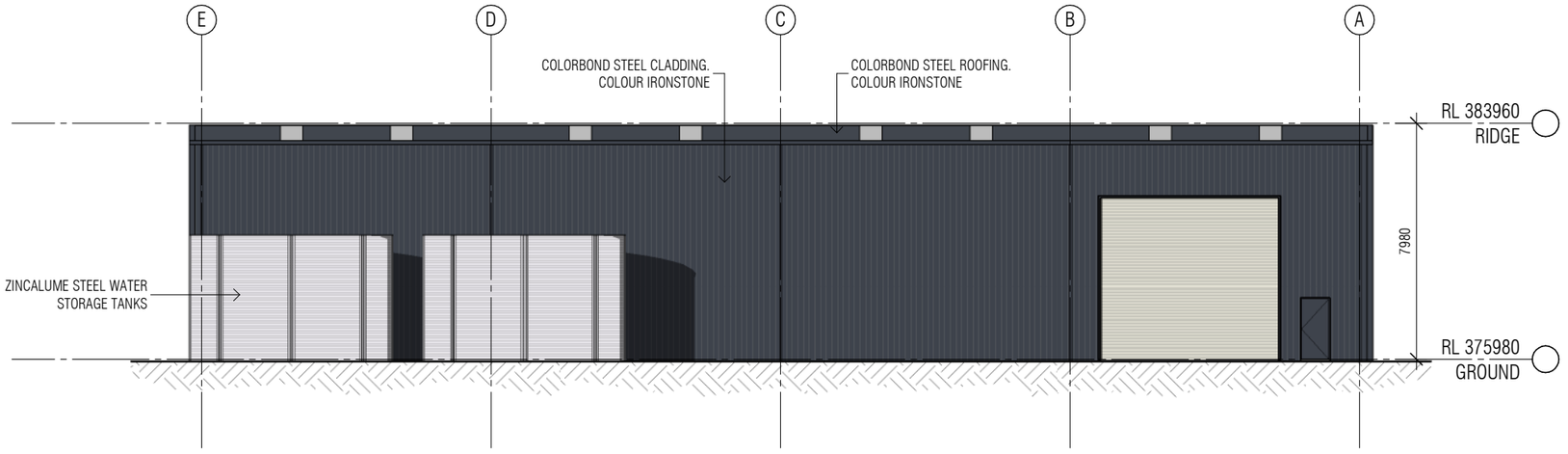
Date created	Checked	Approved
02-09-19	LE	-

Scale
1 : 200 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

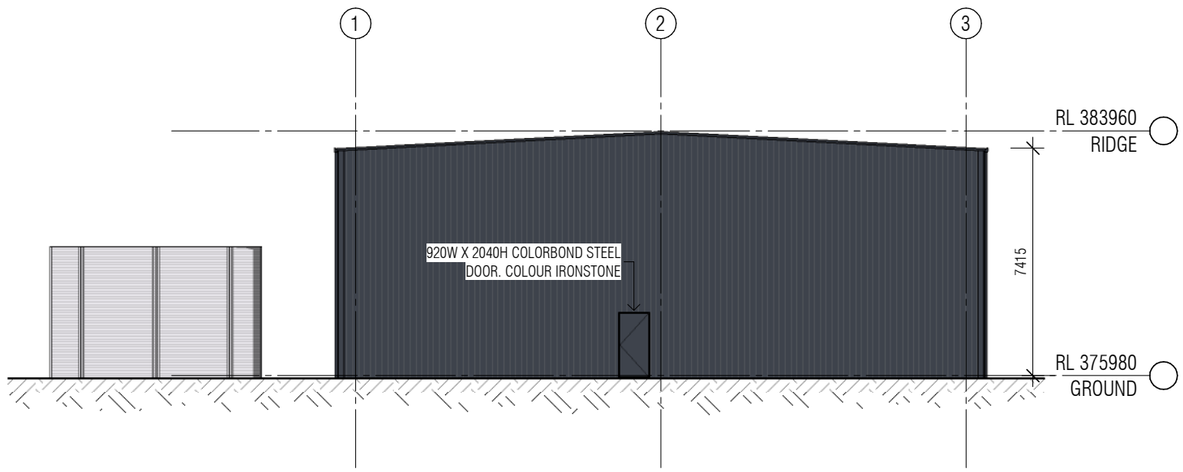
Project number	Drawing number	Revision
19013	**DA803**	P2

Status
PRELIMINARY



01 WEST ELEVATION

SCALE 1 : 200



02 SOUTH ELEVATION

SCALE 1 : 200

Edwards + Simpson

Notes
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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDELY APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
EQUIPMENT SHED - ELEVATIONS 2

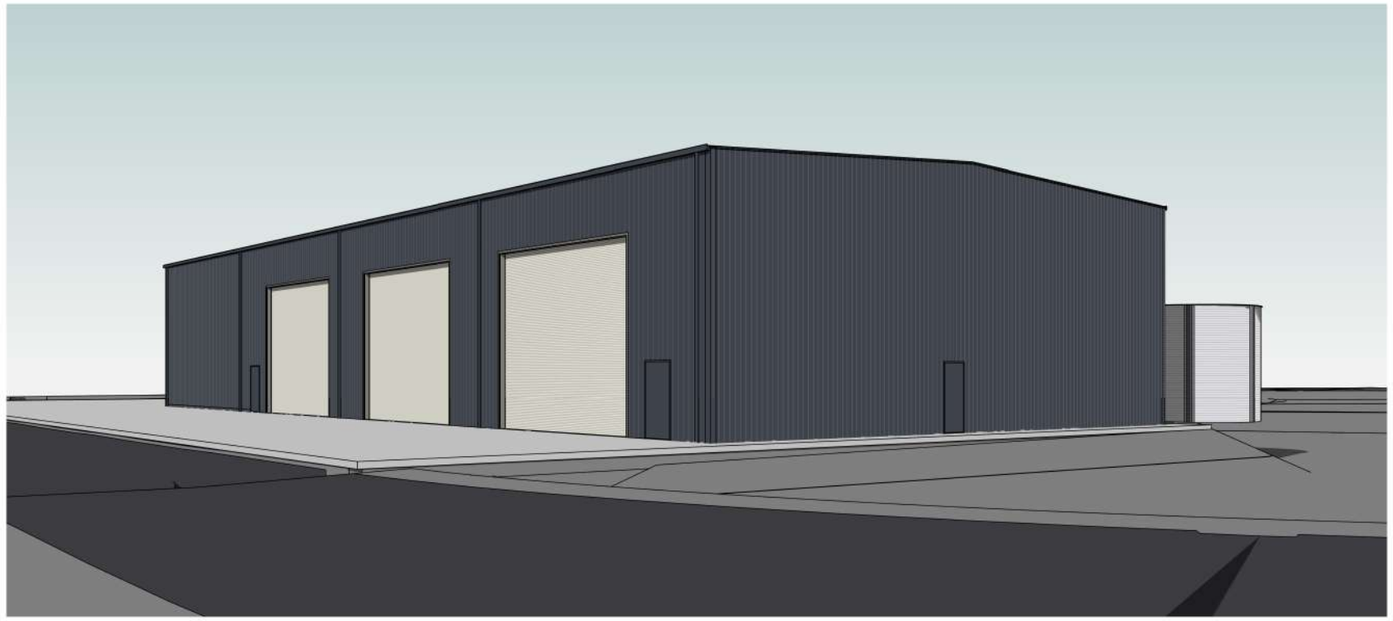
Date created	Checked	Approved
02-09-19	LE	-

Scale
1 : 200 @ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA804**	P2

Status
PRELIMINARY



01 3D PERSPECTIVE VIEW

02 3D PERSPECTIVE VIEW

Edwards + Simpson

Notes
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Revisions

Rev	Date	Reason for issue	App'd
P2	16/09/19	DEVELOPMENT APPLICATION	MS
P1	06/09/19	CLIENT REVIEW	MS

Project
TAMWORTH ORGANIC RECYCLING FACILITY
284 GIDLEY-APPLEBY ROAD
GIDLEY, NSW, 2340

Client
PITT & SHERRY
PO BOX 1409
LAUNCESTON, TAS, 7250

Drawing title
EQUIPMENT SHED - 3D PERSPECTIVES

Date created	Checked	Approved
02/09/19	MS	-

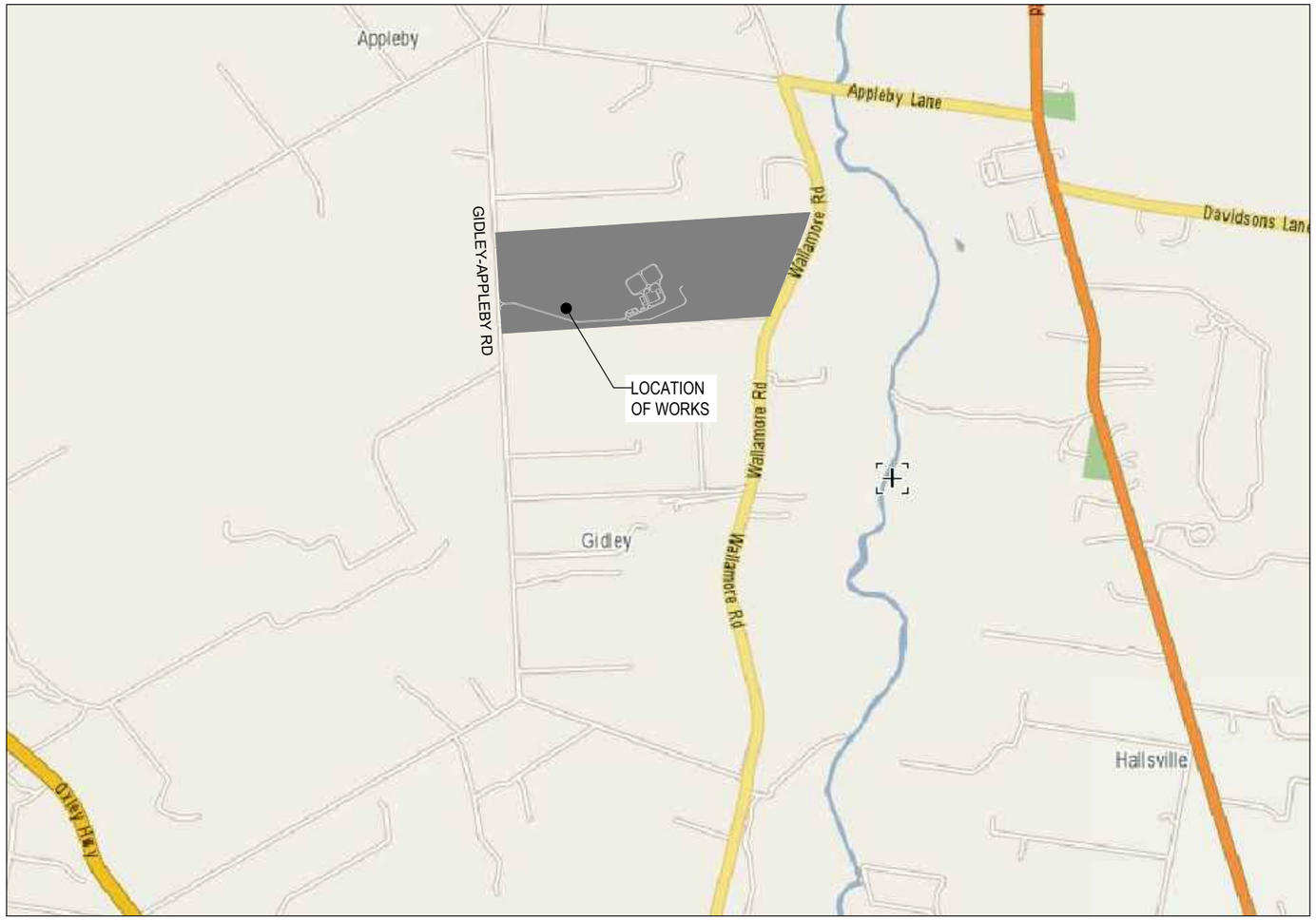
Scale
@ A3

Edwards+Simpson Pty Ltd
ABN 32 162 089 894 Building Act 2016 Licence Number CC5836I
A Level 1 68-70 St John Street Launceston TAS 7250 Australia
E office@edwardsandsimpson.com.au **T** 03 6331 1681

Project number	Drawing number	Revision
19013	**DA805**	P2

Status
PRELIMINARY

TAMWORTH REGIONAL COUNCIL
ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF



NORTH

LOCALITY PLAN
N.T.S.

DRAWING INDEX	
DRAWING NO	DESCRIPTION
GENERAL	
SY19093-G01	DRAWING INDEX AND LOCALITY PLAN
CIVIL	
SY19093-C01	OVERALL SITE LAYOUT
SY19093-C02	SITE PLAN
SY19093-C03	DRAINAGE AND STORMWATER MANAGEMENT
SY19093-C05	PAVEMENT PLAN
SY19093-C06	PROPOSED PAVEMENT COMPOSITIONS
SY19093-C11	VEHICLE SWEPT PATH - SHEET 1
SY19093-C12	VEHICLE SWEPT PATH - SHEET 2
SY19093-C13	VEHICLE SWEPT PATH - SHEET 3
SY19093-C14	VEHICLE SWEPT PATH - SHEET 4
SY19093-C21	TRAFFIC SIGNAGE - SHEET 1
SY19093-C22	TRAFFIC SIGNAGE - SHEET 2

REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
B	ISSUE FOR DA APPROVAL	T. LEWIS	T. LEWIS	A. BUCKLEY	19/09/2019
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED
SIGNED
DATE

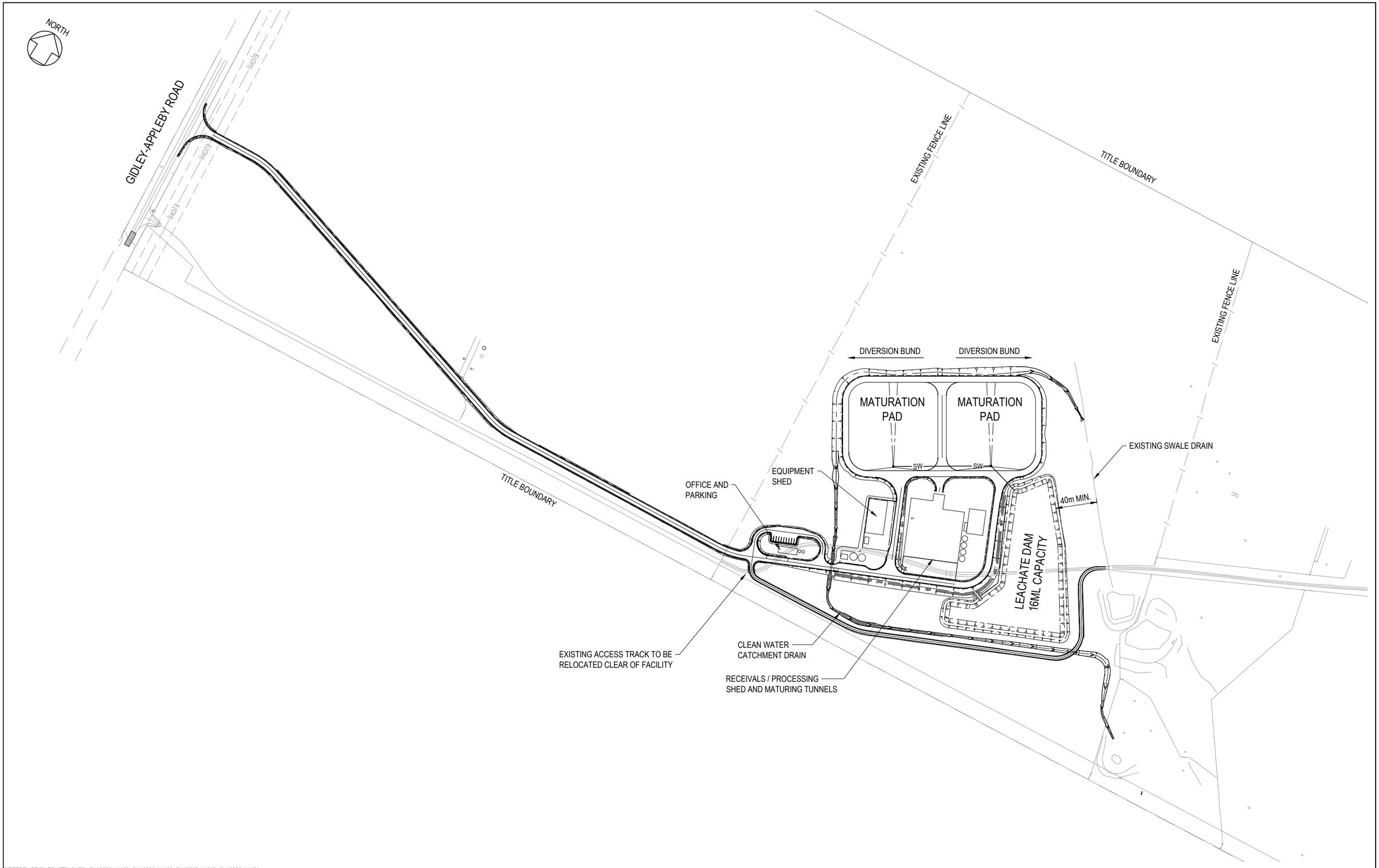
SCALE (PLOTTED FULL SIZE): AS SHOWN (A3)
SHEET SIZE: A3

pitt&sherry
BRISBANE OFFICE
241 Adelaide Street
Brisbane
Queensland 4000
Ph. (07) 3058 7499
www.pittsh.com.au
ABN 67 140 184 309

CLIENT: TAMWORTH REGIONAL COUNCIL
PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF
STATUS: **PRELIMINARY**

DRAWING TITLE: DRAWING INDEX AND LOCALITY PLAN
DATUMS: AHD / MGA
CLIENT No.: -
DRAWING No.: SY19093-G01
REVISION: B

Sep. 19, 19 - 15:04:17 Name: SY19093-G01.dwg Updated By: Tristan Lewis



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1850; SY19093-X1125

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

ORIGINAL COPY ON FILE "e" SIGNED BY

SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

40 0 40 80 120 160

SCALE IN METRES - 1:4000

pitt&sherry
BRISBANE OFFICE
241 Adelaide Street
Brisbane
Queensland 4000
Ph. (07) 3058 7499
www.pittsh.com.au
ABN 67 140 184 309

CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE OVERALL SITE LAYOUT

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C01

REVISION A

Sep. 12, 19 - 15:10:49 Name: SY19093-C01.dwg Updated By: Rachel Ng

NORTH

DIVERSION BUND

DIVERSION BUND

EXISTING SWALE DRAIN

4%

4%

2%

104m

MATURATION PAD

MATURATION PAD DRAINAGE PIT

6%

6%

SW

SW

SW

SW

4%

4%

2%

103m

MATURATION PAD

MATURATION PAD DRAINAGE PIT

6%

6%

SW

SW

EQUIPMENT STORAGE SHED

30m

99m

CLEAN WATER CATCHMENT DRAIN

70m

CARPARK

OFFICE

FUEL CUBE SELF BUNDED TANK

FIRE PUMP SHED

WATER TANKS

110m

RECEIVALS AND PROCESSING SHED

BIOFILTER

WATER TANKS

DRAINAGE OUTFALL TO LEACHATE DAM

LEACHATE DAM CAPACITY 16ML

WEIGHBRIDGE

WHEEL WASH BAY

RELOCATED ACCESS TRACK

TABLE DRAIN OUTFALL TO LEACHATE DAM

REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1125; SY19093-X1850

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

ORIGINAL COPY ON FILE "e" SIGNED BY

SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

12.5 0 12.5 25 37.5 50

SCALE IN METRES - 1:1250

pitt&sherry
BRISBANE OFFICE
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Brisbane
Queensland 4000
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ABN 67 140 184 309

CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE SITE PLAN

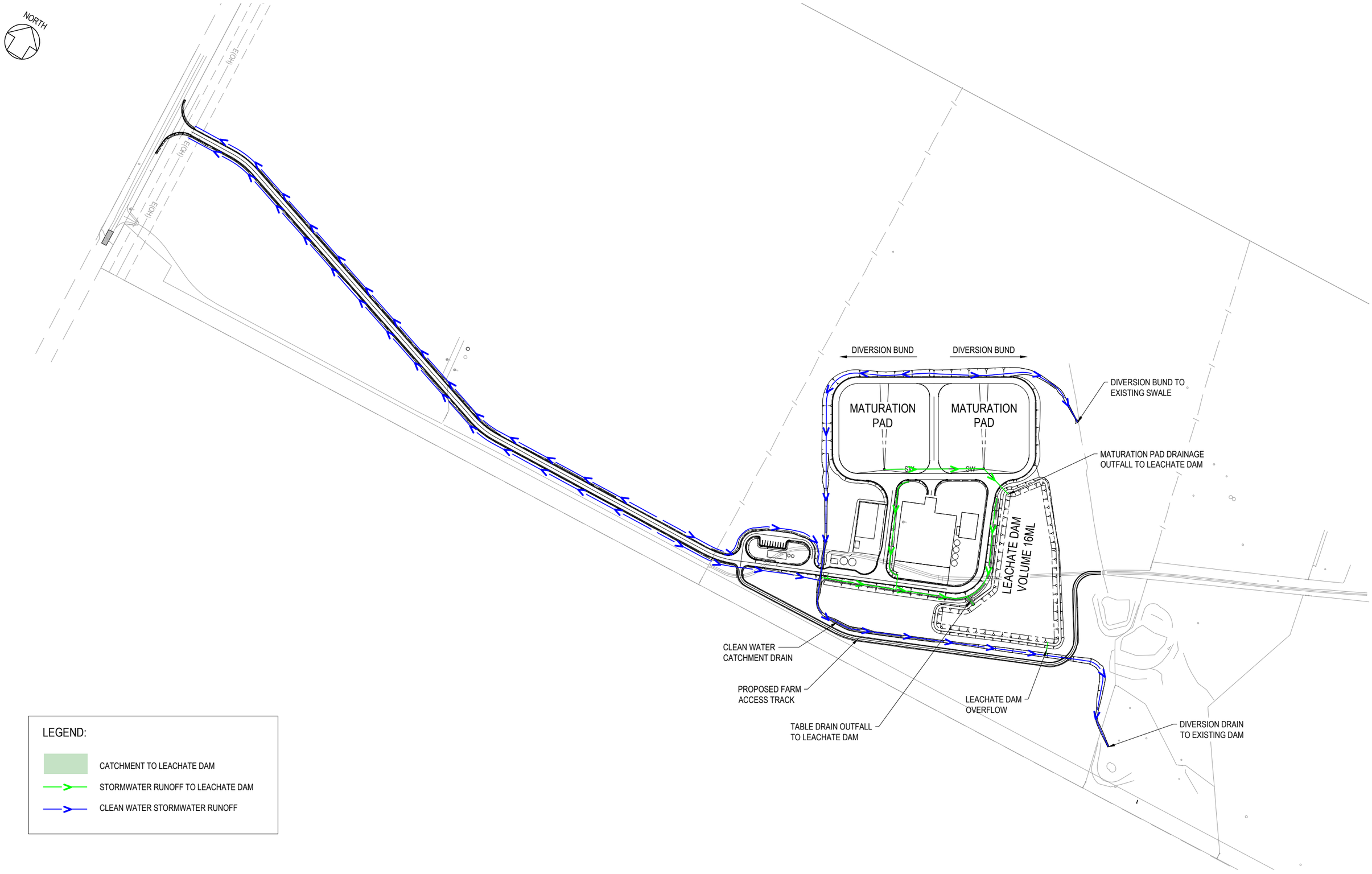
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C02

REVISION A

Sep. 13, 19 - 08:34:26 Name: SY19093-C02.dwg Updated By: Rachel Ng



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1125

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
B	ISSUE FOR DA APPROVAL	T. LEWIS	T. LEWIS	A. BUCKLEY	23/09/2019
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

ORIGINAL COPY ON FILE "e" SIGNED BY

SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

40 0 40 80 120 160

SCALE IN METRES - 1:4000

pitt&sherry
BRISBANE OFFICE
241 Adelaide Street
Brisbane
Queensland 4000
Ph. (07) 3058 7499
www.pittsh.com.au
ABN 67 140 184 309

CLIENT: TAMWORTH REGIONAL COUNCIL

PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS: **PRELIMINARY**

DRAWING TITLE: DRAINAGE AND STORMWATER MANAGEMENT

DATUMS: AHD / MGA

CLIENT No. -

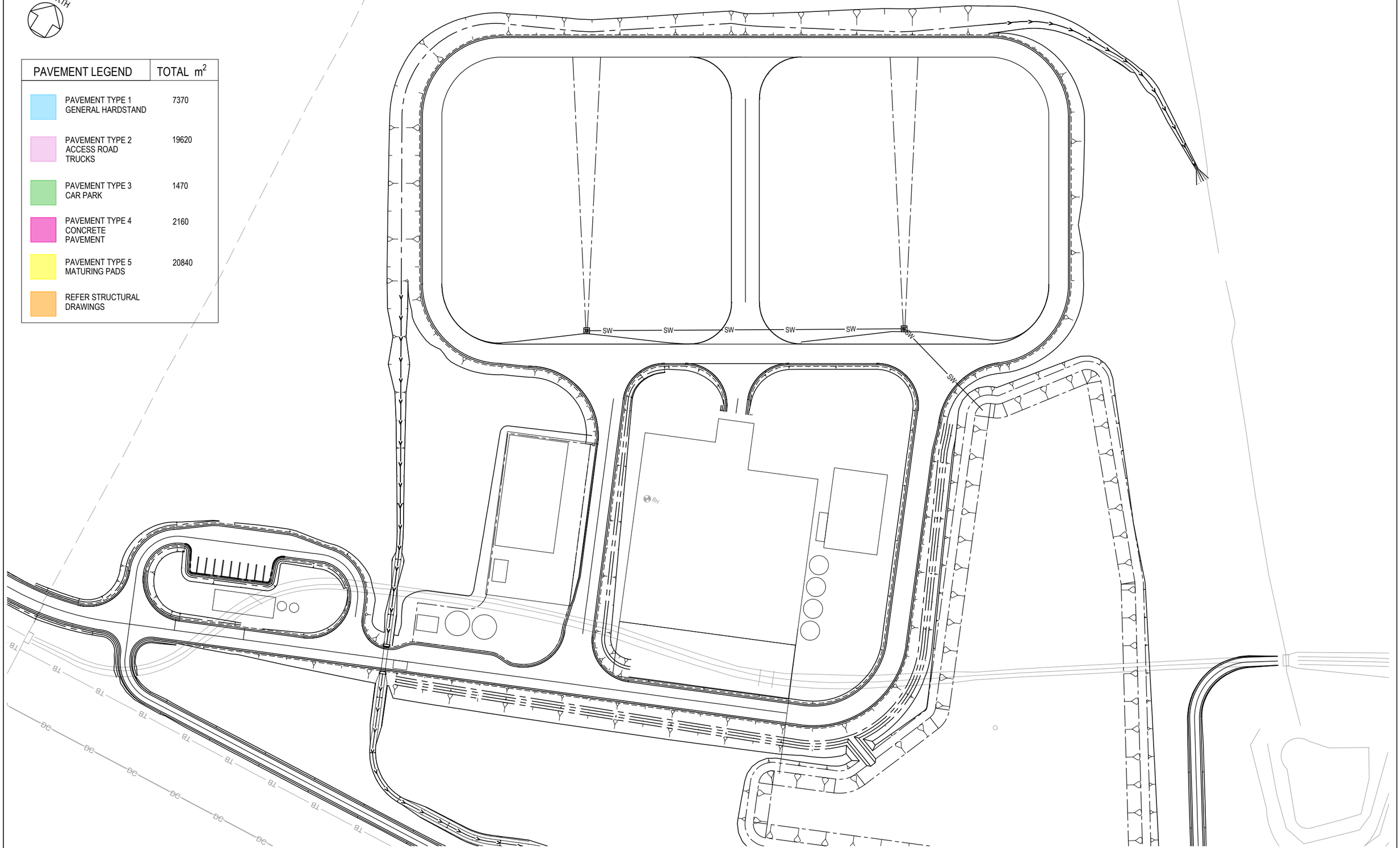
DRAWING No. SY19093-C03

REVISION B

Sep. 23, 19 - 09:53:36 Name: SY19093-C03.dwg Updated By: Tristan Lewis

NORTH

PAVEMENT LEGEND	TOTAL m^2
PAVEMENT TYPE 1 GENERAL HARDSTAND	7370
PAVEMENT TYPE 2 ACCESS ROAD TRUCKS	19620
PAVEMENT TYPE 3 CAR PARK	1470
PAVEMENT TYPE 4 CONCRETE PAVEMENT	2160
PAVEMENT TYPE 5 MATURING PADS	20840
REFER STRUCTURAL DRAWINGS	



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1850; SY19093-X1130

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

ORIGINAL COPY ON FILE "e" SIGNED BY

SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

12.5 0 12.5 25 37.5 50

SCALE IN METRES - 1:1250

pitt&sherry
BRISBANE OFFICE
241 Adelaide Street
Brisbane
Queensland 4000
Ph. (07) 3058 7499
www.pittsh.com.au
ABN 67 140 184 309

CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE PAVEMENT PLAN

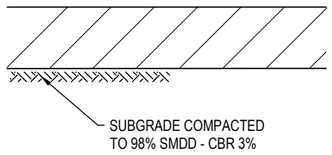
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C05

REVISION A

Sep. 12, 19 - 15:25:27 Name: SY19093-C05.dwg Updated By: Rachel Ng



A	200mm	DGB20 (REFER RMS 3051) SCALE A COMPACTION
TOTAL	200mm	

PAVEMENT TYPE 1
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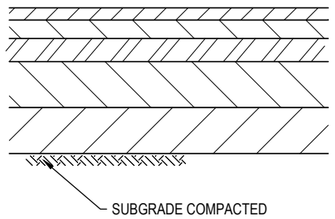
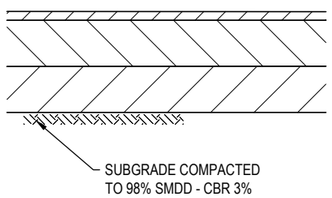


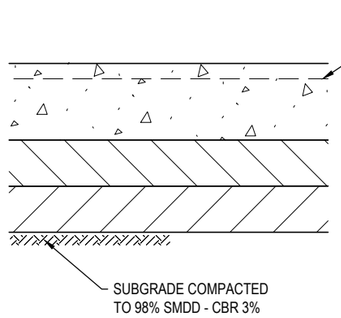
A	40mm	DG14 CLASS 320 BINDER (REFER RMS 3253)
B	60mm	DG20 CLASS 320 BINDER (REFER RMS 3253)
C	75mm	DG20 CLASS 320 BINDER (REFER RMS 3253)
D	150mm	MB20 (REFER RMS 3051) SCALE A COMPACTION
E	150mm	SMZ (REFER RMS 3071) SCALE A COMPACTION
TOTAL	475mm	

PAVEMENT TYPE 2
ACCESS ROAD TRUCKS



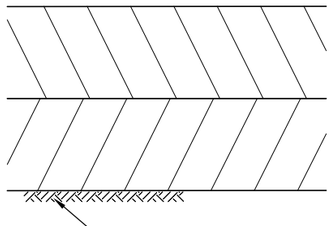
A	30mm	DG10 CLASS 320 BINDER
B	150mm	DGB20 (REFER RMS 3051) SCALE A COMPACTION
C	150mm	DGS20 (REFER RMS 3051) SCALE A COMPACTION
TOTAL	330mm	

PAVEMENT TYPE 3
CAR PARK



A	250mm	40MPa CONCRETE. MINIMUM SHRINKAGE STRAIN 450 MICROSTRAIN
B	150mm	LCS (REFER RMS R82)
C	150mm	SMZ (REFER RMS 3071) SCALE A COMPACTION
TOTAL	550mm	

PAVEMENT TYPE 4
CONCRETE PAVEMENT



A	300mm	CLAY. MAXIMUM PERMEABILITY 10 to minus 7 SCALE A COMPACTION
B	-	SCOUR SURFACE TO PREVENT LAMINATION
C	300mm	CLAY. MAXIMUM PERMEABILITY 10 to minus 7 SCALE A COMPACTION
TOTAL	600mm	

PAVEMENT TYPE 5
MATURING PADS

NOTES
1. GEOTECHNICAL ENGINEER IS INVESTIGATING WHETHER LAYERS A AND C CAN BE SITE WON (AS CURRENTLY EXISTS OR MODIFIED WITH ADDITIVES).
2. PAVEMENT CONFIGURATIONS ARE PRELIMINARY AND SUBJECT TO CHANGE. CLIENT TO PROVIDE TRAFFIC LOADING AND DESIGN CBR OF SUBGRADE.

REFERENCE FILES ATTACHED: SY19093-X1125; SY19093-X1850

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

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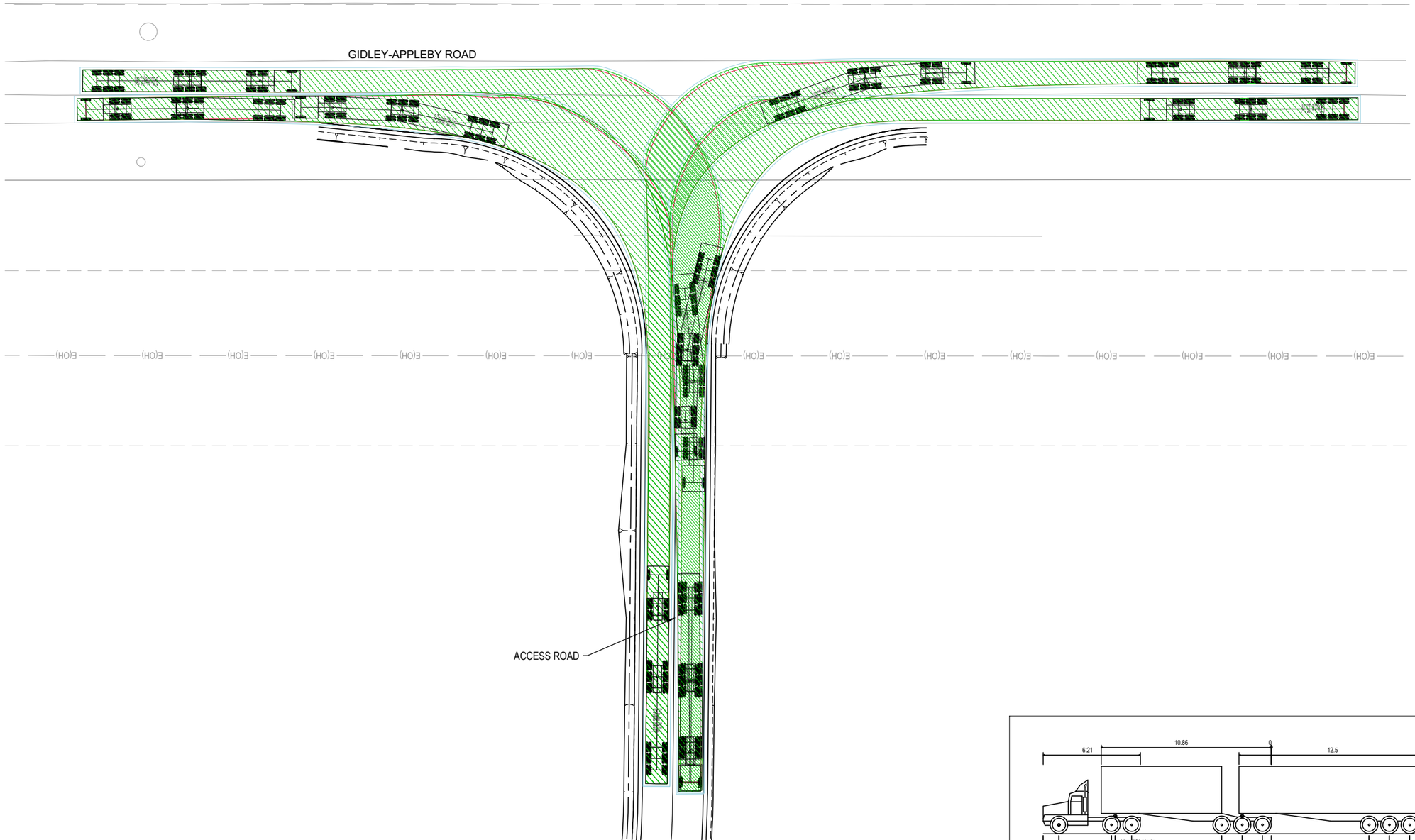
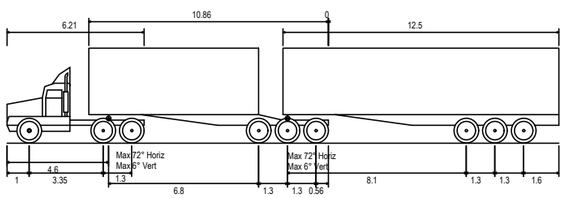
CLIENT: TAMWORTH REGIONAL COUNCIL
PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF
STATUS: **PRELIMINARY**

DRAWING TITLE: PROPOSED PAVEMENT COMPOSITIONS
DATUMS:
CLIENT No. -
DRAWING No. SY19093-C06
REVISION A
Sep. 13, 19 - 09:35:25 Name: SY19093-C06.dwg Updated By: Rachel Ng

NORTH





B-Double (25.0m)

Overall Length	25.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1125; SY19093-X1850; SY19093-X1101; SY19093-X1500

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STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 1

DATUMS: AHD / MGA

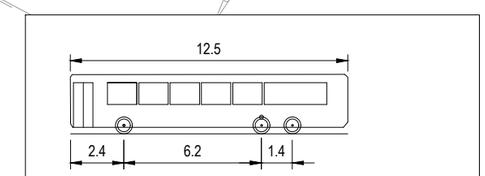
CLIENT No. -

DRAWING No. SY19093-C11

REVISION B

Sep. 23, 19 - 10:27:07 Name: SY19093-C11.dwg Updated By: Tristan Lewis

NORTH



Single Unit Truck/Bus (12.5 m)	
Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.490m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1125; SY19093-X1850; SY19093-X1101; SY19093-X1500

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STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 2

DATUMS: AHD / MGA

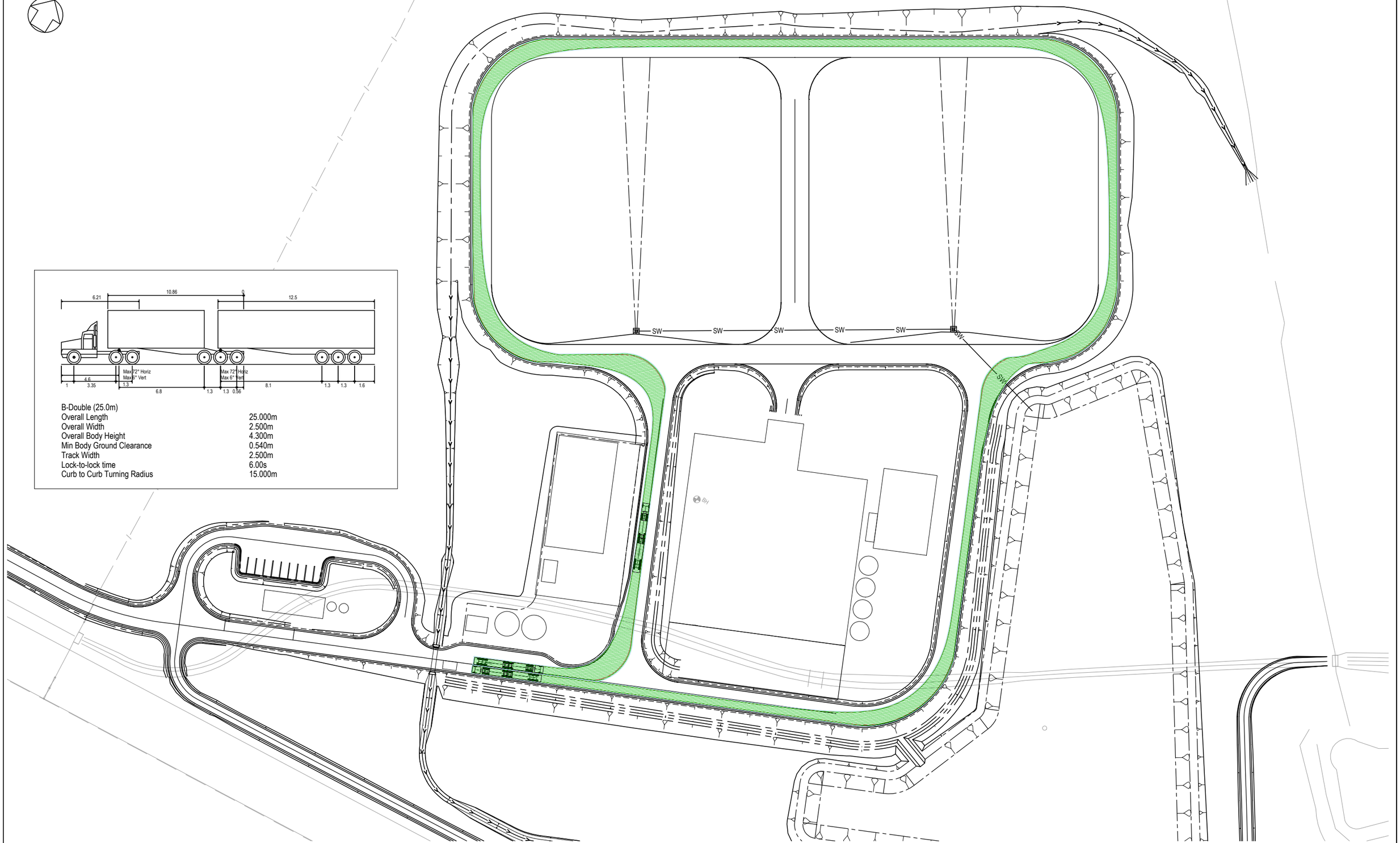
CLIENT No. -

DRAWING No. SY19093-C12

REVISION A

Sep. 13, 19 - 08:43:56 Name: SY19093-C12.dwg Updated By: Rachel Ng

B-Double (25.0m)	
Overall Length	25.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



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12.5 0 12.5 25 37.5 50

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STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 3

DATUMS: AHD / MGA

CLIENT No. -

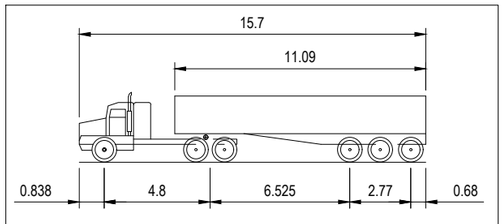
DRAWING No. SY19093-C13

REVISION A

Sep. 13, 19 - 08:39:46 Name: SY19093-C13.dwg Updated By: Rachel Ng

NORTH

RECEIVALS AND PROCESSING SHED



Prime mover and Chassis Tipper (15.7 m)	
Overall Length	15.700m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1125; SY19093-X1850; SY19093-X1500

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DRAWING TITLE VEHICLE SWEPT PATH SHEET 4

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C14

REVISION B

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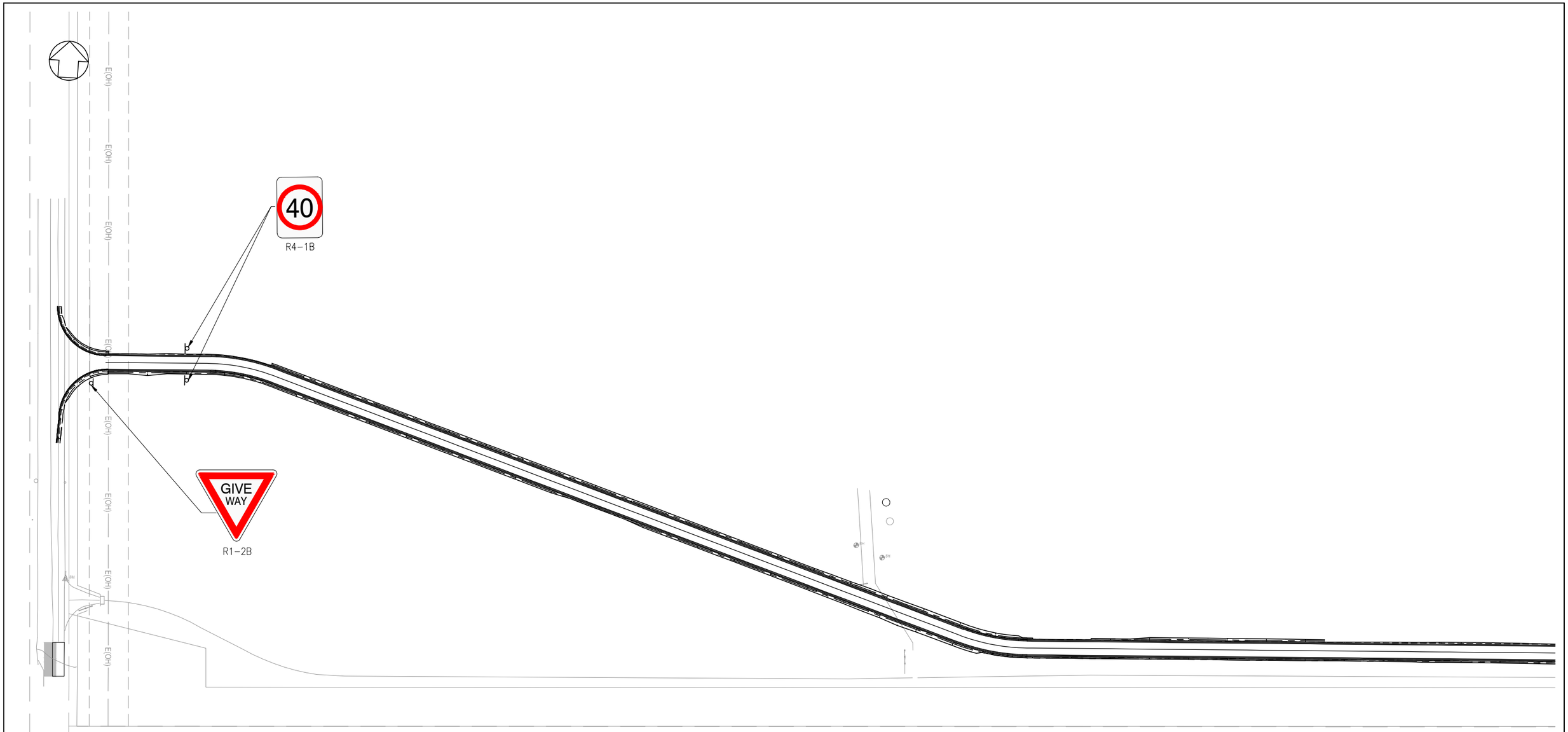

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STATUS **PRELIMINARY**

DRAWING TITLE TRAFFIC SIGNAGE SHEET 1

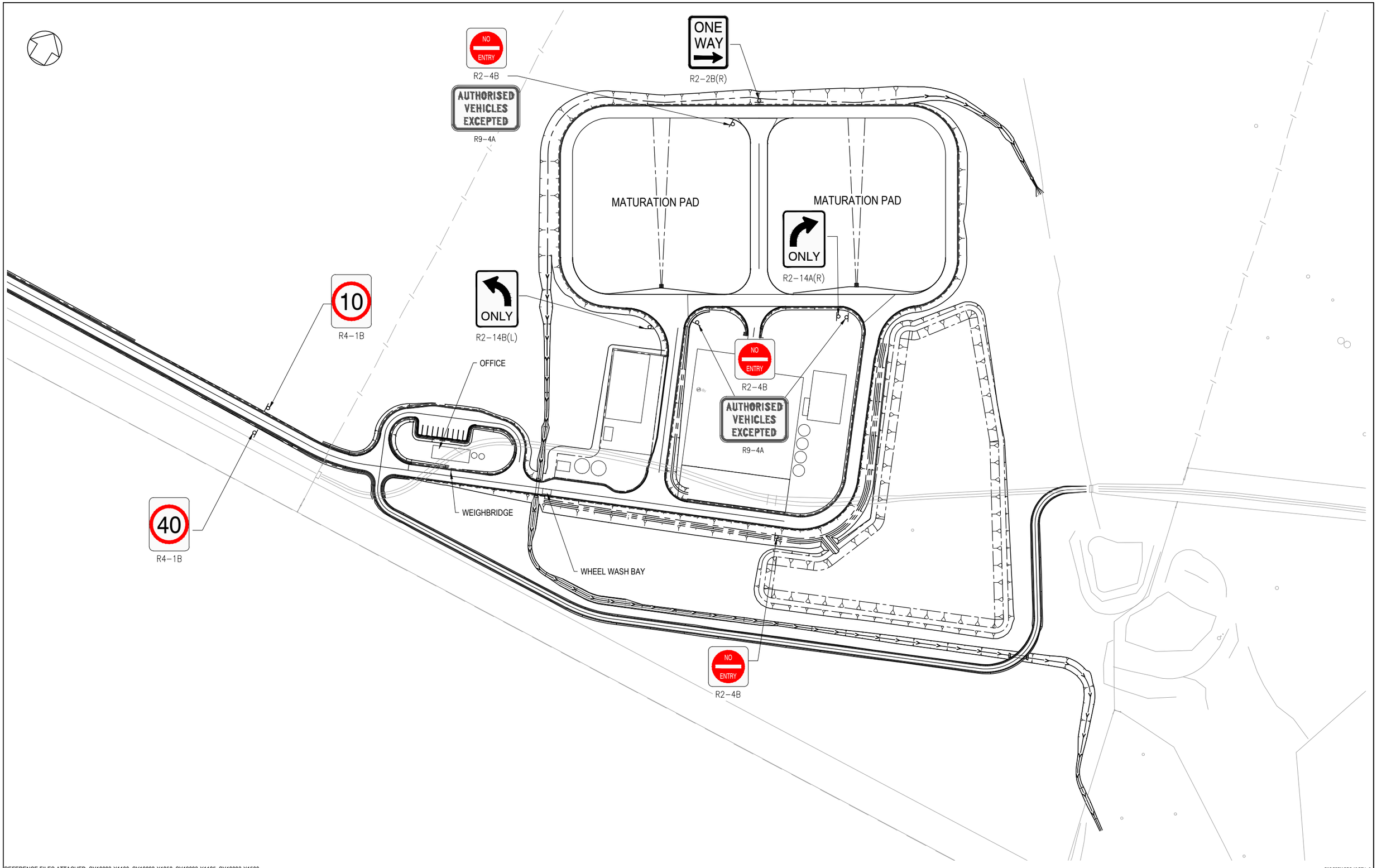
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C21

REVISION A

Sep. 12, 19 - 15:04:00 Name: SY19093-C21.dwg Updated By: Rachel Ng



REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1850; SY19093-X1125; SY19093-X1500

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SCALE IN METRES - 1:2000

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STATUS **PRELIMINARY**

DRAWING TITLE TRAFFIC SIGNAGE SHEET 2

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C22

REVISION A

Sep. 12, 19 - 15:36:47 Name: SY19093-C22.dwg Updated By: Rachel Ng

Air Quality Impact Assessment

Appendix E

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AIR QUALITY IMPACT ASSESSMENT ADVANCED ORGANICS RECYCLING FACILITY, TAMWORTH NSW

Tamworth Regional Council

19 September 2019

Job Number 18100885

Prepared by
Todoroski Air Sciences Pty Ltd
Suite 2B, 14 Glen Street
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Air Quality Impact Assessment
Advanced Organics Recycling Facility, Tamworth NSW

DOCUMENT CONTROL

Report Version	Date	Prepared by	Reviewed by
DRAFT - 001	30/01/2019	P Henschke & A Todoroski	A Todoroski
FINAL - 001	06/02/2019	A Todoroski	A Todoroski
DRAFT REV - 001	01/07/2019	P Henschke	
DRAFT REV - 002	27/07/2019	P Henschke	
DRAFT REV - 003	28/07/2019	P Henschke	
FINAL REV - 004	19/09/2019	P Henschke	A Todoroski

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1 INTRODUCTION

Todoroski Air Sciences has prepared this report for Tamworth Regional Council (hereafter referred to as the Proponent). It presents an assessment of the potential air quality impacts associated with the proposed Advanced Organics Recycling Facility at Tamworth, New South Wales (NSW) (hereafter referred to as the Project).

The Project is intended to process approximately 35,000 tonnes per annum (tpa) of organic waste material sourced from the local region using a two-stage tunnel composting process.

This assessment has been prepared in general accordance with the NSW Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**) using a methodology based on a Level 2 / 3 Odour Impact Assessment as described in the *Technical Framework – Assessment and Management of Odour from Stationary Sources in NSW* (**NSW DEC, 2006**).

This report comprises:

- A background to the Project and description of the proposed site and operations;
- A review of the existing meteorological and air quality environment surrounding the site;
- A description of the dispersion modelling approach and emission estimation used to assess potential air quality impacts; and
- Presentation of the predicted results and discussion of the potential air quality impacts and associated mitigation and management measures.

2 PROJECT BACKGROUND

2.1 Project setting

The Project site is located on 284 Gidley-Appleby Road, Tamworth, approximately 15 kilometres (km) northwest of Tamworth city (see **Figure 2-1**). The site is situated in a rural setting comprising various agricultural activities and isolated residences.

The land use surrounding the Project site includes a number of poultry broiler operations and limited residential receivers. From a planning perspective, it is generally good practice to group potentially offensive industries together. This will minimise the net land area which is impacted by odour, relative to having the same industries spread apart, however it is important to ensure that there is an adequate buffer distance to residential receivers.

Figure 2-1 presents the location of the discrete receivers considered in this assessment.

Figure 2-2 presents a pseudo three-dimensional (3D) visualisation of the topography in the general vicinity of the Project location. The general area can be characterised as being relatively flat with a gentle depression to the east of the Project site where the north flowing Peel River is located. The Project is located on a somewhat elevated ridge, which would assist with the dispersion of emissions.

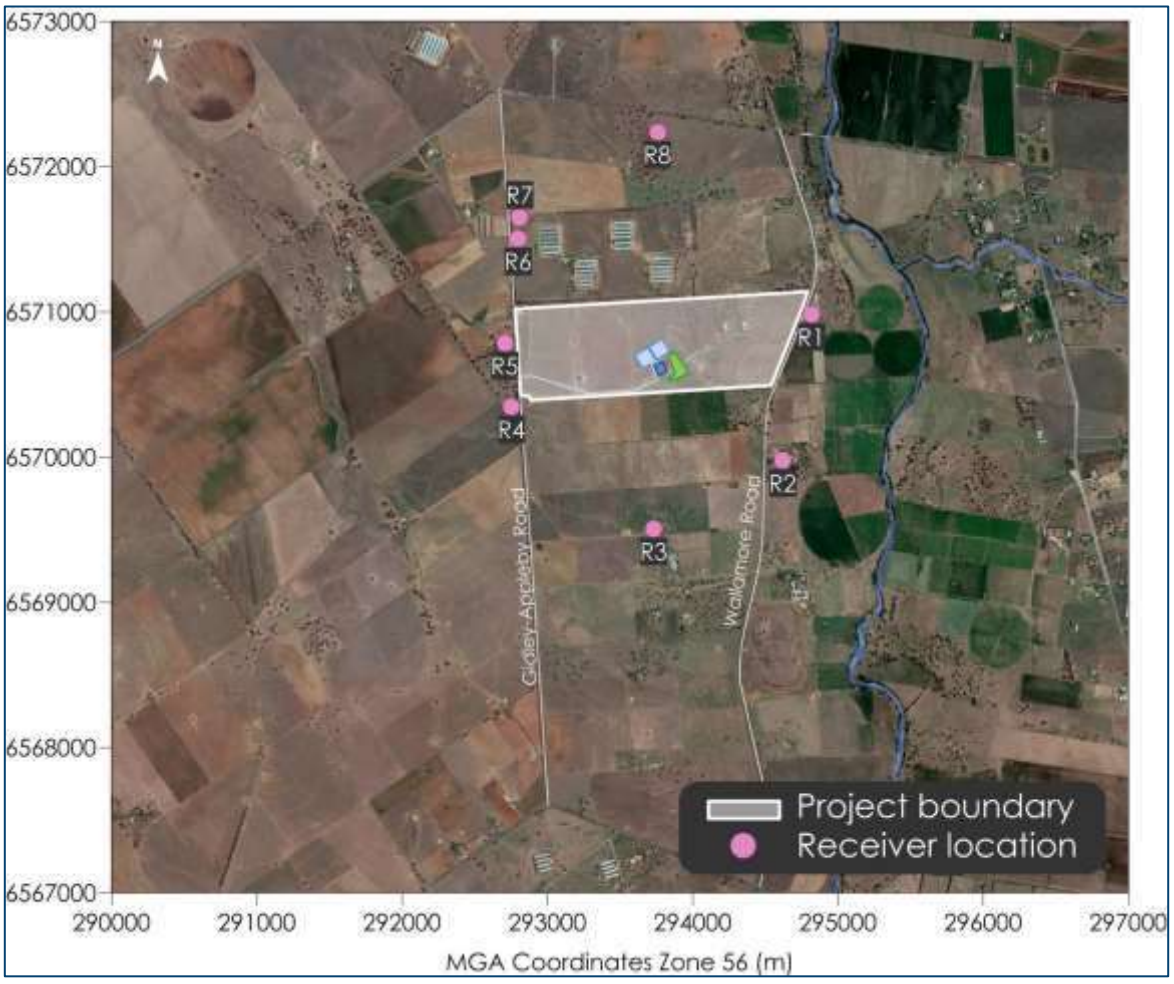

Figure 2-1: Project setting

Figure 2-2: Topography of the Project location

2.2 Project description

The Project consists of an organic recycling facility with a capacity to process up to approximately 35,000 tonnes of kerbside collected organics, self-hauled green wastes and various organic solid and liquid wastes from the agricultural sector and associated industries.

The expected end product is a range of recycled organic products which can be sold back to the community (small loads) or distributed in bulk to landscape suppliers and farmers.

The expected composition of organic waste material accepted at the facility is detailed in **Table 2-1**.

Table 2-1: Indicative organic material composition

Organic material type	Organic material quantity (tpa)	Percentage of total (%)
Mixed garden and food organics	12,750	36%
Garden organics	9,000	26%
Timber	1,600	5%
Paunch	3,800	11%
Offal	3,450	10%
Liquid waste	2,250	6%
DAF sludge	2,400	7%
Total	**35,000**	**100%**

The Project incorporates an enclosed tunnel composting process and an enclosed receiving and processing area in the main building which provides a high level of control and monitoring of critical process parameters. This design minimises the potential scope for any environmental impact from the operation and facilitates the production of consistent high quality organic products for beneficial local applications.

Odour from the facility will be treated via a purpose built biofilter to service the composting tunnels and main building.

The Project comprises the following key stages:

- Waste reception and decontamination;
- Shredding, mixing and moistening;
- Tunnel pasteurisation and composting;
- Collection and treatment of odours from the above stages in a biofilter;
- Open windrow maturation; and
- Product refinement, display and sales.

The main building provides for a large delivery area for kerbside collection material and other organic feedstock. The key objective of the main building is to manage all kerbside collected waste including other potentially odorous organic waste streams under shelter within an enclosed and air controlled building. Extracted odorous air will be treated via the biofilter.

A two-stage tunnel composting process would be used, involving a total 28-day residence time for pasteurisation. The tunnel composting employs a high rate of forced aeration and monitored / controlled process parameters to ensure aerobic conditions are maintained over the entire composting stage.

Following the 28-day composting cycle, the material is transferred to the maturation area. The maturation area has a nominal size of approximately 21,000 metres squared (m^2) adjacent to the tunnel composting plant for further maturation (up to 6-8 weeks), product stockpile and product refinement.

3 AIR QUALITY CRITERIA

3.1 Preamble

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the potential air emissions generated by the Project and the applicable air quality criteria.

3.2 Odour

3.2.1 Introduction

Odour in a regulatory context needs to be considered in two similar, but different ways depending on the situation.

NSW legislation (*Protection of the Environment Operations Act, 1997)* prohibits emissions that cause offensive odour to occur at any off-site receptor. Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, frequency, duration, character and so on and to determine whether the odour would interfere with the comfort and repose of the normal person unreasonably. In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

However, in the approval and planning process for proposed new operations or modifications to existing projects, no actual odour exists and it is necessary to consider hypothetical odour. In this context, odour concentrations are used and are defined in odour units. The number of odour units represents the number of times that the odour would need to be diluted to reach a level that is just detectable to the human nose. Thus by definition, odour less than one odour unit (1 OU), would not be detectable to most people.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour. The wide ranging response in how any particular odour is perceived by any individual poses specific challenges in the assessment of odour impacts and the application of specific air quality goals related to odour. The NSW Odour Policy (**NSW DEC, 2006**) sets out a framework specifically to deal with such issues.

It needs to be noted that the term odour refers to complex mixtures of odours, and not "pure" odour arising from a single chemical. Odour from a single, known chemical very rarely occurs (when it does, it is best to consider that specific chemical in terms of its concentration in the air). In most situations odour will be comprised of a cocktail of many substances which is referred to as a complex mixture of odour, or more simply odour.

For activities with potential to release significant odour it may be necessary to predict the likely odour impact that may arise. This is done by using air dispersion modelling which can calculate the level of dilution of odours emitted from the source at the point that such odour reaches surrounding receptors. This approach allows the air dispersion model to produce results in terms of odour units.

The NSW criteria for acceptable levels of odour range from 2 to 7 OU, with the more stringent 2 OU criteria applicable to densely populated urban areas and the 7 OU criteria applicable to sparsely populated rural areas, as outlined below.

3.2.2 Complex Mixtures of Odorous Air Pollutants

Table 3-1 presents the assessment criteria as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (**NSW EPA, 2017**). This criterion has been refined to take into account population densities of specific areas and is based on a 99th percentile of dispersion model predictions calculated as 1-second averages (nose-response time).

Table 3-1: Impact assessment criteria for complex mixtures of odorous air pollutants (nose-response-time average, 99th percentile)

Population of affected community	Impact assessment criteria for complex mixtures of odorous air pollutants (OU)
Urban (≥~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

Source: NSW EPA, 2017

The NSW odour goals are based on the risk of odour impact within the general population of a given area. In sparsely populated areas the criteria assume there is a lower risk that some individuals within the community would find the odour unacceptable, hence higher criteria apply.

Peak-to-mean factors are applied to account for any odour fluctuation above and below the mean odour level of the 1-hour averaging time. The criteria in **Table 3-1** are compared with modelled results that include peaking factors to account for the time-averaging limitations of air dispersion models. The peak-to-mean factors developed by **Katestone Scientific Pty Ltd (1995, 1998)** for NSW EPA are applied to convert the modelled (1-hour) averaging time to 1-second peak concentrations which are appropriate.

A summary of the peak-to-mean values is provided in **Table 3-2**.

Table 3-2: Peak-to-mean values

Source Type	Pasquill-Gifford stability class	Near field P/M 60*	Far field P/M 60*
Area	A, B, C, D	2.5	2.5
	E, F	2.3	1.9
Line	A-F	6	6
Surface point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A-F	2.3	2.3
Volume	A-F	2.3	2.3

*Ratio of peak 1-second average concentrations

3.3 Particulate matter

Particulate matter consists of dust particles of varying size and composition. Air quality goals refer to measures of the total mass of all particles suspended in air defined as the Total Suspended Particulate matter (TSP). The upper size range for TSP is nominally taken to be 30 micrometres (µm) as in practice particles larger than 30 to 50µm will settle out of the atmosphere too quickly to be regarded as air pollutants.

Two sub-classes of TSP are also included in the air quality goals, namely PM_{10}, particulate matter with equivalent aerodynamic diameters of 10µm or less, and $PM_{2.5}$, particulate matter with equivalent aerodynamic diameters of 2.5µm or less.

Particulate matter, typically in the upper size range, that settles from the atmosphere and deposits on surfaces is characterised as deposited dust. The deposition of dust on surfaces is considered a nuisance and can adversely affect the amenity of an area by soiling property in the vicinity.

3.3.1 NSW EPA impact assessment criteria

Table 5-1 summarises the air quality goals that are relevant to this study as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (**NSW EPA, 2017**).

The air quality goals for total impacts relate to the total dust burden in the air and not just the dust from the Project. Consideration of background dust levels needs to be made when using these goals to assess potential impacts.

Table 3-3: NSW EPA air quality impact assessment criteria

Pollutant	Averaging period	Impact	Criteria
TSP	Annual	Total	90µg/m³
PM_{10}	Annual	Total	30µg/m³
	24 hour	Total	50µg/m³
Deposited dust	Annual	Incremental	2g/m²/month
		Total	4g/m²/month

Source: NSW EPA, 2017

µg/m³ = micrograms per cubic metre

g/m²/month = grams per square metre per month

3.4 Protection of the Environment Operations Act 1997

The general obligations of the *Protection of the Environment Operations Act, 1997* (e.g. to prevent offensive odour), and the Regulations made under the Act (namely the *Protection of the Environment Operations (Clean Air) Regulation, 2010*) (e.g. to operate and maintain plant in a proper and efficient manner) would be followed at the Project.

The Project would operate in accordance with the relevant regulatory framework for air quality to ensure compliance with this legislation.

4 EXISTING ENVIRONMENT

This section describes the existing environment including the climate and ambient air quality in the area surrounding the Project.

4.1 Local climatic conditions

Long-term climatic data from the Bureau of Meteorology (BoM) weather station at Tamworth Airport Automatic Weather Station (AWS) (Site No. 055325) have been used to characterise the local climate in the proximity of the Project. The Tamworth Airport AWS is located approximately 10km south of the Project (see **Figure 2-1**).

Table 4-1 and **Figure 4-1** present a summary of data from the Tamworth Airport AWS collected over an approximate 17 to 27-year period for the various parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 32.8 degrees Celsius (°C) and July is the coldest month with a mean minimum temperature of 2.2°C.

Rainfall is variable and peaks during the summer months. The data indicate that November is the wettest month with an average rainfall of 83.1 millimetres (mm) over 7.1 days and April is the driest month with an average rainfall of 25.2mm over 2.8 days.

Humidity levels exhibit some variability and seasonal flux across the year. Mean 9am humidity levels range from 56 per cent (%) in January and October to 83% in June. Mean 3pm humidity levels vary from 35% in January to 52% in June.

Wind speeds have a similar spread between the 9am and 3pm conditions throughout the year. Mean 9am wind speeds range from 9.1 kilometres per hour (km/h) in June to 13.1km/h in November and mean 3pm wind speeds range from 14.2km/h in June to 17.9km/h in November.

Table 4-1: Monthly Climate statistics summary – Tamworth Airport AWS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (°C)	32.8	31.6	29.3	25.5	20.8	17.0	16.4	18.4	21.9	25.5	28.5	30.5	24.9
Mean min. temp. (°C)	17.5	16.9	14.4	10.1	6.0	3.7	2.2	2.7	5.8	9.6	13.3	15.6	9.8
Rainfall													
Rainfall (mm)	61.4	70.5	48.9	25.2	29.1	54.1	41.1	39.4	45.3	55.6	83.1	78.2	631.9
No. of rain days (≥1mm)	5.1	5.7	4.7	2.8	3.3	5.4	4.9	4.1	4.8	5.5	7.1	6.7	60.1
9am conditions													
Mean temp. (°C)	24.0	22.7	20.7	18.1	13.3	9.4	8.3	10.5	14.7	18.8	20.4	22.6	17.0
Mean R.H. (%)	56	63	64	60	72	83	81	71	63	56	58	57	65
Mean W.S. (km/h)	12.9	12.2	11.6	9.9	9.5	9.1	9.3	10.2	11.5	12.8	13.1	12.5	11.2
3pm conditions													
Mean temp. (°C)	30.8	29.5	28.0	24.3	19.8	16.0	15.2	17.5	20.6	23.8	26.3	28.7	23.4
Mean R.H. (%)	35	40	37	36	44	52	51	41	40	38	39	36	41
Mean W.S. (km/h)	16.8	16.3	15.8	15.1	14.3	14.2	14.8	16.9	17.3	17.5	17.9	16.7	16.1

Source: **Bureau of Meteorology, 2019 (accessed 8 January 2019)**

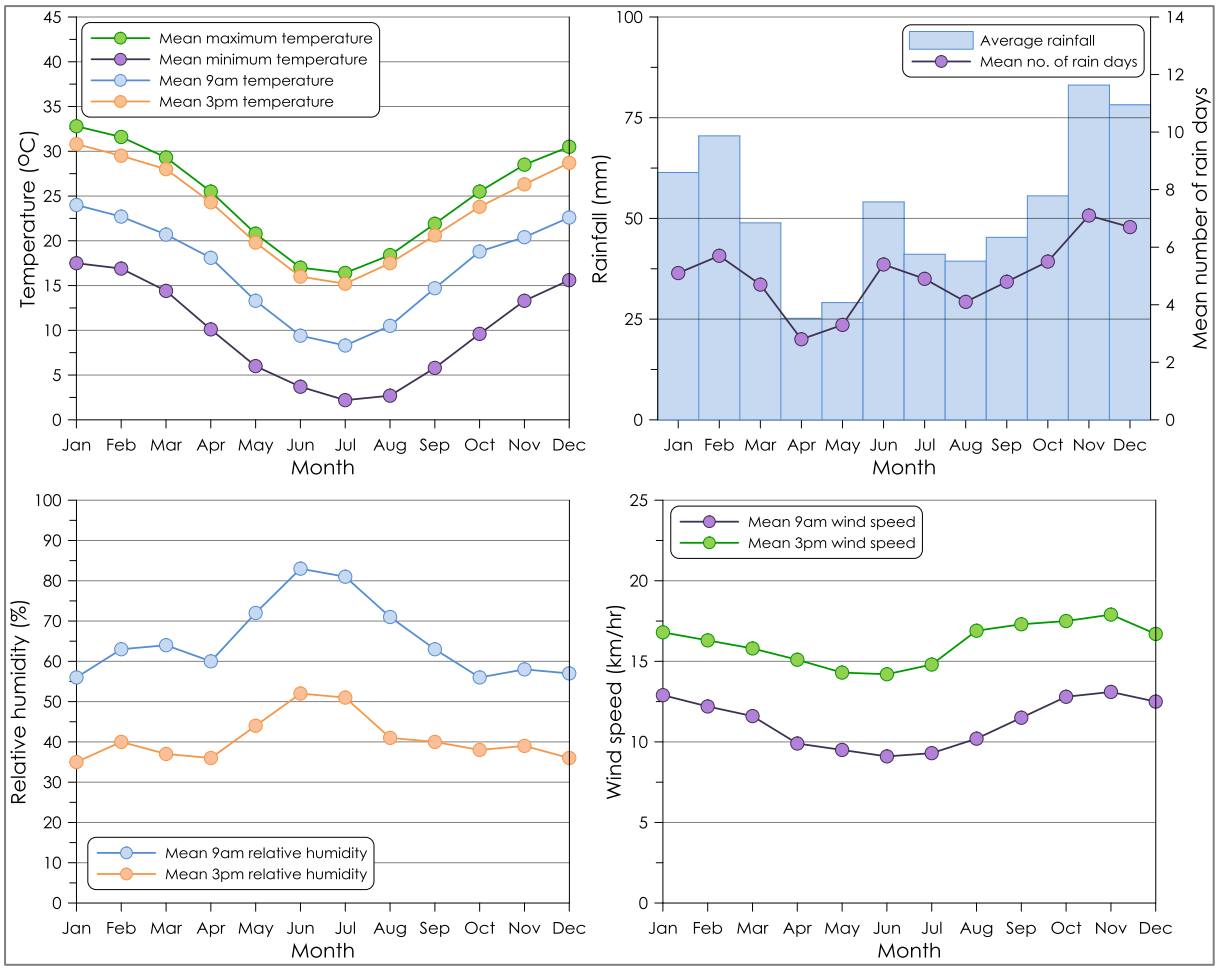

Figure 4-1: Monthly climate statistics summary – Tamworth Airport AWS

4.2 Local meteorological conditions

Annual and seasonal windroses for the Tamworth Airport AWS during the 2014 calendar period are presented in **Figure 4-2**.

The 2014 calendar year was selected as the meteorological year for the dispersion modelling based on an analysis of long-term data trends in meteorological data recorded for the area and wind patterns which reflect the patterns experienced in other years.

On an annual basis, winds typically occur along a southeast to northwest axis with the highest portion of winds from the southeast and south-southeast. In summer, strong winds are typically from the southeast and east-southeast. During autumn, winds from the southeast and south-southeast are most frequent. The winter distribution is similar to the annual distribution with dominant winds from southeast and south-southeast. For spring, the distribution is varied with a high proportion of winds originating from the southeast and south-southeast.

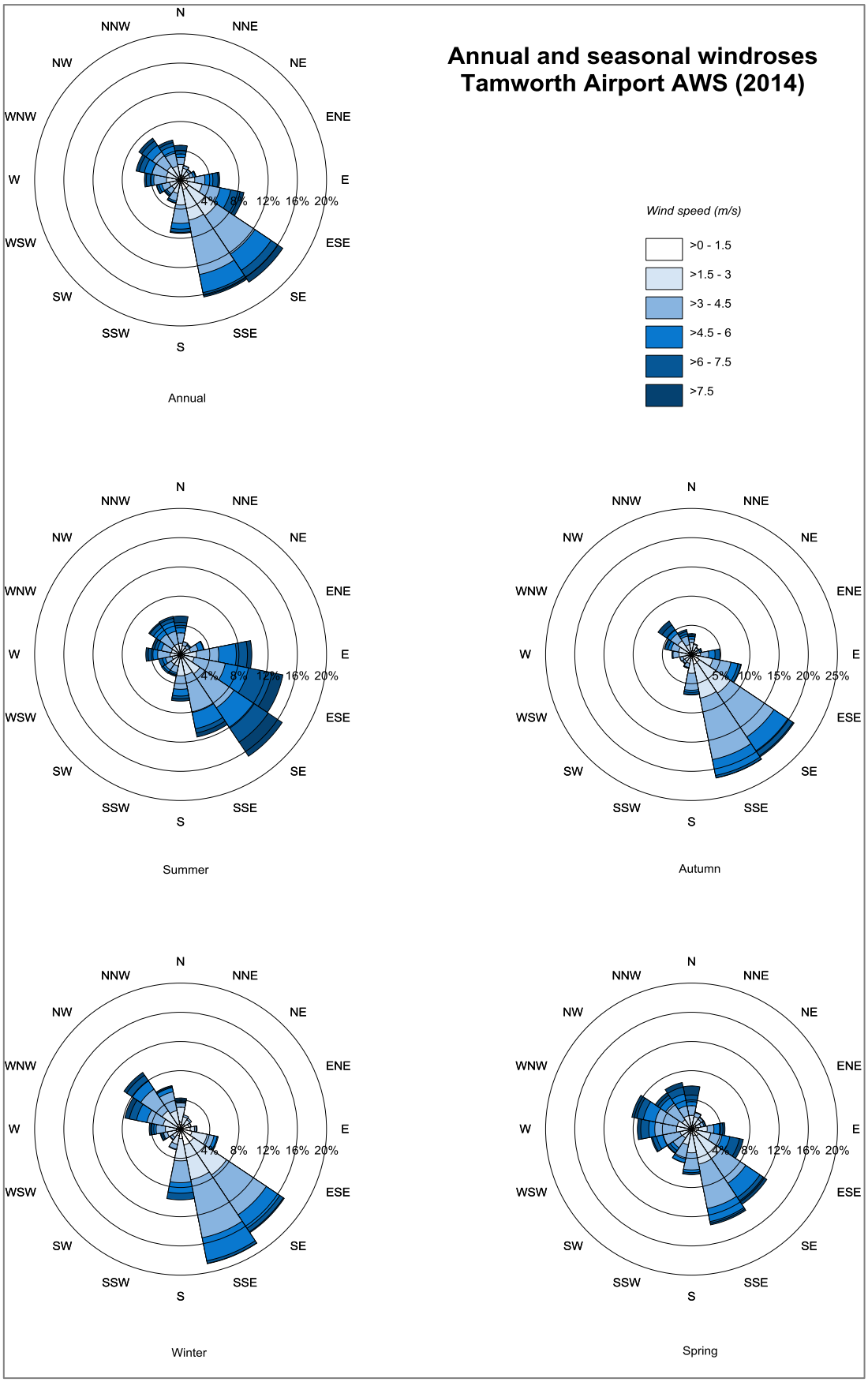

Figure 4-2: Annual and seasonal windroses – Tamworth Airport AWS (2014)

4.3 Local quality monitoring

The main sources of particulate matter emissions in the area surrounding the Project include emissions from anthropogenic activities such as motor vehicle exhaust, wood heater emissions and various commercial and industrial activities.

There are no available site-specific monitoring data for the Project site. In this circumstance, as it is necessary to utilise background data to complete the assessment, an estimate of the background levels for the Project was made based on the available data from a nearby monitoring station.

Air quality monitoring data were retrieved from a PM_{10} Tapered Element Oscillating Microbalance (TEOM) and $PM_{2.5}$ Beta Attenuation Monitor (BAM), operated by the NSW Office of Environment and Heritage (OEH) located in Tamworth (approximately 16km southeast from the Project).

Table 4-2 presents a summary of the PM_{10} concentrations for the Tamworth monitoring station reviewed from 2013 to 2017. The data indicate that for PM_{10}, annual average levels were below the relevant criterion of 25µg/m^3 and the measured dust levels on a 24-hour average basis are above the 24-hour average criterion of 50µg/m^3 on one or two days a year in this period.

Table 4-2: Summary of PM_{10} levels from Tamworth

Year	Annual average (µg/m³)	Maximum level (µg/m³)	No. of days above 50µg/m³ criterion
2013	16.6	47.5	0
2014	15.8	66.6	1
2015	14.1	52.7	1
2016	15.3	51.7	1
2017	15.3	54.1	2

Figure 4-3 shows the measured 24-hour average PM_{10} levels from the Tamworth monitoring station over the period reviewed. It can be seen in the figure that the highest sustained PM_{10} concentrations tend to occur during the spring months.

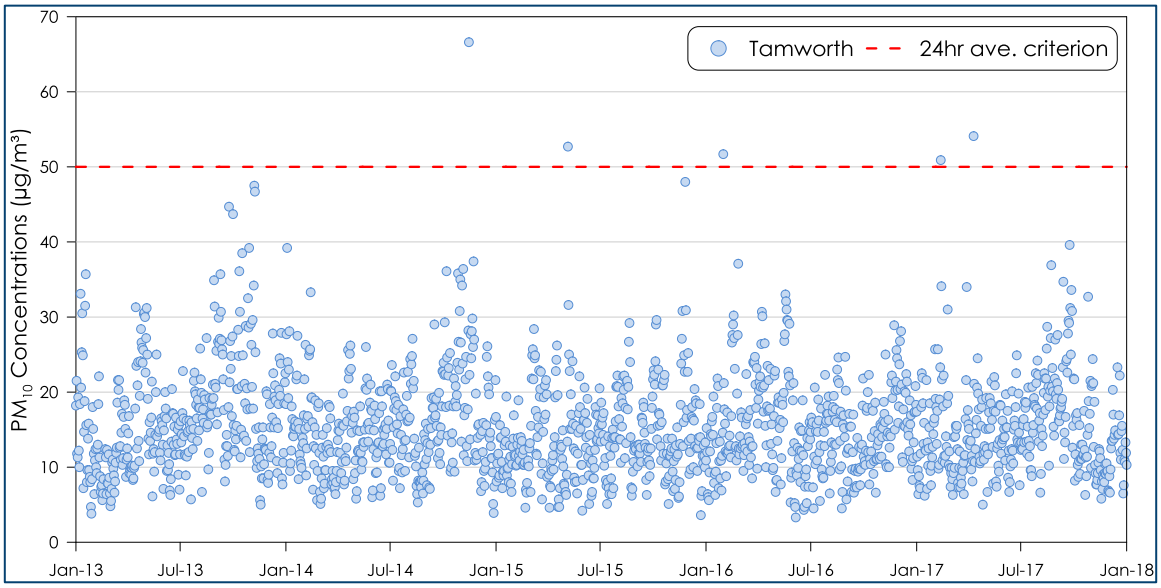

Figure 4-3: 24-hour average PM_{10} concentrations from Tamworth

Table 4-2 presents a summary of the available $PM_{2.5}$ concentrations for the Tamworth monitoring station reviewed from March 2016 to 2017. The data indicate that for $PM_{2.5}$, annual average levels were below the relevant criterion of 8µg/m^3 and measured dust levels on a 24-hour average basis are below the 24-hour average criterion of 25µg/m^3.

Table 4-3: Summary of $PM_{2.5}$ levels from Tamworth

Year	Annual average (µg/m³)	Maximum level (µg/m³)	No. of days above 25µg/m³ criterion
2016	7.6	17.6	0
2017	7.8	21.6	0

Figure 4-3 shows the measured 24-hour average PM_{10} levels from the Tamworth monitoring station over the period reviewed. Unlike the trend in the PM_{10} data, the available $PM_{2.5}$ data indicate that the highest concentrations tend to peak during the winter months and may be associated with wood heater smoke in Tamworth.

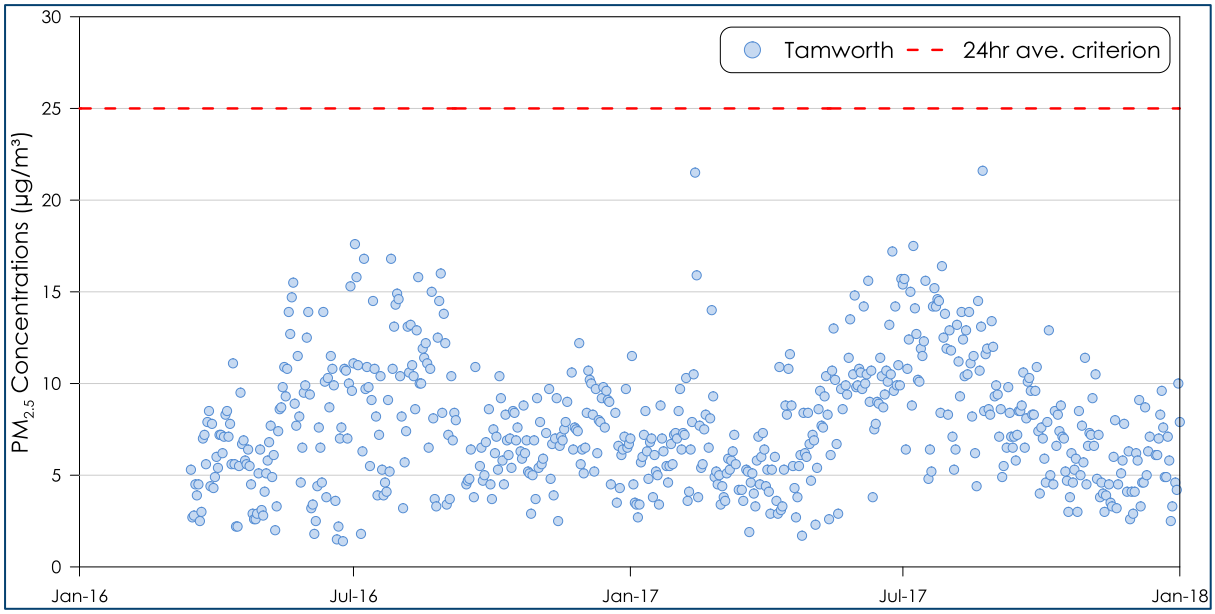

Figure 4-4: 24-hour average PM_{10} concentrations from Tamworth

5 ASSESSMENT OF POTENTIAL CONSTRUCTION DUST EMISSIONS

The establishment and construction of related infrastructure associated with the Project has the potential to generate dust emissions.

Potential construction dust emissions will be primarily generated due to material handling, vehicle movements and windblown dust generated from exposed areas. Particulate emissions would also be generated from the exhaust of construction vehicles and plant.

The potential air quality impacts due to these activities are difficult to accurately quantify on any given day due to the short sporadic periods of dust generating activity which may occur over the construction time frame. The sources of dust are temporary in nature and will only occur during the construction period.

The total amount of dust generated from the construction process is unlikely to be significant given the nature of the activities proposed. As these activities would occur for a limited period, no significant or prolonged effect at any off-site receiver is predicted.

To ensure dust generation during the construction activities is controlled and the potential for off-site impacts is reduced, appropriate (operational and physical) mitigation measures may be implemented such as those listed in **Table 5-1**.

Table 5-1: Potential construction dust mitigation options

Source	Mitigation Measure
General	Activities to be assessed during adverse weather conditions and modified as required (e.g. cease activity where reasonable levels of dust cannot be maintained)
	Engines to be switched off when not in use for any prolonged period
	Vehicles and plant would be fitted with pollution reduction devices wherever possible
	Maintain and service vehicles according to manufacturer's specifications
	Haul roads/ transport routes to be sited away from sensitive receivers where possible
Exposed areas and Stockpiles	Minimise area of exposed surfaces
	Water suppression on exposed areas and stockpiles
	Minimise amount of stockpiled material
	Locate stockpiles away from sensitive receivers
	Apply barriers, covering or temporary rehabilitation
	Progressive staging of construction activities
	Rehabilitation of completed sections as soon as practicable
	Keep ancillary vehicles off exposed areas
Material handling	Reduce drop heights from loading and handling equipment
Hauling activities	Watering of haul roads (fixed or mobile) when required
	Sealed haul roads to be cleaned regularly
	Restrict vehicle traffic to designated routes, that can be managed by regular watering
	Impose speed limits
	Wheel wash, grids or coarse aggregate near exit points to minimise dirt track out
	Street cleaning to remove dirt tracked onto sealed roads
	Covering vehicle loads when transporting material off- site

6 DISPERSION MODELLING APPROACH

6.1 Introduction

The following sections are included to provide the reader with an understanding of the model and modelling approach applied for the assessment. The CALPUFF is an advanced air dispersion model which can deal with the effects of complex local terrain on the dispersion meteorology over the modelling domain in a three-dimensional, hourly varying time step.

The model was setup in general accord with the methods provided in the NSW EPA document *Generic Guidance and Optimum Model Setting for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (**TRC**, **2011**).

6.2 Modelling methodology

Modelling was undertaken using a combination of the CALPUFF Modelling System and The Air Pollution Model (TAPM). The CALPUFF Modelling System includes three main components: CALMET, CALPUFF and CALPOST and a large set of pre-processing programs designed to interface the model to standard, routinely available meteorological and geophysical datasets.

TAPM is a prognostic air model used to simulate the upper air data for CALMET input. The meteorological component of TAPM is an incompressible, non-hydrostatic, primitive equation model with a terrain-following vertical coordinate for three-dimensional simulations. The model predicts the flows important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of larger scale meteorology provided by synoptic analysis.

The CALMET meteorological model uses the geophysical information and observed/simulated surface and upper air data as inputs to develop wind and temperature fields on a three-dimensional gridded modelling domain. CALPUFF is a transport and dispersion model that advects "puffs" of material emitted from modelled sources, simulating dispersion processes along the way. It uses the three dimensional meteorological field generated by CALMET. CALPOST is at tool used to process the output of the model and produce tabulations that summarise the results of the simulation.

6.2.1 Meteorological modelling

The TAPM model was applied to the available data to generate a three dimensional upper air data file for use in CALMET. The centre of analysis for the TAPM modelling used is 30deg 59min south and 150deg 50min east. The simulation involved an outer grid of 30km, with three nested grids of 10km, 3km and 1km with 35 vertical grid levels.

The CALMET domain was run on a 10 x 10km grid with a 0.1km grid resolution. The available meteorological data for January 2014 to December 2014 from the Tamworth Airport AWS was included in the simulation. **Table 6-1** outlines the parameters used from the station. Three dimensional upper air data were sourced from TAPM output.

Table 6-1: Surface observation stations

Weather Stations	Parameters						
	WS	WD	CH	CC	T	RH	SLP
Tamworth Airport AWS (BoM) (Station No. 055325)	✓	✓	✓	✓	✓	✓	✓

WS = wind speed, WD= wind direction, CH = cloud height, CC = cloud cover, T = temperature, RH = relative humidity, SLP = sea level pressure

Local land use and detailed topographical information was included to produce realistic fine scale flow fields (such as terrain forced flows) in surrounding areas, as shown in **Figure 6-1**.

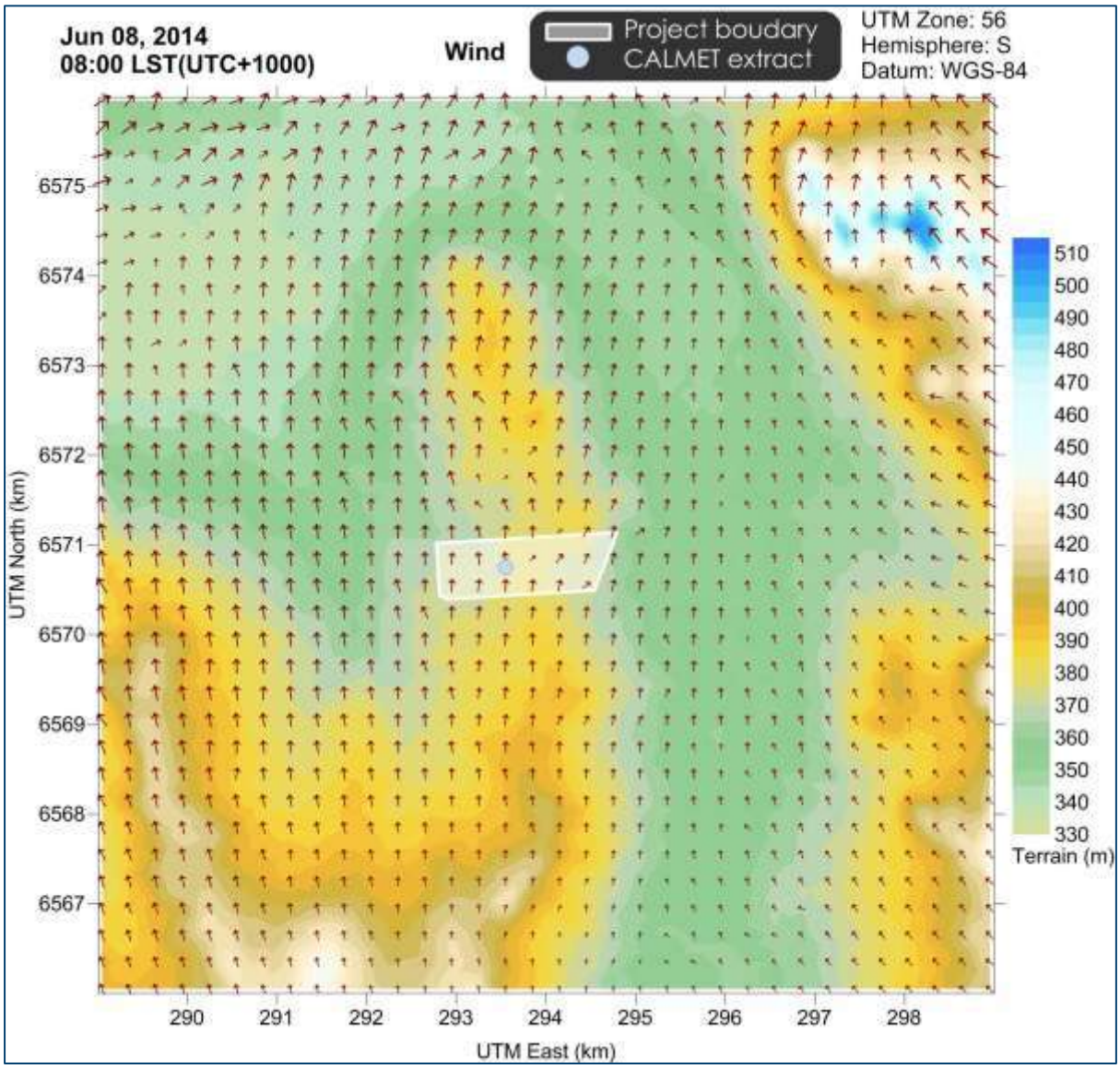

Figure 6-1: Representative 1-hour average snapshot of wind field for the Project

CALMET generated meteorological data were extracted from a point within the CALMET domain and are graphically represented in **Figure 6-2** and **Figure 6-3**.

Figure 6-2 presents annual and seasonal windroses extracted from one point in the CALMET domain. On an annual basis, winds from the south-southeast and southeast are most frequent. During summer,

winds from the southeast quadrant are most dominant with few winds from the southwest. The autumn wind distribution is similar to the annual wind distribution pattern, with a high proportion of winds from the south-southeast and southeast. In winter, winds tend to occur from the south-southeast sector. The spring distribution is typically dominated by winds from the south-southeast with varied winds from the other directions.

Overall, the windroses generated in the CALMET modelling reflect the expected wind distribution patterns of the area as determined based on the available measured data and the expected terrain effects on the prevailing winds

Figure 6-3 includes graphs of the temperature, wind speed, mixing height and stability classification over the modelling period and shows sensible trends considered to be representative of the area.

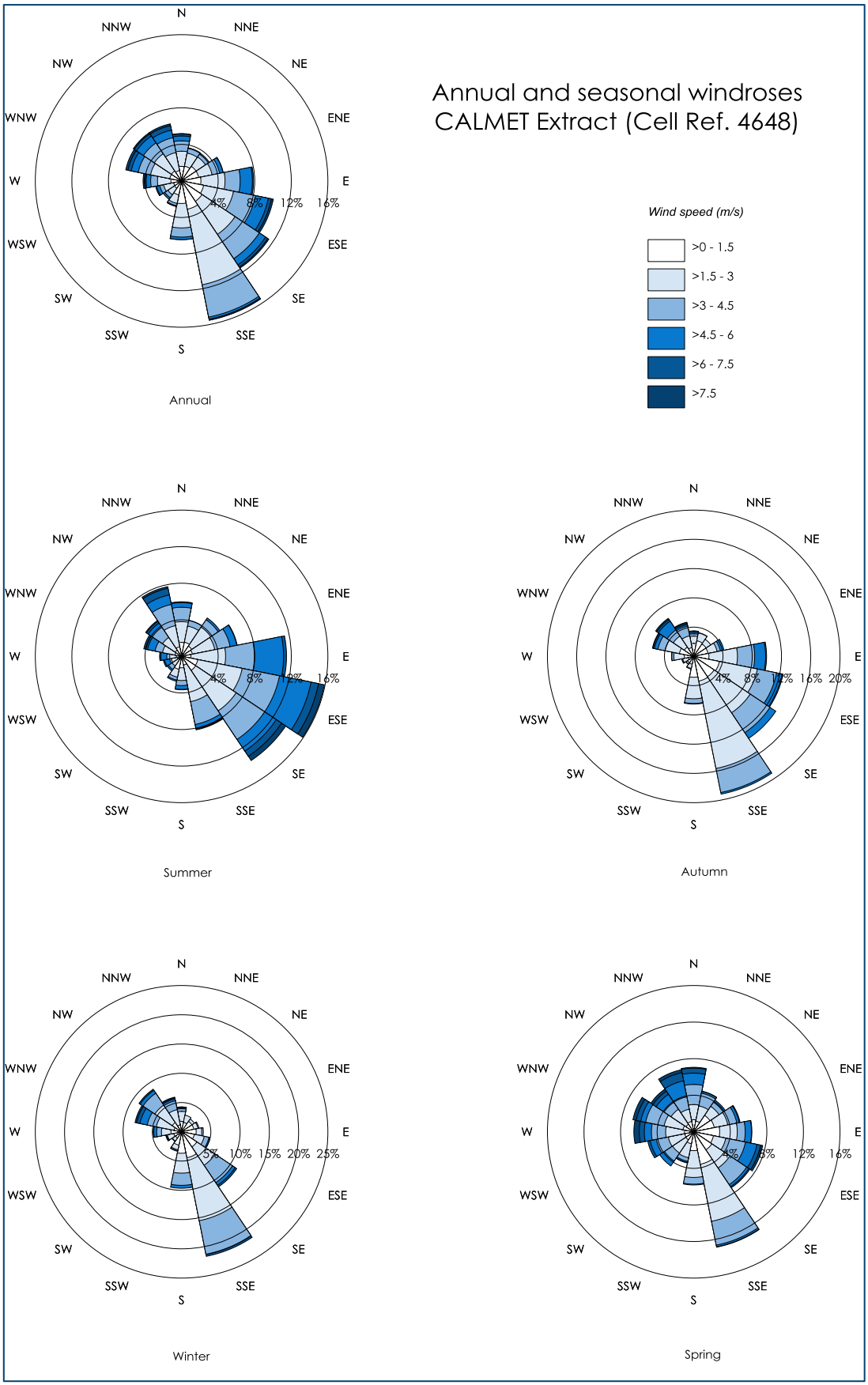

Figure 6-2: Annual and seasonal windroses from CALMET (Cell ref 4648)

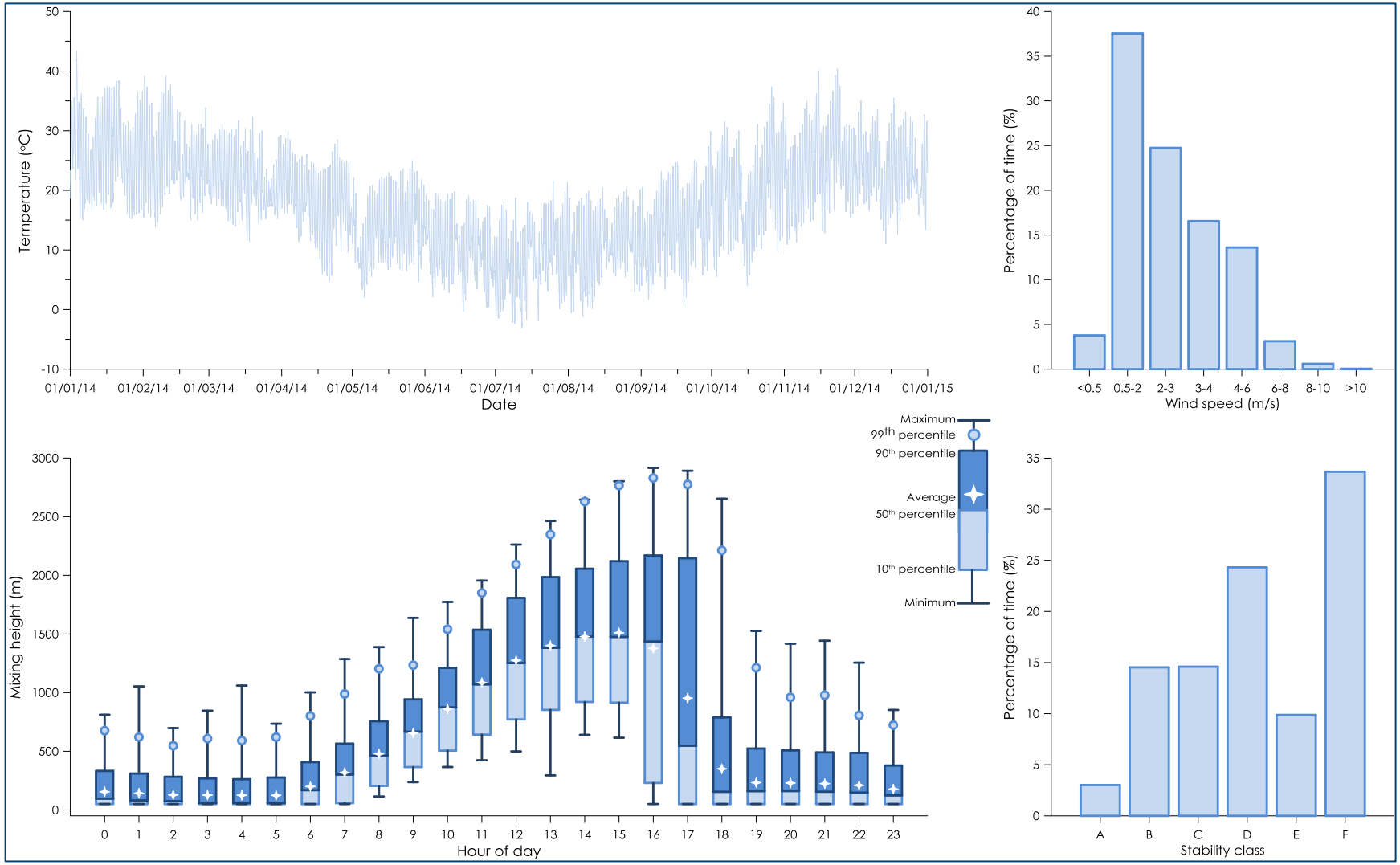

Figure 6-3: Meteorological analysis of CALMET (Cell Ref 4648)

6.2.2 Dispersion modelling

The CALPUFF air dispersion model has been used to predict the potential odour and dust levels in the ambient air in the wider area around the Project.

Modelling of the key odour and dust emission sources was conducted using the emissions rates and parameters outlined in the following section and utilising the meteorological data described in the previous section.

6.3 Emission estimation

6.3.1 Odour

Odour emissions from the Project would potentially arise from a range of sources with varying rates of odour emissions at different times due to the operational activities conducted. The main sources of odour emissions from the Project are identified as from the biofilter, and fugitive emissions from the processing of the input material streams and other sources such as the storage of material and compost handling activities.

The purpose built biofilter for the Project would be designed to achieve odour removal efficiencies of more than 90%. The total exhaust air volume into the biofilter would be a maximum 42,000m^3/hr with surface emissions not exceeding the equivalent of 500OU/m^3 and cover an area of approximately 420m^2.

Even though the main building would be fully enclosed and air controlled, there is still potential for some fugitive odour emissions to escape at times when the doors are opened for access into the building. To estimate the potential fugitive odour emissions, the different processes occurring in the main building which include stockpiling of waste material received, stockpiling of shredded material and shredding of material, were considered.

The estimated odour emissions from each of these sources are outlined in **Table 6-2** with source dimensions based on approximate areas from the main building plans. It has been assumed a nominal 15% leakage would occur from the building entry when a door may be open.

Table 6-2: Summary of odour emission rates for main building sources

Source description	Source dimensions (m^2)	SOER (OUV/m^2/s)	OER (OU/s)
stockpiling of waste material received	278	3.96	1,101
stockpiling of shredded material	556	4.26	2,367
shredding of material	-	-	5,741
Total	**-**	**-**	**9,209**

Source: Todoroski & Cowan (2015) and ERM (2013)

To estimate potential odour emissions associated with the maturation and product storage area, a review of odour emission measurement data for composting material at different stages was collated from various studies and is summarised in **Table 6-3**.

The odour measurement data show variability between the stages for each of the sampling datasets reviewed. This variability can be attributed to factors including the composition of the compost material, climatic factors and the sampling methodology. Overall, the data show a relatively similar trend of decreasing odour as the composting material matures (see **Figure 6-4**).

Table 6-3: Summary of odour measurement data for composting operations (OUV/m²/s)

Week	Site/ sample 1[(1)]	Site/ sample 2[(1)]	Site/ sample 3[(1)]	Site/ sample 4[(1)]	Site/ sample 5[(2)]	Site/ sample 6[(2)]	Site/ sample 7[(3)]	Site/ sample 8[(4)]
0	7.7	-	0.32	0.27	-	-	5.92	-
1	1.1	-	0.1	0.25	3.35	2.709	-	1.95
2	0.36	-	0.15	0.36	3.916	-	-	1.12
3	0.85	-	-	0.042	0.416	0.202	-	0.97
4	0.07	-	0.18	0.023	0.408	0.125	-	0.89
5	2	-	0.14	0.11	2.28	1.66	0.51	-
6	0.29	-	-	0.1	0.58	0.74	-	-
7	-	0.4	-	0.065	1.7	2.07	-	-
8	-	0.8	-	-	-	-	-	-
9	-	-	-	-	-	-	0.94	-

[(1)] ERM (201) [(2)] Todoroski & Cowan (2015) [(3)] TOU (2010) [(4)] GHD (2015)

The tunnel composting process would cover four weeks of time followed by the maturation stage. To conservatively estimate the potential odour emissions for the maturation and product storage, the average of the maximum measured odour level for week 5 onwards (1.4OUV/m²/s) from **Table 6-3** was considered.

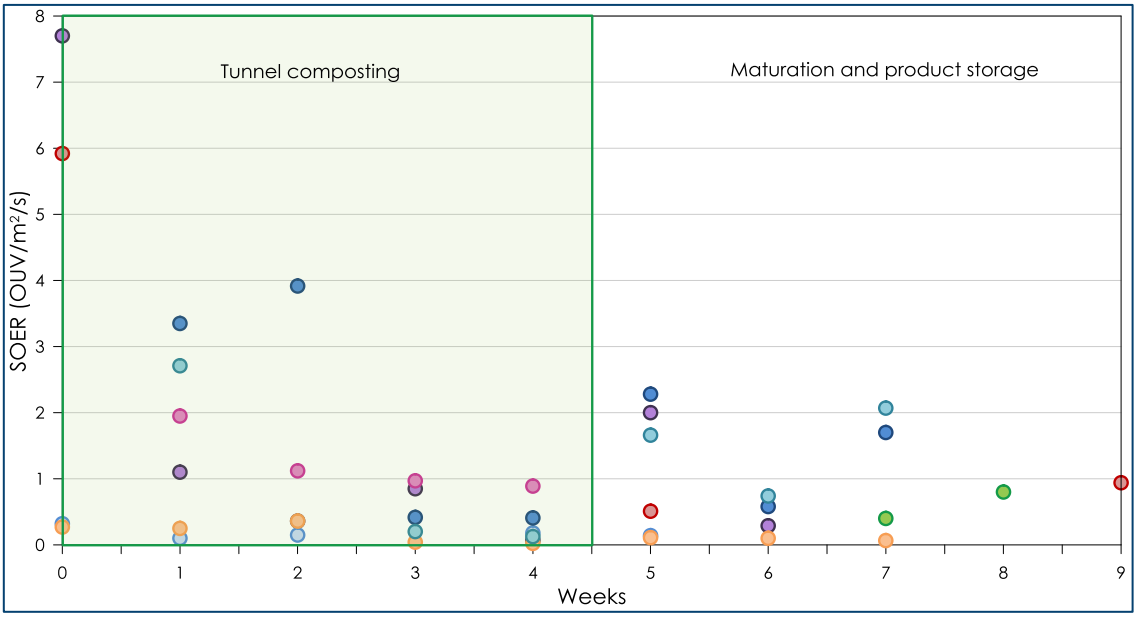

Figure 6-4: Summary of odour measurement data for composting operations

The other potential sources of odour emissions from the Project have been identified as:

- The screen located in the product storage and decontamination area;
- The leachate dam; and,
- The wheel loader / excavator operating on-site.

A summary of the modelled odour emission rates for the other Project sources applied in the dispersion modelling is presented in **Table 6-4**.

Table 6-4: Summary of odour emission rates for other Project sources

Source description	Source dimensions (m²)	SOER (OUV/m²/s)	OER (OU/s)
Screen	-	-	4,960
Leachate dam	13,500	0.33	4,455
Wheel loader / excavator	5	5.34	26.7

Source: Todoroski & Cowan (2015) and GHD (2012)

6.3.2 Other surrounding sources

Three poultry farms, located approximately 0.5km, 2km and 3km respectively to the north, north-northwest and south of the Project site, have the potential to emit adverse odour emissions in the vicinity of the Project.

We note that the character of the odours from these sources would be relatively different (to very distinctly different) to those emitted from the Project. The expectation is that the receiver would be able to determine whether the odour they may experience is coming from the poultry farms or composting odour, thus these odours are not considered to be additive.

However, for the purposes of this assessment, we have examined cumulative odour impacts due to all of the odours from the proposed operations and the existing poultry farms combined. Potential odour sources significantly more than 3km from the site were not considered in the cumulative assessment due to their likely low level of odour contribution.

In the absence of any site specific odour measurements for these poultry farm operations, an emission estimation methodology was developed based on data presented in the *Broiler Farm Odour Environmental Risk Assessment* document (**ERM, 2012**). A summary of the odour emission rates applied is outlined in **Table 6-5**.

Table 6-5: Summary of odour emission rates for poultry farms

Week	OER/s per 1000 birds
1	18
2	73
3	216
4	426
5	616
6	789
7	928
8	1,027

Source: ERM, 2012

The observed dimensions of each poultry shed obtained from available Google Earth imagery with an assumed stocking density of approximately 15 birds per square metre were used to calculate the number of birds likely to be housed in each shed. **Table 6-6** outlines the assumed parameters for each of the farm operations and **Figure 6-5** presents the location of each farm.

Table 6-6: Assumed poultry farm operation parameters in the modelling

Source	Type	No. sheds	No. birds per shed
Poultry farm 1	Broiler	5	202,500
Poultry farm 2	Broiler	24	589,620
Poultry farm 3	Breeder	16	331,200

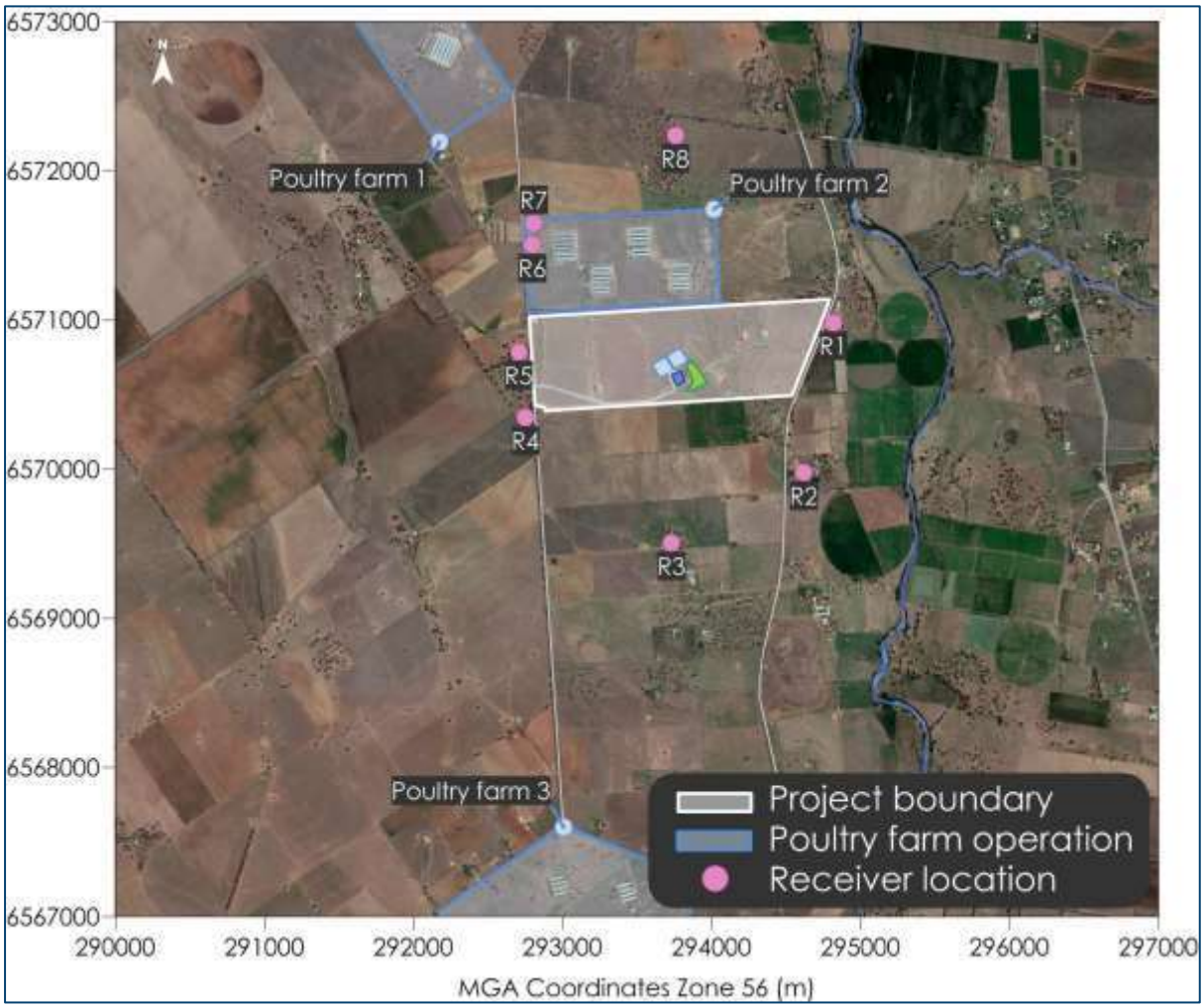

Figure 6-5: Surrounding poultry farm locations

6.3.3 Particulate matter

Activities associated with the Project have the potential to generate dust emissions from various activities including the transport of material and the processing and handling of material.

The on-site vehicle movements have the potential to generate air emissions from the exhaust and wheel generated dust when travelling on roads. Transport vehicles would travel on a paved road surface and are generally expected to be on-site for relatively short periods of time. A wheel wash for vehicles exiting the site would minimise any dirt track-out on the public road.

The recovered material delivered to the site would be expected to be relatively moist and have little potential for any dust emissions during handling. The materials handled, stockpiled and composted are likely to remain moist, and overall there is minimal risk of the generation of any excessive dust.

The material accepted at the Project would be food organics and garden organics, and although these materials are generally moist and are not dusty, as a conservative measure it is assumed in the modelling that all of the material is dusty.

Dust emission estimates for the Project have been calculated by analysing the various types of dust generating activities taking place and utilising suitable emission factors sourced from US EPA developed documentation (**US EPA, 1985 and Updates**). The estimated dust emissions for activities associated with the operation are presented in **Table 6-7**. Detailed calculations of the dust emission estimates are provided in **Appendix A**.

Table 6-7: Estimated annual dust emissions rate for the Project

Activity	TSP emission	PM_{10} emission	$PM_{2.5}$ emission
Delivering material on-site	18,419	4,694	469
Unloading material to stockpile within building	55	26	4
Loading material to shredder	55	26	4
Sorting/ Screening	625	215	47
Unloading material to stockpile	55	26	4
Loading to tunnels	55	26	4
Rehandle material	11	5	1
Loading maturation area	50	24	4
Sorting/ Screening	563	194	42
Loading product to truck for dispatch	50	24	4
Delivering material off-site	9,498	2,421	242
Wind erosion (maturation area)	425	213	32
Diesel exhaust	37	37	35
Total TSP emissions	**29,898**	**7,929**	**892**

7 DISPERSION MODELLING RESULTS

This section presents the predicted impacts on air quality which may arise from air emissions generated by the operations, and a brief analysis of the results.

7.1 Odour

7.1.1 Predicted incremental impacts

The spatial distribution of the dispersion modelling predictions for the modelled Project is presented as an isopleth diagram showing the 99th percentile nose-response ground level odour concentrations in **Figure 7-1**.

Table 7-1 presents the discrete dispersion modelling results at each of the assessed sensitive receiver locations.

The results indicate that odour levels due to the Project will be below the applicable criteria at all sensitive receiver locations.

The odour isopleths in **Figure 7-1** are generally rounded, and indicate that there are no significant drainage flows in any specific direction as the area is relatively flat, for example the Peel River falls less than 20m in elevation over ten kilometres. The results show some drift in odour occurs towards the north which is consistent with the prevailing winds and the likely drainage flow of the Peel River valley.

Table 7-1: 99th percentile nose-response average ground level odour concentrations – Project (OU)

Receiver ID	Predicted level	Odour assessment criterion*
R1	2	5
R2	2	5
R3	2	5
R4	3	5
R5	3	5
R6	4	5
R7	4	5
R8	1	5

***** See Section 8.2.

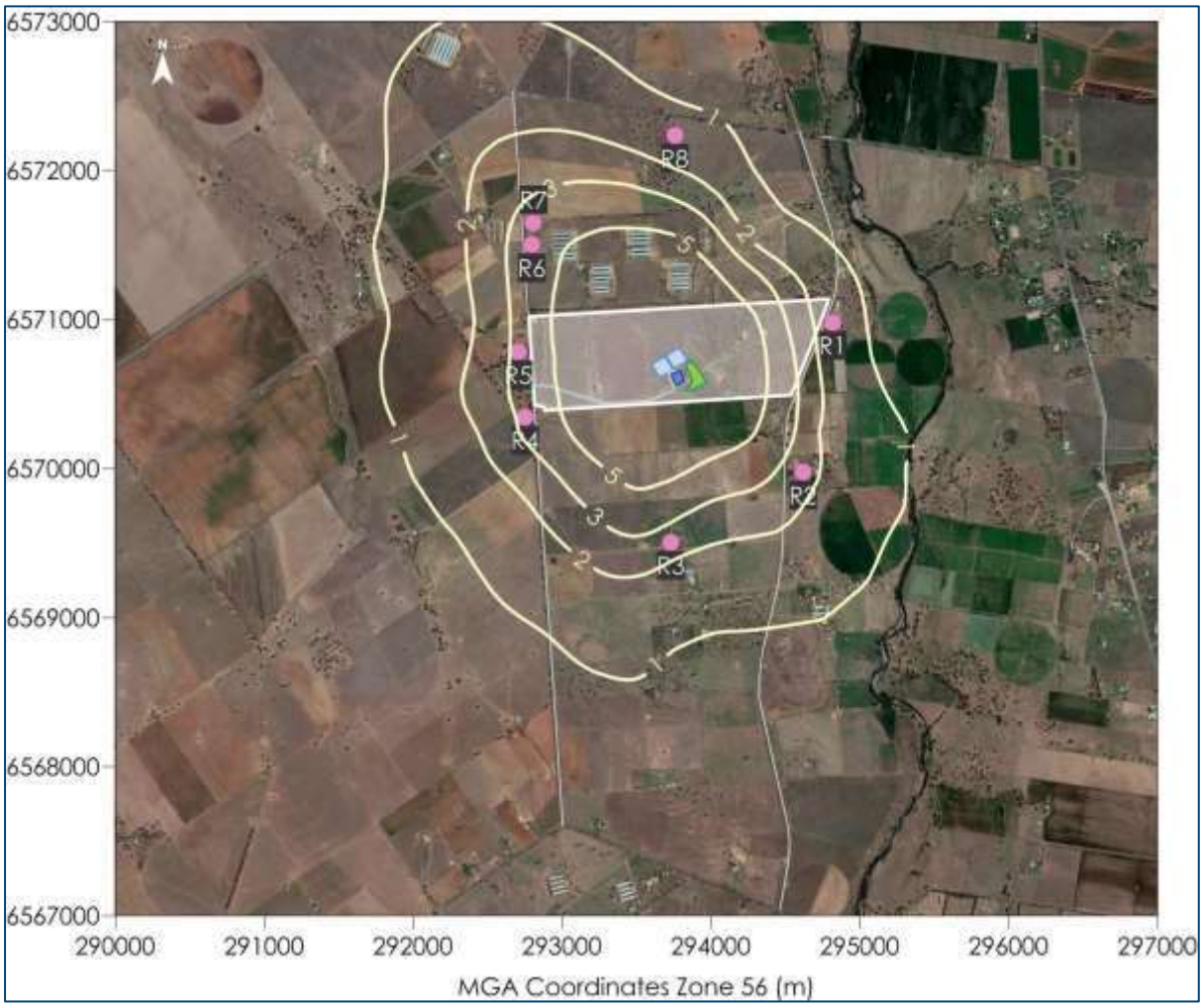

Figure 7-1: Predicted 99th percentile nose-response average ground level odour concentrations – Project only

7.2 Project odour criteria

The NSW EPA has advised that the applicable odour criteria should be calculated on the basis of the number of existing and likely future receivers within the 2 OU incremental impact contour for the Project.

The predicted odour levels were thus used to determine the applicable "population affected".

Figure 7-1 indicates there are four receivers within the 2 OU incremental impact contour and two additional receivers with predicted levels of 2 OU (refer to **Table 7-1**).

Based on the average population density per residence in Gidley of 3.7 (**ABS, 2019**), the population predicted to experience 2 OU was used to establish the applicable criteria for the Project per Equation 3.1 in the *Technical Notes - Assessment and Management of Odour from Stationary Sources in NSW* (**NSW DEC, 2006**), as follows:

$$Odour\ assessment\ criterion\ (OU) = \frac{(log_{10}(population) - 4.5)}{-0.6}$$

Table 7-1 presents the calculated odour assessment criterion.

Table 7-2: Calculated odour assessment criterion

Number of dwellings taken to be within the predicted 2 OU contour	Predicted number of people within 2 OU contour for typical operations	Odour assessment criterion (OU)
6	14.8	5.0

7.2.1 Assessment of cumulative odour impacts

In regard to cumulative odour impacts, the NSW odour policy states:

"To ensure that offensive odour impacts are maintained within acceptable levels, the incremental increase in ambient odours due to emissions resulting from a facility's operations should be assessed against the odour assessment criteria. Where it is likely that two or more facilities with similar odour character will result in cumulative odour impacts, the combined odours due to emissions resulting from all nearby facilities should also be assessed against the odour assessment criteria."

Generally, the character of the odour generated from the poultry farms would be different to the odour from the Project, and would therefore not be assessed cumulatively. However, for the purposes of this report, the potential cumulative impacts of the all of the odours from the Project and poultry farms combined have been assessed.

Figure 7-2 presents the predicted 99th percentile nose-response ground level odour impact for the Project and other sources. **Table 7-3** presents the discrete dispersion modelling results at each of the assessed sensitive receiver locations.

The results indicate that the predicted odour levels for the existing sources (i.e. poultry farms) would be above the odour assessment criterion at all locations and with the addition of the Project would also be above the odour assessment criterion. The estimated change in odour level associated with the Project ranges from <1 OU to 2 OU for the various sensitive receiver locations.

This level of change in odour is unlikely to be noticed relative to the level of existing odour impacts which would already be experienced at the sensitive receiver locations.

Table 7-3: 99th percentile nose-response average ground level odour concentrations – All odour sources (OU)

Receiver ID	Predicted level due to existing sources	Predicted level due to existing sources with the Project	Odour assessment criterion	Change in odour level
R1	9	9	5	<1
R2	8	10	5	2
R3	7	9	5	2
R4	16	17	5	<1
R5	26	26	5	<1
R6	118	120	5	2
R7	105	108	5	2
R8	23	24	5	<1

Figure 7-2: Predicted 99th percentile nose-response average ground level odour concentrations – Project and other sources

7.3 Dust

Figure 7-5 to **Figure 7-8** present isopleths of the spatial distribution of predicted incremental impacts predicted to arise due to the Project in isolation (incremental impact) for maximum 24-hour average $PM_{2.5}$ and PM_{10}, annual average $PM_{2.5}$, PM_{10}, TSP and deposited dust levels, respectively.

Table 7-4 presents the predicted particulate dispersion modelling results at each of the assessed sensitive receiver locations. The results show minimal incremental effects would arise at the sensitive receiver locations due to the Project.

The low incremental predictions in **Table 7-4**, when considered with the potential background air quality levels shown in **Section 5.3**, indicate that any potentially significant cumulative dust impacts are unlikely to occur at any receiver location.

Table 7-4: Particulate dispersion modelling results for sensitive receiver – Incremental impact

Receiver ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/month)
	Incremental impact					
	24-hour average	Annual average	24-hour average	Annual average	Annual average	Annual average
	25	-	50	-	-	2
R1	0.2	<0.1	1.4	0.1	0.2	<0.1
R2	0.2	<0.1	2.0	0.2	0.4	<0.1
R3	0.2	<0.1	1.7	0.2	0.4	<0.1
R4	0.5	0.1	4.8	0.5	1.5	0.1
R5	0.5	0.1	4.6	0.8	2.4	0.1
R6	0.2	<0.1	2.3	0.3	0.8	<0.1
R7	0.2	<0.1	2.1	0.2	0.6	<0.1
R8	0.1	<0.1	0.9	0.1	0.1	<0.1

Figure 7-3: Predicted incremental maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³)

Figure 7-4: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³)

Figure 7-5: Predicted incremental maximum 24-hour average PM_{10} concentrations (µg/m³)

Figure 7-6: Predicted incremental annual average PM_{10} concentrations (µg/m³)

Figure 7-7: Predicted incremental annual average TSP concentrations (µg/m³)

Figure 7-8: Predicted incremental annual average dust deposition levels (g/m²/month)

8 ODOUR MANAGEMENT

The inherent design of the Project incorporates odour mitigation measures to minimise the potential generation of adverse odour emissions. The mitigation measures and the choice of composting technology used for the Project thus minimise the potential for air quality impacts in the surrounding area.

A review of different composting techniques and expected investment cost is summarised in **Table 8-1**. Of the various composting techniques available, the proposed fully enclosed composting process utilises odour control techniques with a very high investment cost but also provides high levels of odour control.

Table 8-1: Summary of composting techniques

Type	Description	Odour control	Investment cost*
Vermicomposting	Vermicomposting involves using various worm species to breakdown organic material. Aeration is passive.	No odour control applied. Possible to cover windrows.	Low to medium
Open Windrow Composting	Premixed composting ingredients are formed into elongated piles. Turning of the piles acts to aerate the mix and breakdown material. Offers limited process control.	No odour control applied.	Low
Covered Aerated Static Pile Composting	Premixed composting ingredients are formed into piles similar to open windrow composting. An air distribution system is located under the pile which forces air through the pile. Covering the piles minimises odorous air being emitted.	Piles are covered with composted material to metabolise the odour, and thus minimise the amount released.	Medium
In-vessel Composting	The premixed composting ingredients are loaded into a container/vessel and sealed. Air is forced through the container with air collected in the headspace being partially recirculated through the mix and partially vented through a biofilter. Fresh air needs to be introduced into the cycle when required and oxygen depleted hot air released through a biofilter.	Possible to capture odorous air for treatment with biofilter or other odour scrubber.	High
Fully enclosed composting	Involves using in-vessel composting in a fully enclosed building operated under negative air pressure. Extracted air is typically treated through a biofilter or other type of odour scrubber prior to discharge to atmosphere.	Biofilter or other odour scrubber prior to discharge to atmosphere.	Very high

*Source: Hyder (2012)

8.1 Other mitigation measures

There is potential for other sources of fugitive odours to be generated on-site. These generally occur from the activity of receival of waste and the general handling of materials. Management practices to mitigate odour from these sources include:

- All sorting and receiving of kerbside waste to occur within the main building;
- All incoming material to be prepared for composting on the day received;
- No stockpiling of raw putrescible materials overnight under normal operating conditions;
- Co-ordinate the delivery schedule to avoid a queue of the incoming or outgoing trucks for extended periods of time;
- Engines of on-site vehicles and plant switched off when not in use;
- Fixed, well laid out roads/ paths for vehicles delivering and handling material to minimise fugitive dust and also spillage and potential fugitive odour;
- Spill management procedures to ensure immediate clean-up of any spill;
- Maintain an odour complaint logbook and in the event of a complaint conduct an immediate investigation of any odour sources, together with appropriate actions to eliminate any identified excessive odour;
- Bio-aerosols minimised by implementation of appropriate dust control procedures;
- Vehicles and plant fitted with pollution control devices in accordance with manufacturer specifications;
- Maintain and service vehicles according to manufacturer's specifications;
- Regular cleaning of all hard stand areas; and,
- Avoid significant handling of material during poor dispersion conditions where possible (e.g. time pile turning to the middle parts of the day in preference to the evening or early morning).

9 SUMMARY AND CONCLUSIONS

This report outlines an assessment of the potential air quality impacts associated with the operation of the Project.

Air dispersion modelling using the CALPUFF model was applied to predict the potential for off-site dust and odour impacts in the surrounding area due to the operation of the Project.

The predicted dust levels in the surrounding environment associated with the Project are low, and with the addition of background levels are unlikely to lead to exceedances of the criteria.

The odour impact assessment indicates odour impacts due to the Project are low, and would not lead to any unacceptable level of odour which is likely to be noticed in the surrounding environment.

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Appendix A

Dust Emission Inventory

Table A-1: Emission factor equations

Activity	Emission factor equation	Variable
Loading / emplacing material	$EF = k \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} \Big/ \frac{M^{1.4}}{2}\right) kg/tonne$	K_{tsp} = 0.74 U = wind speed (m/s) M = moisture content (%)
Hauling on sealed surfaces	$EF = k \times (sL)^{0.91} \times (W)^{1.02} kg/VKT$	k = 3.23 (g/VKT) sL = road surface silt loading (g/m^2) W = average weight of vehicles (tons)
Screening of material	$EF = 0.0125 kg/t$	-

Table A-2: Emissions Inventory

Activity	TSP emission	PM10 emission	PM25 emission	Intensity	Units	Emission Factor - TSP	Emission Factor - PM10	Emission Factor - PM25	Units	Var. 1	Units	Var. 2	Units	Variable 3 - TSP	Variable 3 - PM10	Variable 3 - PM25	Units	Var.4	Units	Var. 5	Units	Var. 6	Units
Delivering material on-site	18,419	4,694	469	50,000	t/yr	0.4276	0.1090	0.0109	kg/t	10.3	tonnes/load	2.2	km/return trip	1.69	0.43	0.04	kg/VKT	4.80	S.C. (%)	17.6	Ave GMV (tonnes)		% control
Unloading material to stockpile within building	55	26	4	50,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Loading material to shredder	55	26	4	50,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Sorting/ Screening	625	215	47	50,000	t/yr	0.0125	0.0043	0.0009	kg/t														% control
Unloading material to stockpile	55	26	4	50,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Loading to tunnels	55	26	4	50,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Rehandle material	11	5	1	10,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Loading maturation area	50	24	4	45,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Sorting/ Screening	563	194	42	45,000	t/yr	0.0125	0.0043	0.0009	kg/t														% control
Loading product to truck for dispatch	50	24	4	45,000	t/yr	0.0011	0.0005	0.0001	kg/t	0.93	Ave. (WS/2.2)1.3	2.0	M.C. (%)										% control
Delivering material off-site	9,498	2,421	242	45,000	t/yr	0.2450	0.0624	0.0062	kg/t	27.0	tonnes/load	2.2	km/return trip	2.54	0.65	0.06	kg/VKT	4.80	S.C. (%)	44.0	Ave GMV (tonnes)		% control
Wind erosion (maturation area)	425	213	32	1.00	ha	850.0	425.0	63.8	kg/ha/yr													50	% control
Diesel exhaust	37	37	35																				% control
Total TSP emissions (kg/yr)	**29,898**	**7,929**	**892**																				

Noise and Vibration Impact Assessment

Appendix F

pitt&sherry

Noise and Vibration Impact Assessment

Proposed Organics Recycling Facility
Tamworth, NSW.

Prepared for: pitt&sherry (Operations) Pty Ltd
September 2019
MAC160296RP2V1

Muller Acoustic Consulting

Document Information

Noise and Vibration Impact Assessment

Proposed Organics Recycling Facility, Tamworth, NSW.

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MAC160296RP2V1	Final	16 September 2019	Dale Redwood		Oliver Muller	

CONTENTS

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by pitt&sherry (Operations) Pty Ltd (PS) on behalf of Tamworth Regional Council (TRC) to prepare a Noise and Vibration Impact Assessment (NVIA) for the proposed Organics Recycling Facility (ORF) to be established in Gidley, north-west of Tamworth NSW (the 'Site').

The NVIA was completed to quantify potential acoustic impacts associated with the operation and construction of the ORF on the surrounding community and will accompany the Environmental Impact Statement (EIS) that is being prepared to assess the proposed development. The NVIA has been prepared taking into consideration requirements outlined in the Secretary's Environmental Noise Assessment Requirements (SEARs) (ref: SEAR1340) issued by the NSW Department of Planning and Environment (2018) and in accordance with the following policies and guidelines:

- Environment Protection Authority's (EPA's), Noise Policy for Industry (NPI), 2017;
- Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline (ICNG); and
- Department of Environment, Climate Change and Water NSW (DECCW), Road Noise Policy (RNP), 2011.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Background

TRC proposes to construct and operate an ORF processing up to 35,000 tonnes per annum (tpa) at Lot 61 of DP 707563. The ORF would allow TRC to pursue the processing of a wider range of organic materials including domestic and commercial food waste, grease trap solids and abattoir putrescibles.

The proposed facility would utilise an enclosed and covered tunnel system in conjunction with windrows. Key features of the proposed facility and its components include:

- A network of paved internal access roads to facilitate movements within the Site;
- Weighbridge, site office, equipment shed and water storage tanks;
- Vehicle wash bay;
- Enclosed receival hall;
- Enclosed tunnel composting system with biofilter;

- Maturation and pasteurisation area;
- Water management infrastructure; and
- Landscaping, lighting, signage and security.

The expected end product is a range of recycled organics products that can be sold back to the community (small loads) or distributed in bulk to landscape suppliers and farmers.

Organic waste will be received and dispatched via vehicular deliveries to the Site via and entry/exit on Gidley-Appleby Road. The majority of vehicles entering the Site will turn north onto Gidley-Appleby Road via Wallamore Road and Gidley Siding Road. Vehicles accessing the site from Manilla Road or the Oxley Highway will turn south onto Gidley-Appleby Road from Appleby-Lane.

Egress from the Site will be via a right-hand turn onto Gidley-Appleby Road. All heavy vehicles exiting the Site will turn north onto Gidley-Appleby Road towards Appleby Lane to access Manilla Road or the Oxley Highway.

The proposed hours of operation of the ORF are between the hours of 8am to 4:45pm Monday to Sunday. It is understood that several items of plant associated with the processing equipment have the potential to operate 24 hours over a seven-day period. These include tunnel ventilation fans, and aerators and pumps associated with leachate, liquid waste and stormwater processes.

1.2 Vibration Impacts

The potential for vibration impacts have been qualitatively reviewed for this assessment. The review identifies that vibration impacts from the ORF would be negligible.

The Construction Noise Strategy (Transport for NSW, 2012) sets out safe working distances to achieve the human response criteria for vibration. The minimum distance to achieve the residential human response criteria for continuous vibration using an >18tonne roller is 100m, this would be significantly less for wheeled plant, such as wheel loaders and trucks which will be the main vibration generating source on-site. The nearest privately-owned residential receiver to the ORF is approximately 950m away, while the nearest residential receiver to the proposed intersection upgrade works is approximately 175m away. Therefore, human exposure to vibration is not expected. Furthermore, where the human response criteria are satisfied, the structural criteria for sensitive receivers (3mm/s) will be achieved.

1.3 Receiver Review

The ORF is located within a rural landscape, approximately 13km north-west of Tamworth, NSW. Receivers in the locality surrounding the ORF are primarily rural/residential and primary production. The receiver addresses and MGA(56) coordinates for the nearest affected receivers to the project are summarised in **Table 1**. **Figure 1** provides a locality plan identifying the position of receivers in relation to the project. It is noted that TRC1 is owned by TRC, notwithstanding, TRC1 has been included in this assessment for completeness.

Table 1 Receivers and MGA Coordinates

Ref	Address	Easting	Northing
TRC1[1]	284 Gidley-Appleby Road	294350	6570872
R1	348 Gidley-Appleby Road	294797	6570971
R2	306 Gidley-Appleby Road	294613	6569976
R3	180 Gidley-Appleby Road	293711	6569503
R4	279 Gidley-Appleby Road	292755	6570347
R5	315 Gidley-Appleby Road	292717	6570775
R6	372 Gidley-Appleby Road	292794	6571472
R7	372 Gidley-Appleby Road	292807	6571626
R8	772 Appleby Lane	293748	6572218
R9	"Oakleigh" Appleby Lane	294730	6571816
R10	87 Wallamore Road	294884	6571387
C1[2]	Poultry Facility – 372 Gidley-Appleby Road	293718	6571176

Note 1: Owned by TRC.

Note 2: Neighbouring Poultry Facility – coordinates to nearest poultry shed.

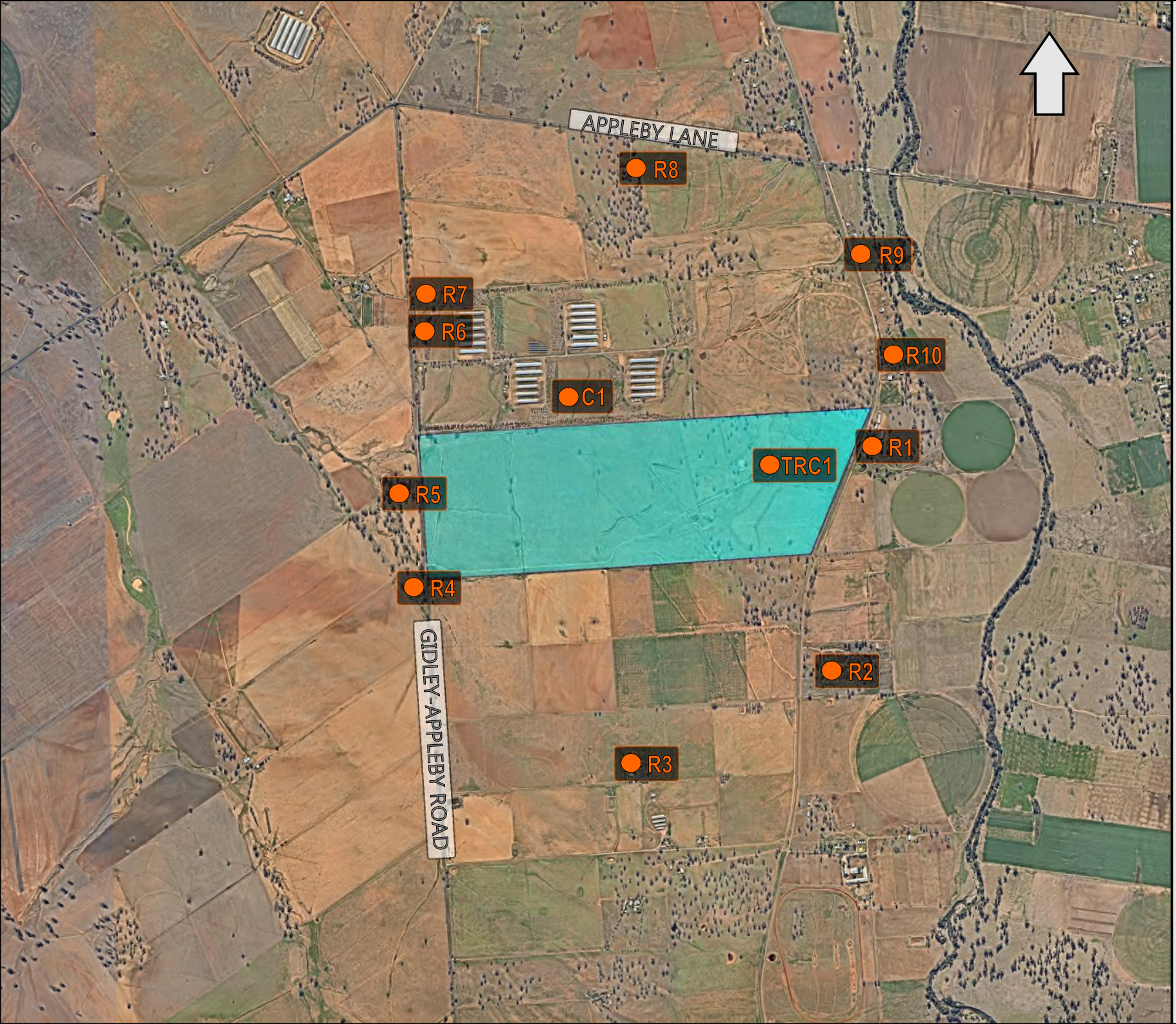

FIGURE 1

LOCALITY PLAN

REF: MAC160296

0 500m

KEY

R1 RECEIVER LOCATION

PROJECT SITE

MAC Muller Acoustic Consulting

*Imagery Source : nearmaps

2 Policy and Guidelines

The following section summarises relevant policy and guidelines pertinent to undertaking an industrial noise assessment. Key policies relevant to the ORF include the NPI, ICNG and RNP.

2.1 Noise Policy for Industry

The EPA released the Noise Policy for Industry (NPI) in October 2017 which provides a process for establishing noise criteria for consents and licenses enabling the EPA to regulate noise emissions from scheduled premises under the Protection of the Environment Operations Act 1997. The objectives of the NPI are to:

- provide noise criteria that is used to assess the change in both short term and long-term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, taking into account the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The policy sets out a process for industrial noise management involving the following key steps:

1. Determine the Project Noise Trigger Levels (PNTLs) (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.
2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.
3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.

4. Consider residual noise impacts - that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.

6. Monitor and report environmental noise levels from the development.

2.1.1 Project Noise Trigger Levels

The policy sets out the procedure to determine the PNTLs relevant to an industrial development. The PNTL is the lower (ie, the more stringent) value of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

2.1.2 Project Intrusiveness Noise Level (PINL)

The PINL ($LA_{eq(15min)}$) is the RBL[1] + 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment. Hence, when assessing intrusiveness, background noise levels need to be determined.

For low noise environments, such as rural environments, minimum assumed RBLs apply within the NPI and can be adopted in lieu of completing background noise measurements. This is considered the most conservative method for establishing noise criteria for a project. These result in minimum intrusiveness noise levels as follows:

- Minimum Day RBL = 35dBA;
- Minimum Evening RBL = 30dBA; and
- Minimum Night RBL = 30dBA.

Due to the rural nature of the locality, the PINLs for the project have been determined based on the minimum RBL+5dBA.

[1] Rating Background Level

2.1.3 Project Amenity Noise Level (PANL)

The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended amenity noise levels specified in Table 2.2 (of the NPI). The NPI defines two categories of amenity noise levels:

- **Amenity Noise Levels (ANL)** – are determined considering all current and future industrial noise within a receiver area.
- **Project Amenity Noise Levels (PANL)** – is the recommended levels for a receiver area, specifically focusing the project being assessed.

Additionally, Section 2.4 of the NPI states: "*to ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows*":

- areas with high traffic noise levels;
- proposed developments in major industrial clusters;
- existing industrial noise and cumulative industrial noise effects; and
- greenfield sites.

Furthermore, where the PANL is applicable and can be satisfied, the assessment of cumulative industrial noise is not required.

The recommended amenity noise levels as per Table 2.2 of the NPI are reproduced in **Table 2.**

Table 2 Amenity Criteria

Receiver Type	Noise Amenity Area	Time of day	Recommended amenity noise level dB $LA_{eq(period)}$
Residence	Rural	Day	50
		Evening	45
		Night	40

Notes: The recommended amenity noise levels refer only to noise from industrial noise sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as rural residential; suburban residential; urban residential; industrial interface; commercial; industrial – see Table 2.3 and Section 2.7.

Time of day is defined as follows: (These periods may be varied where appropriate, for example, see A3 in Fact Sheet A.)

- day – the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays.
- evening – the period from 6pm to 10pm.
- night – the remaining periods.

2.2 Maximum Noise Level Assessment

The potential for sleep disturbance from maximum noise level events from a project during the night-time period needs to be considered. The NPI considers sleep disturbance to be both awakenings and disturbance to sleep stages.

Where night-time noise levels from a development/premises at a residential location exceed:

- $L_{Aeq(15min)}$ 40dBA or the prevailing RBL plus 5dB, whichever is the greater, and/or
- L_{Amax} 52dBA or the prevailing RBL plus 15dB, whichever is the greater,

a detailed maximum noise level event assessment should be undertaken.

Where a detailed assessment is required, the assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the impacts on sleep disturbance include:

- how often the events would occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the development;
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods); and
- current understanding of effects of maximum noise level events at night.

2.3 Interim Construction Noise Guideline

The assessment and management of noise from construction work is completed with reference to the Interim Construction Noise Guideline (ICNG). The ICNG is specifically aimed at managing noise from construction work regulated by the EPA and is used to assist in setting statutory conditions in licences or other regulatory instruments. The types of construction regulated by the EPA under the POEO Act (1997), include construction, maintenance and renewal activities carried out by a public authority, such as road upgrades as described in Schedule 1 of the POEO Act.

The ICNG provides two methodologies for the assessment of construction noise emissions:

- Quantitative, which is suited to major construction projects with typical durations of more than three weeks; or
- Qualitative, which is suited to short term infrastructure maintenance (for projects with a typical duration of less than three weeks).

Due to the nature of the proposed works, the quantitative method has been applied in this assessment. The quantitative method includes identification of potentially affected receptors, description of activities involved in the project, derivation of the construction noise management levels, quantification of potential noise impact at receptors and, provides management and mitigation recommendations.

2.3.1 Standard Hours for Construction

Table 3 summarises the ICNG recommended standard hours for construction activities where the noise from construction is audible at residential premises.

Table 3 Recommended Standard Hours for Construction

Period	Preferred Construction Hours
Day (Standard construction hours)	Monday to Friday - 7am to 6pm Saturdays - 8am to 1pm (only if required) Sundays or Public Holidays - No construction

The recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm. Work conducted outside of standard hours are considered out of hours work (OOH). OOH periods are divided into two categories representing evening and night periods and cover the hours listed below:

Period 1 (evening/low risk period): Monday to Friday – 6pm to 10pm, Saturdays – 1pm to 6pm, Sundays – 8am to 6pm.

Period 2 (night/medium to high risk period): Monday to Friday – 10pm to 7am, Saturdays/Sundays – 6pm to 7am (8am on Sunday mornings).

Construction activities will generally be completed from Monday to Friday, with works on Saturday only as required. There is no out of hours construction work proposed for this project.

2.3.2 Construction Noise Management Levels

Table 4 reproduces the ICNG management levels for residential receivers. The construction noise management levels are the sum of the management level and relevant rating background level (RBL) for each specific assessment period.

Table 4 Noise Management Levels

Time of Day	Management Level $LA_{eq,15min}$ [1]	How to Apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays.	Noise affected RBL + 10dB.	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA.	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5dB.	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Note 1: The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the construction noise management levels for noise assessment purposes and is the median of the ABL's.

2.4 Road Noise Policy

The road traffic noise criteria are provided in the Road Noise Policy (RNP) (DECCW, 2011). The policy sets out noise criteria applicable to different road classifications for quantifying traffic noise impacts. Road noise criteria relevant to this assessment are presented in detail in **Section 3**.

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3 Assessment Criteria

3.1 Project Intrusiveness Noise Levels

The PINLs for the project are presented in **Table 5** and have been determined based on the RBL +5dBA.

Table 5 Intrusiveness Noise Levels

Receiver Type	Period[1]	Adopted RBL[2] dB LA_{90}	PINL dB $LA_{eq(15min)}$
Residential	Day	35	40
	Evening	30	35
	Night	30	35

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Minimum RBLs adopted.

3.2 Project Amenity Noise Levels

The PANLs for residential receivers potentially affected by the project are presented in **Table 6.**

Table 6 Project Amenity Noise Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	Recommended ANL dB $LA_{eq(period)}$[2]	PANL dB $LA_{eq(period)}$[3]	PANL dB $LA_{eq(15min)}$[4]
Residential Receivers	Rural	Day	50	45	48
		Evening	45	40	43
		Night	40	35	38
Commercial	Commercial	When in Use	65	60	63

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Recommended amenity noise levels as per Table 2.2 of the NPI.

Note 3: Includes a -5dB adjustment to account for the presence of existing industrial noise.

Note 4: Includes a +3dB adjustment to the amenity period level to convert to a 15-minute assessment period as per Section 2.2 of the NPI.

3.2.1 Project Noise Trigger Levels

The PNTLs are the lower of either the PINL or the PANL. **Table 7** presents the derivation of the PNTL in accordance with the methodologies outlined in the NPI.

Table 7 Project Noise Trigger Levels, dB $LA_{eq(15min)}$ (re 20uPa)

Receiver Location	Period	RBL	PINL dB $LA_{eq(15min)}$	PANL dB $LA_{eq(15min)}$	PNTL dB $LA_{eq(15min)}$
TRC1 & R1 to R15	Day	35	40	48	**40**
	Evening	30	35	43	**35**
	Night	30	35	38	**35**
C1	All – when in use	N/A	N/A	63	**63**

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

3.3 Maximum Noise Level Criterion

The maximum noise level screening criteria shown in **Table 8** is based on night time RBLs and trigger values as per Section 2.5 of the NPI.

Table 8 Maximum Noise Level Assessment Screening Criteria

Residential Receivers			
$LA_{eq(15min)}$		LA_{max}	
40dB $LA_{eq(15min)}$ or RBL + 5dB		52dB LA_{max} or RBL + 15dB	
Trigger	40	Trigger	52
RBL 30+5dB	35	RBL 30+15dB	45
Highest	**40**	**Highest**	**52**

Note 1: As per Section 2.5 of the NPI, the highest of each metric are adopted as the screening criteria.

3.4 Construction Noise Management Levels (NMLs)

Construction activities within the project site include site establishment, intersection upgrade works to the site from Gidley-Appleby Road, internal access roads, construction of receivals shed and associated structures, site office, amenities, hardstand areas/maturation pad and leachate dams that will be used as part of the overall project site.

As per the ICNG, this assessment has adopted a construction noise management level (NML) for residential receivers of 35dBA RBL + 10dB = 45dB $LA_{eq(15min)}$. For C1 (adjacent poultry facility) the commercial receiver NML of 70dBA was adopted in accordance with the ICNG.

3.5 Road Traffic Noise Criteria

The road traffic noise criteria are provided in the NSW EPA's Road Noise Policy (RNP) (2011). Section 2.2.2 of the RNP refers to 'Principal Haulage Routes' and states the following:

> *'Some industries such as mines and extractive industries are, by necessity, in locations that are often not served by arterial roads. Heavy vehicles must be able to access these often more remote sites and this may mean travelling on local public roads. Good planning practice acknowledges this type of road use and develops ways of managing any associated adverse noise impacts. Principal haulage routes are distinct from private haul roads – further guidance on private haul roads is provided in Appendix C4.*
>
> *Where local authorities identify a 'principal haulage route', the noise criteria for the route should match those for arterial/sub-arterial roads, recognising that they carry a different level and mix of traffic to local roads.'*

Therefore, in accordance with the RNP, this assessment has adopted the 'Freeway/arterial/sub-arterial road' category for the designated inbound and outbound transport routes. Table 9 reproduces the road traffic noise assessment criteria reproduced from the RNP relevant for this road type.

Table 9 Road Traffic Noise Assessment Criteria for Residential Land Uses

Road category	Type of project/development	Assessment Criteria - dBA	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial/sub-arterial road	Existing residences affected by additional traffic on existing freeways/sub-arterial/roads generated by land use developments	60dBA LAeq(15hr)	55dBA LAeq(9hr)

Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2dB, which is generally accepted as the threshold of perceptibility to a change in noise level.

3.5.1 Relative Increase Criteria

In addition to meeting the assessment criteria, any significant increase in total traffic noise at receivers must be considered. Receivers experiencing increases in total traffic noise levels above those presented in **Table 10** due to the addition of project vehicles on a local road network should be considered for mitigation.

Table 10 Increase Criteria for Residential Land Uses

Road Category	Type of Project/Development	Total Traffic Noise Level Increase, dBA	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road.	Existing traffic LAeq(15hr) +12dB (external)	Existing traffic LAeq(9hr) +12dB (external)

4 Noise Assessment Methodology

4.1 Operational Noise Modelling Methodology

A computer model was developed to determine the impact of Site noise emissions to neighbouring receivers for a typical operational scenario. iNoise (Version 2019.1) noise modelling software was used to assess potential noise impacts associated with the Site. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process.

Additionally, the model uses relevant noise source data, ground type, shielding such as barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Plant and equipment were modelled at various locations within representative positions of the future ORF (see **Appendix B**).

The model calculation method used to predict noise levels was in accordance with ISO 9613-1 'Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere' and ISO 9613-2 'Acoustics - Attenuation of sound during propagation outdoors. Part 2: General method of calculation'.

4.2 Operational Noise Modelling Parameters

The model incorporated three-dimensional digitised ground contours for the fixed plant and surrounding area, as derived from proposed Site plans superimposed onto the surrounding land base topography. Where relevant, modifying factors in accordance with Fact Sheet C of the NPI have been applied to calculations.

4.2.1 Meteorological Analysis

Noise emissions from industry can be significantly affected by prevailing weather conditions. Wind has the potential to increase noise at a receiver when it is at low velocities and travels from the direction of the noise source. As the strength of the wind increases, the noise produced by the wind will mask the audibility of most industrial sources.

Meteorological conditions that enhance received noise levels include source to receiver winds and the presence of temperature inversions. To account for potential enhancements, the NPI specifies that the source to the receiver wind component speeds up to 3m/s for 30% or more of the time in any seasonal period (i.e. day, evening or night), is considered to be a feature wind and predictions must incorporate these conditions.

To determine the prevailing conditions for the ORF, weather data was obtained from the Bureau of Meteorology's (BOM) Tamworth Airport weather station (2014 to 2016). The data was analysed using the EPA's Noise Enhancement Wind Analysis (NEWA) program to determine the frequency of occurrence of winds of speeds up to 3m/s in each season.

Table 11 summarises the results of the wind analysis and includes the dominant wind directions and percentage occurrence for each season for the daytime, evening and night assessment periods (ie 'prevailing winds'). The prevailing winds (in bold) will be adopted as part of the noise modelling scenarios for the project. **Appendix C** presents a summary of the analysed NEWA data.

Table 11 Seasonal Wind Speed, Direction and Percentage Occurrence

Season	Wind Direction ±(45°)			% Wind Speeds 0.5 to 3 m/s		
	Day	Evening	Night	Day	Evening	Night
Summer	NW	NW	NW	12	11	28
Autumn	SE	NW	NW	17	17	**34**
Winter	ESE	NW	NW	19	21	**32**
Spring	ESE	NW	NW	15	13	**32**

Based on the results of this analysis, the relevant meteorological conditions adopted in the noise modelling assessment are summarised in **Table 12**.

Table 12 Modelled Prevailing Meteorological Parameters

Assessment Condition	Wind Speed/Direction	Stability Class
Calm (all periods)	n/a	n/a
Prevailing wind (night only)	3m/s/NW	n/a
Inversion (night only)	n/a	F

Note: Day period is 7am to 6pm, Evening is 6pm to 10pm, Night period is 10pm to 7am.

4.2.2 Modelling Scenarios - Operation

A worst-case modelling scenario was adopted in this assessment to represent noise emissions during maximum operations of the ORF with plant operating at representative positions within the Site boundary. Plant and equipment proposed to be used at the ORF were in accordance with plant listed in the Draft Conceptional Design report (PS, 2018). It is noted that operational noise sources associated with importation and loading of material at the ORF were assumed to operate during the day assessment period (ie 7am to 6pm). Pumps and fans associated with processing of recycled materials were assumed to operate 24/7 (ie, day, evening and night periods).

Traffic generation of the ORF are anticipated to generate up to 20 trucks (40 truck movements) in a peak hour which are comprised of a combination of truck types including, kerbside, collection vehicles, dual axle tippers, semi-trailers, truck and dogs and B-doubles (Traffic Impact Assessment, PS, 2019).

Noise emission data for relevant ORF sources were obtained from the MAC noise database. The noise emission levels used in modelling are summarised in **Table 13**. **Appendix D** provides the octave sound power data of modelled plant.

Table 13 Equipment Sound Power Levels - Operation

Item	dB $LA_{eq(15min)}$ Sound Power Level (SWL)	Period of Operation		
Operational Noise Sources		**Day**	**Evening**	**Night**
Front End Loader (x2)	104	✓	X	X
Road Trucks (x3)	102	✓	X	X
Truck Idle (x1)	85	✓	X	X
Shredder (x1)	110	✓	X	X
Screen (x1)	109	✓	X	X
Tunnel Ventilation Fans (x7)	72	✓	✓	✓
Biofilter Fan (x1)	75	✓	✓	✓
Pumps (x3)	78	✓	✓	✓
Maximum Noise Sources (Sleep Disturbance), LA_{max}				
All Pumps and Fans (logarithmic sum)	85		Night Only	

Note: Day period is 7am to 6pm, Evening is 6pm to 10pm, Night period is 10pm to 7am.

4.2.3 Modelling Scenarios - Construction

A worst-case modelling scenario was adopted in this assessment to represent maximum noise emissions during construction activities at the ORF. It is noted that there are potentially multiple and varied plant items which may be used in the construction phase of this project. Notwithstanding, the adopted fleet sound power level is considered representative of construction activities for this type of project.

Emission data for relevant ORF construction noise sources were obtained from the MAC noise database. The noise emission levels used in modelling are summarised in **Table 14**.

Table 14 Equipment Sound Power Levels - Construction

Item	Sound Power Level (SWL) dB $LA_{eq(15min)}$	Period of Operation
Scraper/Grader (x1)	108	Day Only
Excavator (x1)	106	Day Only
Roller (x1)	108	Day Only
Road Truck (x1)	102	Day Only
Bobcat (x1)	103	Day Only
Water Cart (x1)	101	Day Only
Crane (x1)	95	Day Only
Elevated Work Platform (x2)	94	Day Only
Concrete Truck/Concrete Pump (x1)	96	Day Only
Pneumatic Hand tools	97	Day Only

5 Noise Modelling Results and Discussion

5.1 Operational Noise Results

The predicted noise levels at each receiver during calm and noise enhancing meteorological conditions for ORF operations are provided in **Table 15** and operation phase noise contours are provided in **Appendix E**. The results of the model show that noise emissions from the ORF will satisfy the PNTL at all assessed privately owned receivers for worst case operations.

Table 15 Predicted Operational Noise Levels, dBA $L_{Aeq(15min)}$

Receivers	Predicted Noise Levels				PNTL		
	Calm Meteorology			Worst Case Meteorology[1]			
	Day	Evening	Night	Night	Day	Evening	Night
Residential Receivers							
TRC1[2]	42	<20	<20	<20	40	35	35
R1	37	<20	<20	<20	40	35	35
R2	38	<20	<20	<20	40	35	35
R3	38	<20	<20	<20	40	35	35
R4	39	<20	<20	<20	40	35	35
R5	37	<20	<20	<20	40	35	35
R6	33	<20	<20	<20	40	35	35
R7	31	<20	<20	<20	40	35	35
R8	29	<20	<20	<20	40	35	35
R9	31	<20	<20	<20	40	35	35
R10	34	<20	<20	<20	40	35	35
Commercial Receivers							
C1		40[3]		<20		63	

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Based on inversion meteorological conditions or 3m/s NW winds, whichever is higher.

Note 2: Owned by TRC.

Note 3: When in use.

5.2 Sleep Disturbance Results

In assessing sleep disturbance, typical L_{Amax} noise levels from pumps and fans operating within the ORF were assessed to the nearest residential receivers. The use of the L_{Amax} noise level provides a worst-case prediction since the $L_{A1(1minute)}$ noise level of a noise event is likely to be less than the L_{Amax}. For the sleep disturbance assessment, a sound power level of 85dBA has been adopted and is representative of the maximum noise emissions associated with combined operation of all pumps and fans operating within the ORF.

Predicted noise levels from L_{Amax} events for assessed receivers are presented in **Table 16**. Results identify that sleep the disturbance criterion will be satisfied for all assessed receivers.

Table 16 Predicted Sleep Disturbance Noise Levels, dB L_{Amax}

Receiver	Predicted L_{Amax} noise level events[1]	Sleep Disturbance Noise Criterion
All Assessed Receivers	<20	52

Note 1: Includes assessment of noise emissions during adverse meteorological conditions.

5.3 Construction Noise Results

This assessment has quantified potential noise emissions from the proposed construction of intersection upgrade works, internal access roads, weighbridge and car parks, construction of an office, equipment shed and composting shed, and ancillary areas such as the hardstand and leachate dams that will be used as part of the overall project site. **Table 17** provides a summary of the construction noise emissions for the project, bold font indicates levels above the relevant NML.

Table 17 Predicted Noise Levels from Construction, dBA $L_{Aeq(15min)}$						
Receivers	Construction Scenario					NML
	Site Establishment	Intersection Upgrade	Internal Access Roads	Bulk Earth Works	Building Works	
Residential Receivers						
TRC1[2]	40	29	42	47	47	45
R1	33	25	35	39	42	45
R2	35	26	34	39	42	45
R3	36	30	34	37	42	45
R4	37	**51**	**49**	37	42	45
R5	36	**50**	**48**	37	42	45
R6	32	36	37	35	40	45
R7	31	34	35	35	39	45
R8	28	26	31	33	37	45
R9	28	23	31	34	37	45
R10	30	24	33	36	39	45
Commercial Receivers						
C1	41	33	44	47	48	70

The results of the model indicate that the intersection upgrade works and the construction of internal access roads would likely exceed the noise affected Noise Management Level (NML) of 45dBA at residential receiver locations R4 and R5, when the works are located in close proximity to Gidley-Appleby Road. As the construction of the internal access roads progress towards the east (further from R4 and R5), the noise levels at these receiver locations will lesson. At approximately 250m to the east of the proposed intersection location, the modelled noise levels for the construction of the internal access roads are demonstrated to comply with the NML. Notwithstanding, noise control measures summarised in **Section 6** should be considered for the Site.

The construction works are demonstrated to comply with the highly noise affected NML of 75dBA at all receiver locations under all construction scenarios.

5.4 Traffic Noise Results

The United States (US) Environment Protection Agency's road traffic calculation method was used to predict the L_{Aeq} noise levels from site trucks travelling past receivers along public roads. This method is an internationally accepted theoretical traffic noise prediction model and is ideal for calculating road traffic noise where relatively small traffic flows are encountered.

5.4.1 Operational Road Noise

The majority of truck movements to the site are received from the south, with approximately 60% inbound via Wallamore Road - Gidley Siding Road – Gidley-Appleby Road, 30% inbound via Oxley Highway - Appleby Lane – Gidley-Appleby Road and 10% inbound via Manilla Road – Appleby Lane – Gidley-Appleby Road.

Outbound traffic is restricted to right turns onto Gidley-Appleby Road utilising Appleby Lane to access the Oxley Highway (60%) and Manilla Road (40%).

For this assessment, the maximum proposed daily truck movements associated with garbage trucks (incoming waste) and B-Doubles (outgoing compost) is estimated that 20 trucks in a peak hour may visit the project site (ie 40 movements) during maximum production of the ORF (PS, 2019). This assessment has assumed that truck volumes equivalent of up to three peak hourly periods (ie 120 movements) occur within a single day, which is a maximum worst case scenario.

The nearest residences to the project site haul route are situated on Wallamore Road and Manilla Road at a near offset distance of approximately 20m. The nearest residences to the Oxley Highway are located within the town of Westdale approximately 25m from the closest travel lane.

The results of the traffic noise calculations are presented in Table 18 and demonstrate that noise levels from ORF vehicles would remain below the relevant day criteria for receivers adjacent to Wallamore Road and Manilla Road. Road traffic noise levels for receivers adjacent to the Oxley Highway are predicted to exceed the day criteria, however, it is noted that existing road traffic noise levels also exceed the relevant criteria.

In circumstances where existing noise levels already exceed the criteria, the RNP states that any additional increase in total traffic noise levels should be limited to 2dB. The increase in operational road traffic noise levels is predicted to be 0.1dB above the existing levels, therefore, within the allowable increase as per the RNP.

Table 18 Operational Road Traffic Noise Levels					
Road ID	Distance to Nearest Receiver (m)	Assessment Criteria	Existing Traffic[1]	Future Project Traffic Noise[2]	Existing + Future Project Combined
			Day $LA_{eq(15hr)}$, dBA		
Wallamore Road	20	60	49.2	53.9	55.2
Oxley Highway	25	60	63.7	53.9	63.8
Manilla Road	20	60	58.1	52.2	59.1

Note 1: Existing road noise calculations derived using traffic volumes obtained from counting station on Manilla Road (Station ID92187) and Oxley Highway (Station ID6168) (Roads and Maritime, 2007).

Note 2: Calculated value assuming percentage of maximum truck movements per day as per TIA.

5.4.2 Construction Road Noise

The Traffic Impact Assessment (PS, 2019) states that during construction, the ORF project will generate up to 40 delivery trucks movements per day and up to 50 staff vehicle movements per day. This assessment has quantified construction road noise levels at a 20m offset to residences on Manilla Road which are the closest potentially impacted residences adjacent to the project construction travel route. **Table 19** presents the results of the construction road noise assessment. Road noise calculations identify that traffic noise emissions associated with construction will remain below the relevant criteria.

Table 19 Construction Road Traffic Noise Levels				
Distance to Nearest Receiver (m)	Assessment Criteria	Existing Traffic[1]	Future Project Traffic Noise[2]	Existing + Future Project Combined
		Day $LA_{eq(15hr)}$, dBA		
20	60	58.1	54.4	59.7

Note 1: Existing road noise calculations derived using traffic volumes obtained from counting station on Manilla Road (Station ID92187, Roads and Maritime, 2007).

Note 2: Calculated value assuming 40 truck movements and 50 staff vehicle movements per day.

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6 Recommendations

6.1 Noise Recommendations (Operational)

Noise predictions identify that compliance with relevant noise criteria is achievable. Notwithstanding, it is recommended that the ORF prepare a Noise Management Plan (NMP) to manage noise emissions from the project. The management plan will be prepared with the purpose of providing a description of the measures to be implemented by the ORF to mitigate noise impacts and detail noise monitoring requirements associated with site operations, construction or maintenance.

In general, the purpose of the NMP is to:

- provide the ORF employees and contractors with a description of their responsibilities regarding the management of noise emissions from site;
- address any relevant conditions/requirements of consent/approval;
- describe the methodologies adopted to monitor noise emissions from the site against relevant criteria;
- provide a mechanism for assessing noise monitoring results against the relevant noise criteria; and
- provide a means for the establishment of best practice management with respect to minimising noise emissions/impacts to the broader community.

6.2 Construction Noise Recommendations

In addition to the NMP, it is recommended that during construction the contractor consider implementing the following ameliorative/management measures to reduce noise emissions within the surrounding community.

- implement boundary fences/retaining walls as early as possible to maximise their attenuation benefits to surrounding receivers;
- toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to the community;
- where possible use mobile screens or construction hording to act as barriers between construction works and receivers;
- all plant should be shut down when not in use. Plant to be parked/started at farthest point from relevant assessment locations;
- operating plant in a conservative manner (no over-revving);

- signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site;
- selection of the quietest suitable machinery available for each activity;
- avoidance of noisy plant/machinery working simultaneously where practicable;
- minimisation of metallic impact noise;
- all plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm; and
- undertake letter box drops to notify receivers of potential works.

7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has conducted a Noise and Vibration Impact Assessment (NVIA) for the proposed Organics Recycling Facility (ORF) to be established in Gidley, north west of Tamworth NSW.

The assessment has quantified potential operational noise emissions pertaining to receival, processing, and off-site transportation. The results of the NVIA demonstrate that operational noise levels comply with the relevant NPI criteria at all privately owned receivers during calm and prevailing meteorological conditions. It is noted that exceedances of the relevant operational noise criteria are predicted at assessment location TRC1, although this residence is owned by TRC.

Furthermore, sleep disturbance is not anticipated, as emissions from transient noise events are predicted to remain below the EPA screening criterion for sleep disturbance.

Results identify that noise levels from the proposed construction works at the ORF are demonstrated to satisfy the standard hours construction NMLs at all assessed receivers for site establishment, bulk earthworks and building works. Intersection upgrade works and the construction of internal access roads within 250m of the intersection with Gidley-Appleby Road are predicted to exceed the noise affected NML of 45dBA at receivers R4 and R5. The highly noise affected NML of 75dBA would be satisfied at all assessed receiver locations for all construction scenarios. Notwithstanding, noise control measures are provided in Section 6 of this report to manage emissions within the community surrounding the Site.

Off-site road noise emissions from product transport are predicted to satisfy relevant day road noise criteria and relative increase criteria specified in the RNP for operation and construction of the ORF.

Based on the NVIA modelling results which considers the current design and layout of the project, compliance with the relevant EPA and sleep disturbance policies is expected. Notwithstanding, recommendations are provided to further minimise noise emissions from the project. These recommendations include preparation of a Noise Management Plan and generic noise control and management techniques that may be adopted during construction to minimise noise impacts from site to the surrounding community.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in Table A1.

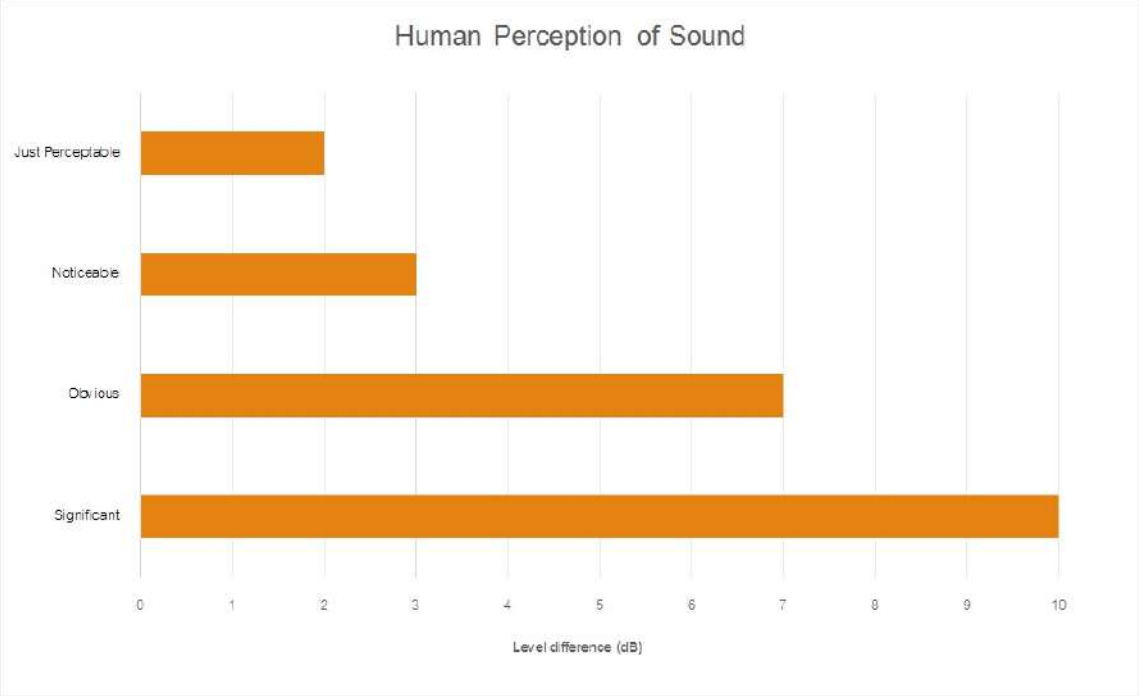
Table A1 Glossary of Terms

Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by: = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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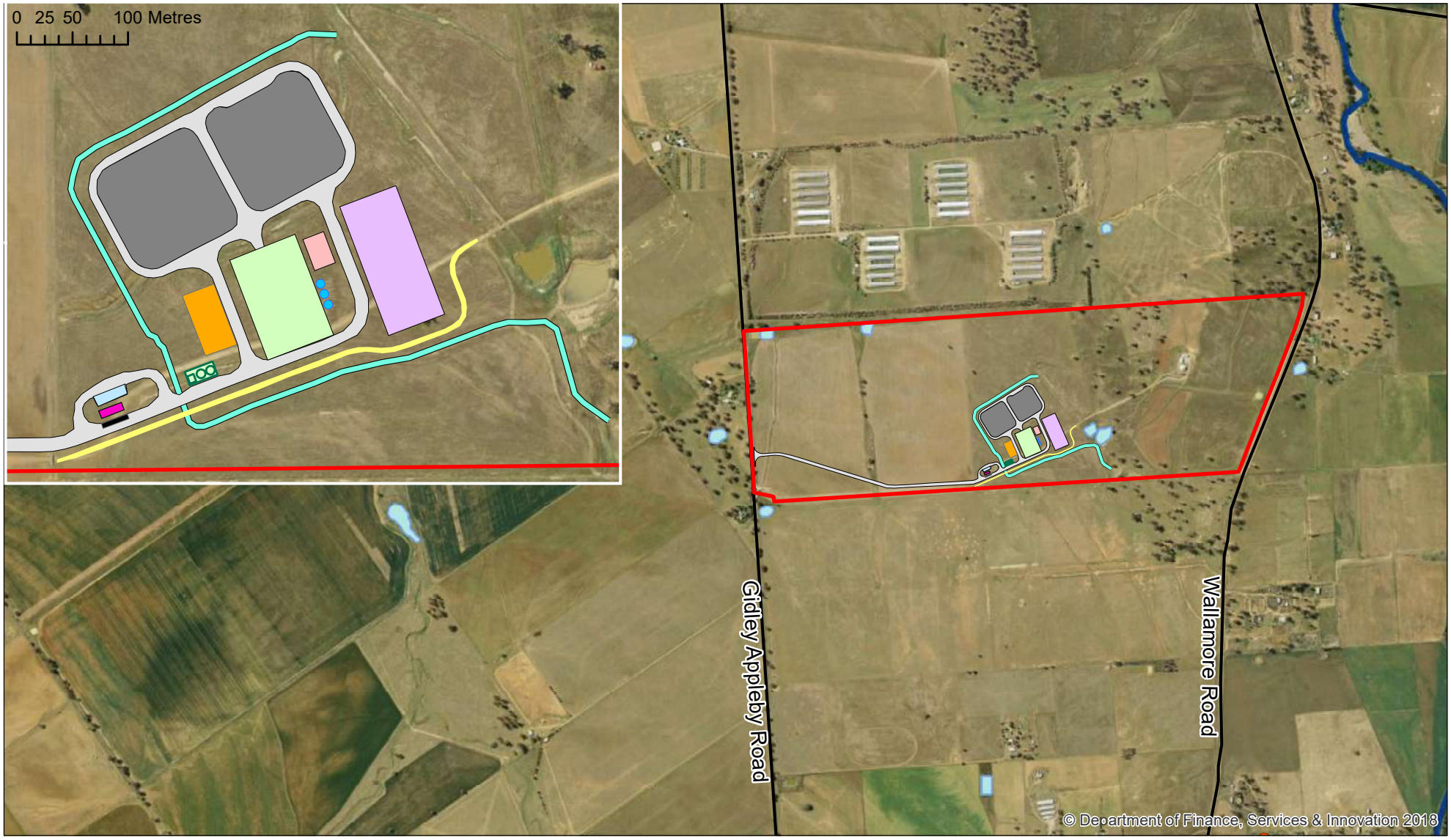
Appendix B – Plant Equipment Locations



Tamworth Regional Council

Site Map

pitt&sherry

N

0 0.1250.25 0.5 Kilometers

Coordinate System: GDA 1994 MGA Zone 56
1:20,000 When Printed at A4

MAP REF	SY19089
REVISION	A
AUTHOR	eparry
DATE	27/08/2019
DATA SOURCES	Base map from SixMaps

Legend

- Site boundary
- Internal roads
- Maturation pad
- Receivals & processing shed
- Equipment shed
- Biofilter
- Carpark
- Access track
- Fire pump and tanks
- Leachate Pond
- Office
- Weighbridge
- Water tanks
- Batters
- Roads

Appendix C – NEWA Meteorology

Analysis Summary

Table C1 NEWA Analysed Meteorological Conditions, Tamworth Airport, NSW									
Direction	Season	Day	Evening	Night	Direction	Season	Day	Evening	Night
		Percentage Occurrence %					Percentage Occurrence %		
0	Summer	8	9	22	180	Summer	9	6	4
0	Autumn	12	14	29	180	Autumn	13	10	7
0	Winter	13	17	27	180	Winter	13	13	10
0	Spring	9	12	27	180	Spring	12	9	7
22.5	Summer	8	8	19	202.5	Summer	9	7	4
22.5	Autumn	12	12	25	202.5	Autumn	11	9	7
22.5	Winter	12	13	20	202.5	Winter	10	12	9
22.5	Spring	10	12	21	202.5	Spring	11	9	7
45	Summer	9	6	7	225	Summer	8	7	6
45	Autumn	13	8	9	225	Autumn	9	8	6
45	Winter	12	11	9	225	Winter	7	9	7
45	Spring	12	11	9	225	Spring	8	9	8
67.5	Summer	10	6	6	247.5	Summer	9	9	9
67.5	Autumn	15	8	6	247.5	Autumn	11	10	8
67.5	Winter	15	11	8	247.5	Winter	8	9	9
67.5	Spring	13	11	8	247.5	Spring	8	9	10
90	Summer	10	5	5	270	Summer	10	9	14
90	Autumn	15	8	5	270	Autumn	12	11	14
90	Winter	16	13	7	270	Winter	11	13	15
90	Spring	14	11	7	270	Spring	8	10	15
112.5	Summer	11	4	5	292.5	Summer	11	10	24
112.5	Autumn	17	9	5	292.5	Autumn	14	16	26
112.5	Winter	19	13	8	292.5	Winter	14	19	26
112.5	Spring	15	11	6	292.5	Spring	9	13	26
135	Summer	12	5	4	315	Summer	11	11	28
135	Autumn	17	9	5	315	Autumn	15	17	34
135	Winter	19	14	9	315	Winter	16	21	32
135	Spring	15	9	6	315	Spring	10	13	32
157.5	Summer	10	6	5	337.5	Summer	7	7	24
157.5	Autumn	14	10	7	337.5	Autumn	11	14	30
157.5	Winter	16	14	10	337.5	Winter	13	17	28
157.5	Spring	14	9	7	337.5	Spring	7	11	28

Appendix D – Octave SWL Data

Table D1 $LA_{eq(15min)}$, dBA Sound Power Level Spectrum

Noise Source	Octave Band Centre Frequency (Hz), dBA								Total
	63	125	250	500	1000	2000	4000	8000	dBA
Operational Plant									
Telehandler (x1)	72	82	87	89	90	90	83	74	96
Front End Loader (x1)	84	94	90	98	97	96	95	85	104
Road Trucks	89	95	90	89	93	97	92	85	102
Truck Idle	84	77	74	69	68	67	62	54	85
Shredder (x1)	86	94	98	103	105	104	100	93	110
Screen (x1)	79	88	89	101	103	104	100	90	109
Tunnel Ventilation Fans (x7)	48	56	66	69	63	61	53	38	72
Biofilter Fan (x1)	51	59	69	72	66	64	56	41	75
Pumps (x3)	54	62	72	75	69	67	59	44	78

Appendix E – Operational Noise Contours

Operation Phase Noise Contours - Day Period

Muller Acoustic Consulting Pty Ltd - Australia

Muller Acoustic Consulting Pty Ltd
PO Box 262, Newcastle NSW 2300
ABN: 36 602 225 132
P: +61 2 4920 1833
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MAC
Muller Acoustic Consulting

Traffic Impact Assessment

Appendix G

pitt&sherry

pitt&sherry

Tamworth Regional Council Organic Recycling Facility, Tamworth

Traffic Impact Assessment

Prepared for

Tamworth Regional Council

Client representative

Megan Mather

Date

23 September 2019

Rev 01

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Appendix A — Site Layout Plans
Appendix B — Existing Operation SIDRA Results
Appendix C — Swept Paths
Appendix D — Post Development SIDRA Results
Appendix E — Construction Operation SIDRA Results

Prepared by — Leenah Ali		**Date —** 23 September 2019
Reviewed by — Rebekah Ramm		**Date —** 23 September 2019
Authorised by — Ross Mannering		**Date —** 23 September 2019

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Traffic Impact Assessment	L Ali	R Ramm	R Mannering	14/08/2019
00	Traffic Impact Assessment	L Ali	R Ramm	R Mannering	20/08/2019
01	Traffic Impact Assessment – Including Internal Layout Assessment	L Ali	R Ramm	R Mannering	23/09/2019

1. Introduction

1.1 Background

Tamworth Regional Council's processing and composting of organic materials is currently restricted to green waste only at the Forest Road Waste Management Facility. The Forest Road Composting Facility is licensed with the Environment Protection Authority (EPA) and processes approximately 15,000 tonnes per annum of green waste. The current operational footprint of the Forest Road facility is limited and additional organic waste materials such as food organics are currently being landfilled.

In order to divert organic materials from being landfilled, Tamworth Regional Council is proposing to construct and operate an Organic Recycling Facility (ORF) located on Gidley Appleby Road in Gidley. The facility will service the greater Tamworth Region including the town of Tamworth and will be the first ORF suitable to process up to 35,000 tonnes per annum of a range of organic materials.

As this project is considered to be a Designated Development under the New South Wales (NSW) Planning Portal, it is subject to a Development Application (DA) to be determined by the Joint Regional Planning Panel. As part of the DA, an Environmental Impact Statement (EIS) is required.

As part of the EIS, Roads and Maritime Service (RMS) have requested that a Traffic Impact Assessment (TIA) be prepared.

1.2 Traffic Impact Assessment Scope

Tamworth Regional Council have engaged pitt&sherry to undertake a TIA for the construction and operation of the ORF.

This report has been prepared by a suitably qualified person in accordance with the *Austroads Guide to Traffic Management – Part 12 (2016)* and the *RMS Guide to Traffic Generating Developments (2002).*

2. Existing Conditions

2.1 Site Location

The site is located at 284 Gidley Appleby Road (Lot 61 DP 707563 in the Tamworth Local Government Area), Gidley, approximately 15km north-west of Tamworth's Town Centre. The site is bound by Gidley Appleby Road to the west and Wallamore Road to the east. The Oxley highway is located approximately 5km west of the site while Manilla Road is located approximately 2km east of the site.

The site was historically a hobby farm but is currently cleared land. The site has a land use classification as RU1 Primary Production under the *Tamworth Regional Local Environmental Plan 2010*. Surrounding properties comprise of farming operations.

Figure 1 shows the site in the local context.

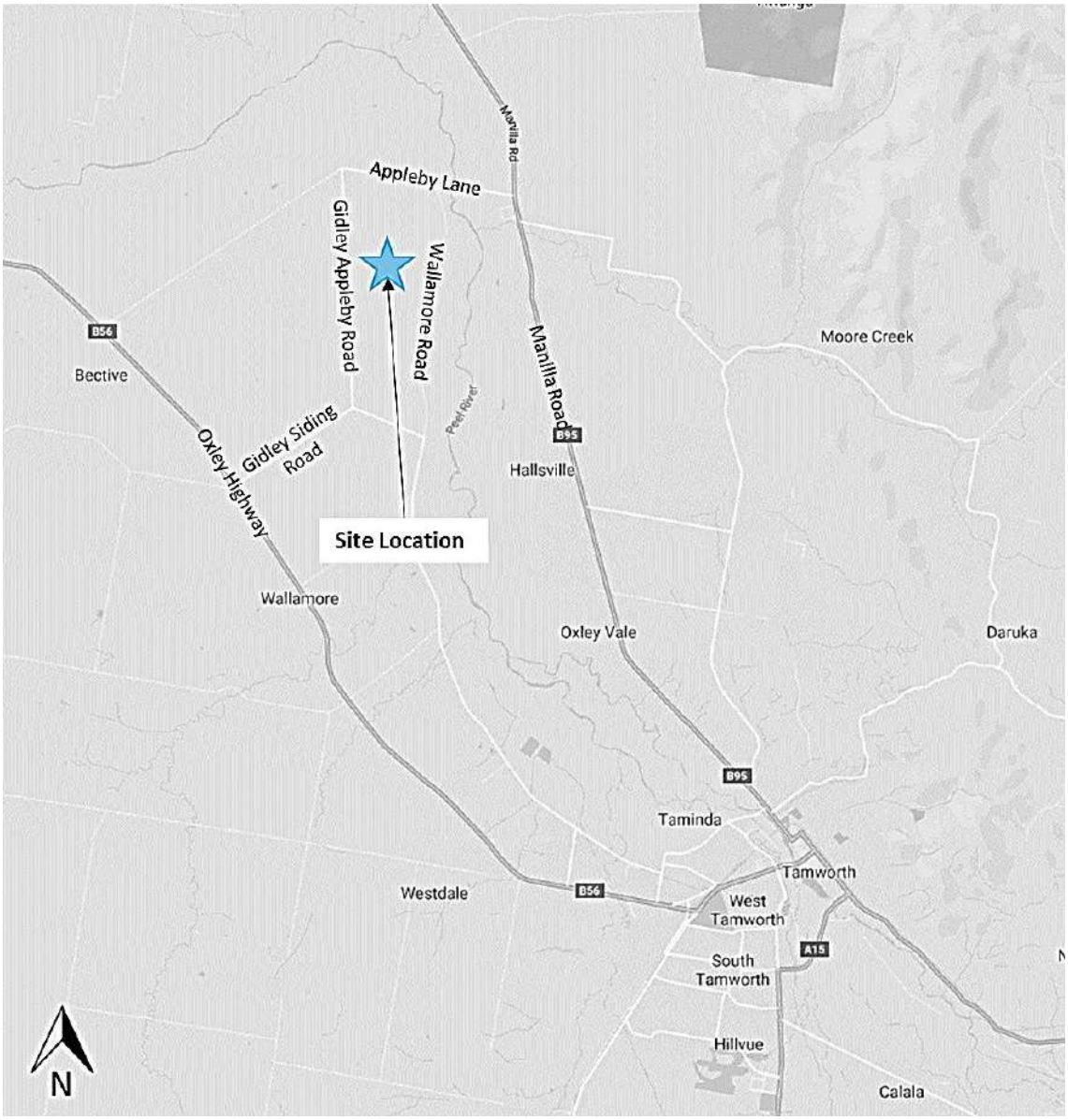


Figure 1: Site location (base map source: Google Maps, 2019)

2.2 Site Access

The site is currently accessed via a gravel driveway parallel to the southern boundary. This access is not suitable for use for the proposed facility.

Figure 2 shows the location of the site access with reference to the property boundary.

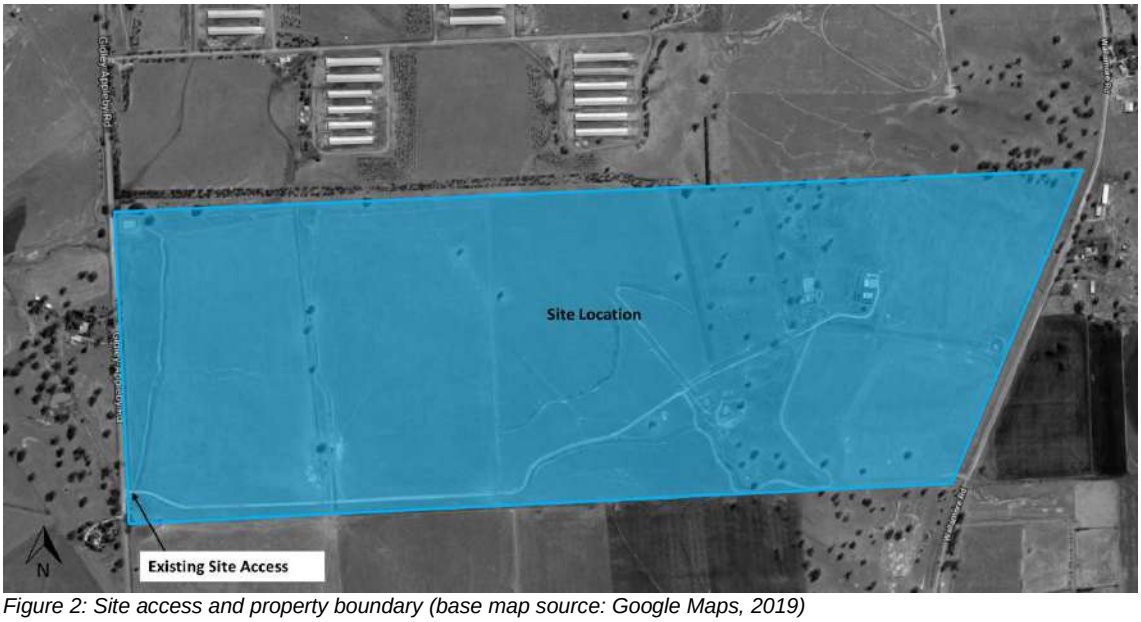


Figure 2: Site access and property boundary (base map source: Google Maps, 2019)

2.3 Surrounding Road Network

2.3.1 Overview

Gidley Siding Road, Gidley Appleby Road and Appleby Lane

Gidley Siding Road (shown in Figure 3 and Figure 4), Gidley Appleby Road (shown in Figure 5 and Figure 6) and Appleby Lane (shown in Figure 7 and Figure 8) are all Council owned local roads. Gidley Appleby Road operates in a north-south direction while Gidley Siding Road and Appleby Lane operate in an east-west direction. All three roads are subject to the default rural speed limit for sealed roads of 100 km/h.

Figure 3: Gidley Siding Road – facing east (Image Source: pitt&sherry, 2019)

Figure 4: Gidley Siding Road – facing west (Image Source: pitt&sherry, 2019)

Figure 5: Gidley Appleby Road – facing north (Image Source: pitt&sherry, 2019)

Figure 6: Gidley Appleby Road – facing south (Image Source: pitt&sherry, 2019)

Figure 7: Appleby Lane – facing east (Image Source: pitt&sherry, 2019)

Figure 8: Appleby Lane – facing west (Image Source: pitt&sherry, 2019)

Wallamore Road

Wallamore Road (shown in Figure 9 and Figure 10) is a Council owned road that operates between Tamworth and Appleby Lane in a north-south direction. Between Tamworth and the Wallamore Road/ Gidley Siding Road intersection, Wallamore Road is a sealed road with a single lane in each direction. To the north of the Wallamore Road/ Gidley Siding Road intersection, Wallamore Road continues as an unsealed road until its termination point at the Wallamore Road/ Appleby Lane intersection. Wallamore Road is a local road that is subject to the default speed limit of 100 km/h.

Figure 9: Wallamore Road – facing north (Image Source: pitt&sherry, 2019)

Figure 10: Wallamore Road – facing south (Image Source: pitt&sherry, 2019)

Manilla Road

Manilla Road (shown in Figure 11 and Figure 12) is a Council owned road operating between Tamworth and Barraba. In the vicinity of the site, Manilla Road operates in a north-south direction and is configured with a single lane in each direction with a dedicated right turn lane and left slip lane into Appleby Lane. A speed limit of 100km/h applies along Manilla Road in the vicinity of the site.

Figure 11: Manilla Road – facing north (Image Source: pitt&sherry, 2019)

Figure 12: Manilla Road – facing south (Image Source: pitt&sherry, 2019)

Oxley Highway

The Oxley Highway (shown in Figure 13 and Figure 14) is a RMS Classified State Road with a Highway Class. The highway connects Tamworth with other regional towns in New South Wales (NSW) including Port Macquarie to the east and Gunnedah to the west. In the vicinity of the site, the Oxley Highway travels in a northwest-southeast direction and is configured with a single lane in each direction. A speed limit of 100km/h applies along the Oxley Highway in the vicinity of the site.

Figure 13: Oxley Highway – facing north-west (Image Source: pitt&sherry, 2019)

Figure 14: Oxley Highway – facing south-east (Image Source: pitt&sherry, 2019)

2.3.2 Road Widths

The road widths along each of the roads surrounding the site have been measured. The road width was observed to vary along sections and therefore in sections with varying road widths, the minimum (or worst case) road width was adopted. Road widths measured are detailed in Table 1. The shoulder widths were measured to be equivalent to 1.5m or greater on all roads.

Table 1: Measured road widths (data source: pitt&sherry, 2019)

Road Name	Location	Minimum Measured Sealed Lane Width
Gidley Siding Road	West of intersection with Wallamore Road	3.5m
Gidley Appleby Road	South of intersection with Appleby Lane and Evans Lane	3.6m
Appleby Lane	West of intersection with Gidley Appleby Road	3.5m
Wallamore Road	South of intersection with Gidley Siding Road	3.5m
Manilla Road	North of intersection with Appleby Lane	4.3m
Oxley Highway	North of intersection with Appleby Lane	3.5m

2.3.3 Surrounding Intersections

The following intersections are located close to the site:

- Oxley Highway/ Appleby Lane (give-way T-intersection)
- Manilla Road/ Appleby Lane (give-way T-intersection)
- Gidley Appleby Road/ Appleby Lane/ Evans Lane (give-way 4-leg intersection)
- Gidley Siding Road/ Gidley Appleby Road (give-way T-intersection); and
- Wallamore Road/ Gidley Siding Road (give-way T-intersection).

2.4 Road Safety

2.4.1 Crash Data

The NSW Government *Transport for NSW Centre for Road Safety* have an interactive crash map that records all crash information in NSW. The crash history data for the most recent five-year period in the vicinity of the site has been obtained from the crash map. The crash history is summarised in Table 2.

Table 2: Crash history summary (data source: Transport for NSW, 2019)

Location	Road User Movement (RUM) Description	Severity
Gidley Appleby Road	70 – Off road left	Fatal
Appleby Lane/ Manilla Road intersection	53 – Overtaking turning vehicle	Moderate injury
Appleby Lane/ Wallamore Road	32 – Right Rear	Serious injury

Based on the crash history above, three crashes have occurred in the vicinity of the site in the most recent 5-year period. All three crashes occurred in different locations and were different crash types. Based on this, there does not appear to be any crash patterns in the vicinity of the site and the three crashes are considered to be isolated incidents.

2.4.2 Sight Distances

The Safe Intersection Sight Distance (SISD) has been assessed for vehicles at the following intersections:

- Oxley Highway/ Appleby Lane – sight distance to vehicles on the Oxley Highway
- Manilla Road/ Appleby Lane – sight distance to vehicles on Manilla Road
- Gidley Appleby Road/ Appleby Lane/ Evans Lane – sight distance to vehicles on Appleby Lane
- Gidley Siding Road/ Gidley Appleby Lane – sight distance to vehicles on Gidley Appleby Road
- Wallamore Road/ Gidley Siding Road – sight distance to vehicles on Gidley Siding Road; and
- Site Access/ Gidley Appleby Road – sight distance to vehicles on Gidley Appleby Road.

The SISD has been assessed against the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (2017)*. The SISD has been measured from a point 5m back from the edge of the major road at each intersection, in accordance with Figure 3.2 of the Austroads Guide.

As discussed, the speed limit on all roads is 100km/h. The SISD requirements for a 100km/h road (with a conservative reaction time of 2.5 seconds) is 262m. The observed sight distance from each intersection was greater than 300m in both directions. As such, the available sight distance at all intersections exceeds the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (2017)* sight distance requirements.

2.5 Traffic Volumes

Vehicle turning movement counts were undertaken by Matrix Traffic and Transport Data on Tuesday 14 May 2019 at the following intersections:

- Oxley Highway/ Appleby Lane
- Manilla Road/ Appleby Lane; and
- Gidley Appleby Road/ Appleby Lane/ Evans Lane.

Counts were undertaken during the AM peak period (8:00am – 9:30am) and the PM peak period (3:00pm – 4:30pm). It was determined from the survey data that the network AM peak hour occurs between 8:00am and 9:00am and the PM peak hour occurs between 3:30pm and 4:30pm.

In addition to the above turning movement counts, pitt&sherry staff undertook turning movement counts during the AM and PM peak on Thursday 1 August 2019 at the following intersections:

- Gidley Siding Road/ Gidley Appleby Road; and
- Wallamore Road/ Gidley Siding Road.

It is noted that in addition to the turning movement counts, traffic tube counters were also placed along Gidley Siding Road between Saturday 10 August 2019 and Saturday 16 August 2019. The traffic data collected from the tube counters were used to validate the traffic movement counts undertaken by Matrix Traffic and Transport Data and pitt&sherry staff.

A summary of the existing AM and PM peak hour traffic volumes are shown in Figure 15 and Figure 16.

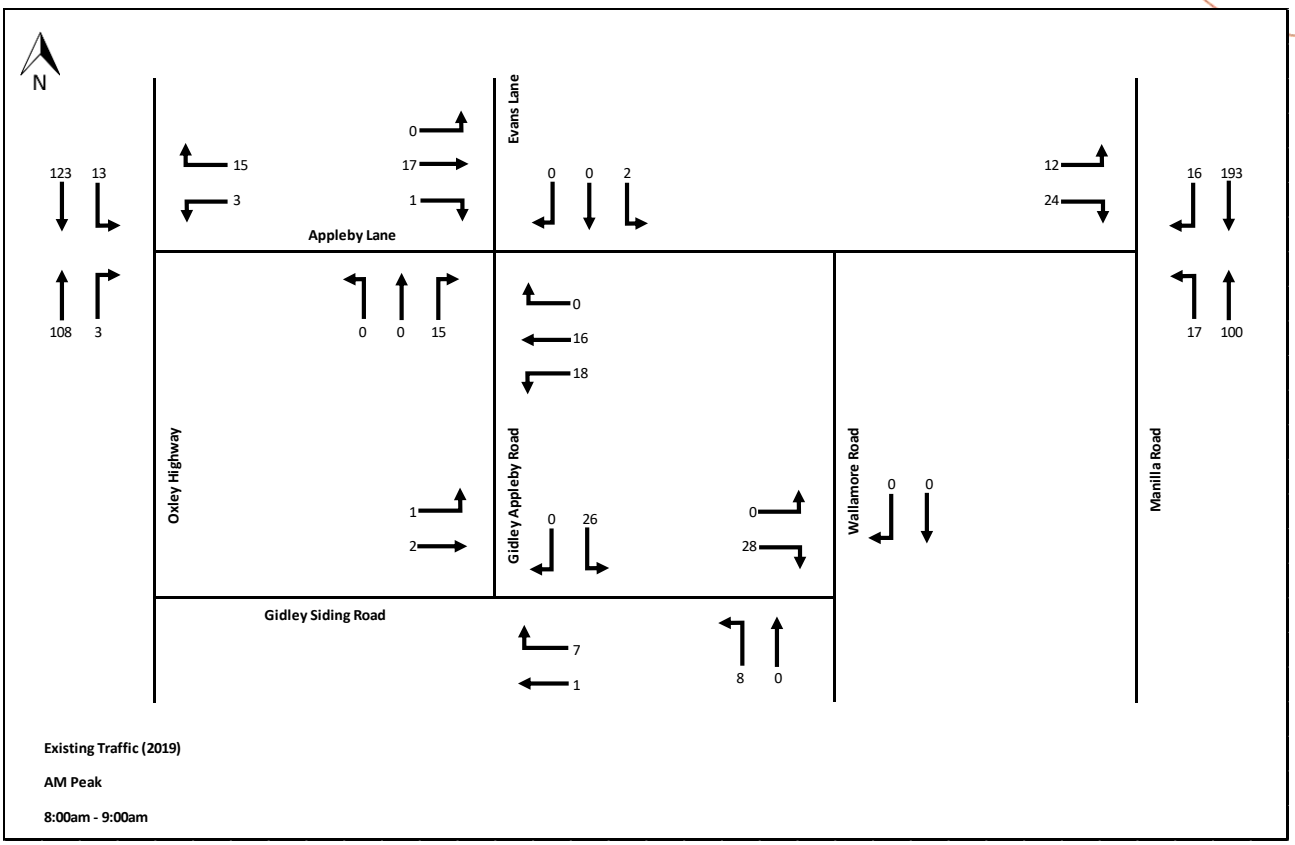


Figure 15: Existing (2019) AM peak hour traffic volumes (data source: Matrix, 2019 and pitt&sherry, 2019)

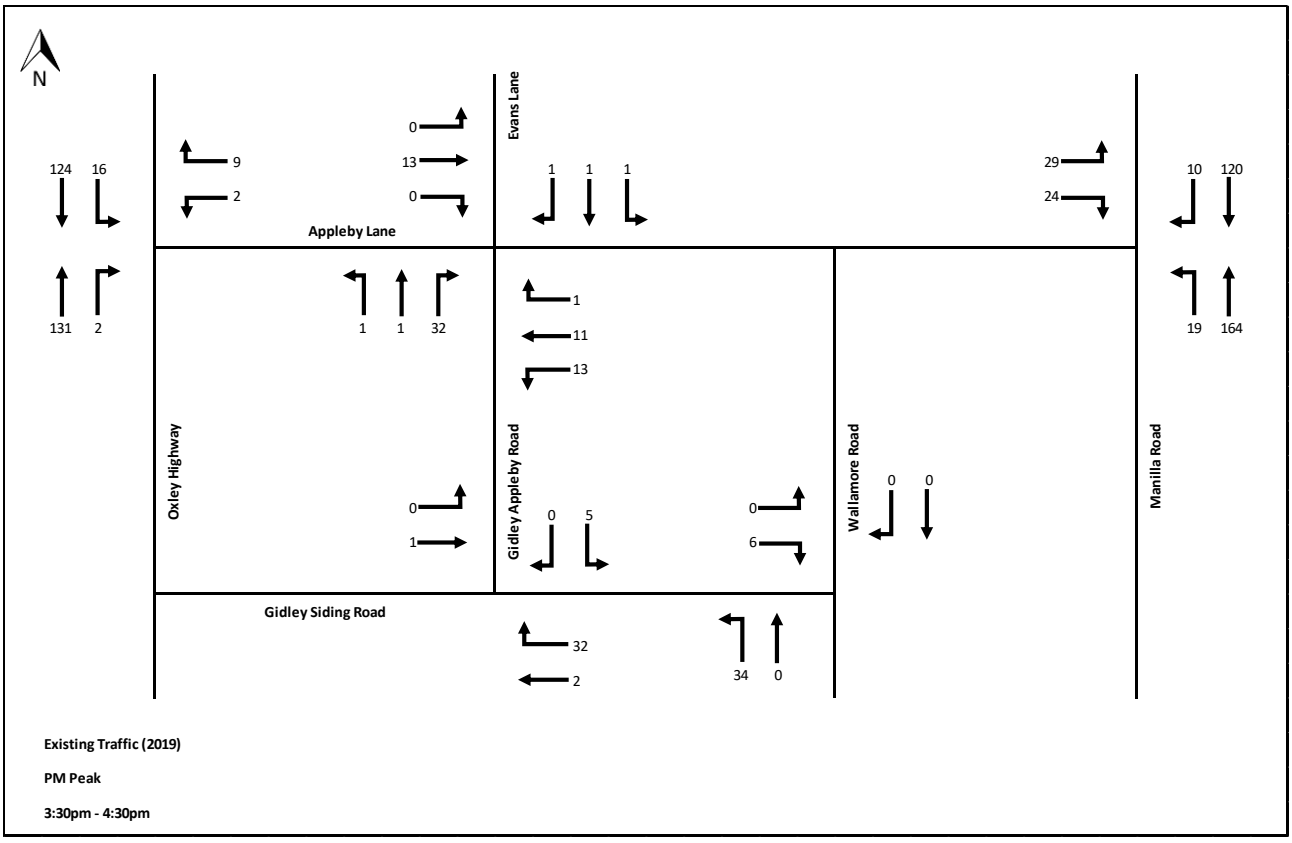


Figure 16: Existing (2019) PM peak hour traffic volumes (data source: Matrix 2019 and pitt&sherry, 2019)

2.6 Existing Performance

2.6.1 Traffic Modelling Software

The operation of the counted intersections has been modelled using SIDRA Intersection traffic modelling software. SIDRA Intersection rates the performance of the intersections based on the vehicle delay and the corresponding Level of Service (LOS). It is generally accepted that LOS D or better is an acceptable level of operation. Table 3 shows the criteria that SIDRA Intersection adopts in assessing the LOS.

Table 3: SIDRA intersection level of service (data source: SIDRA, 2018)

LOS	Delay per Vehicle (secs)		
	Signals	**Roundabout**	**Sign Control**
A	10 or less	10 or less	10 or less
B	10 to 20	10 to 20	10 to 15
C	20 to 35	20 to 35	15 to 25
D	35 to 55	35 to 50	25 to 35
E	55 to 80	50 to 70	35 to 50
F	Greater than 80	Greater than 70	Greater than 50

2.6.2 Traffic Modelling Results

Table 4 presents a summary of the SIDRA results for the existing intersection operation in the AM peak hour while Table 5 presents a summary of the SIDRA results for the existing intersection operation in the PM peak hour. Full results are presented in Appendix B.

Table 4: Existing (2019) AM peak hour operation SIDRA results (results source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.07	0	0	A
	East: Appleby Lane	0.02	9	0	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.07	1	0	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.02	9	0	A
	East: Appleby Lane	0.02	4	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.01	1	0	A
	All Vehicles	0.02	5	0	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.07	1	0	A
	North: Manilla Road	0.11	1	0	A
	West: Appleby lane	0.03	9	1	A
	All Vehicles	0.11	2	1	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.01	1	0	A
	North: Gidley Appleby Road	0.02	8	1	A
	West: Gidley Siding Road	0.00	3	0	A
	All Vehicles	0.02	6	1	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.01	7	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.01	8	1	A
	All Vehicles	0.01	8	1	A

Table 5: Existing (2019) PM peak hour SIDRA results (results source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.08	0	0	A
	East: Appleby Lane	0.01	9	0	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.08	1	0	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.03	9	1	A
	East: Appleby Lane	0.02	5	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.01	1	0	A
	All Vehicles	0.03	6	1	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.11	1	0	A
	North: Manilla Road	0.07	1	0	A
	West: Appleby lane	0.04	9	1	A
	All Vehicles	0.11	2	1	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.00	7	0	A
	North: Gidley Appleby Road	0.02	8	1	A
	West: Gidley Siding Road	0.00	3	0	A
	All Vehicles	0.02	8	1	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.02	8	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.00	8	0	A
	All Vehicles	0.02	8	0	A

Based on the results shown in Table 4 and Table 5, all modelled intersections currently operate well with minimal queues and delays on all approaches.

2.7 Public Transport and Pedestrian and Cycling Facilities

There are no public transport or pedestrian and cycling facilities along Gidley Siding Road, Gidley Appleby Road and Appleby Lane.

While there are no pedestrian and cycling facilities along Oxley Highway and Manilla Road, regional bus services do operate on these routes.

During the site visit, no pedestrians or cyclists were observed in the vicinity of the site.

3. Development Proposal

3.1 Overview

The proposed development includes a recycling facility for organic materials including Category 3 organics such as meat, fish, fatty foods, fatty and oily sludge and organics of animal and vegetable origin. The recycling facility will divert organic materials from being landfilled and process these materials using a Tunnel Composting System. End products of the recycling process include high grade mulch, compost and soil conditioners.

The materials to be recycled will be collected within the greater Tamworth region. This includes waste from households collected as regular kerbside waste and commercial waste from specific users such as abattoirs.

The proposed development upon opening will provide the Tamworth region an ORF, suitable to process up to 35,000tpa of a range of organic materials. It is estimated that the proposed development will receive 12,000t of organic materials within the first 6 months of operation. As the regional population increases and associated industries expand, it is expected the demand for the recycling facility will increase. Subject to further development approval, Council may seek to expand the facility's processing capacity to 50,000tpa in the future.

3.2 Staff and Operation

The proposed development will have a maximum of 6 staff on site between 7:45am and 5:00pm Monday to Sunday. There will be one shift per day.

The proposed ORF will be used by waste disposal contractors and is not open to the general public. The operating hours for the site are 8:00am to 4:45pm Monday to Sunday.

3.3 Vehicle Access and Circulation

Vehicle access and egress will be via a new site access to Gidley Appleby Road. The new access will be located near the southern end of the site. As the facility is located a fair distance back from the road edge, an internal road will connect the access to the facility.

Vehicles collecting processed organic waste will travel to the maturation pads located to the north of the main processing area. Access to the maturation pads will be using the internal circulation road which operates in a clockwise direction around the maturation pads. It is noted that vehicles collecting processed organic waste will drive directly onto and off the maturation pads as the maturation pads are hardstand areas.

Vehicles delivering organic waste will travel over a weigh bridge located prior to the entry to the main processing area.

Following this, vehicles will reverse into the receivals and processing shed along the southern boundary of the shed. Vehicles will drive directly out of the receivals and processing shed and exit in a forward direction.

Prior to exiting the site, all vehicles will pass through a wheel wash located at the south boundary of the recycling facility.

Key locations within the site are shown in Figure 17 while layout plans for the site are attached in Appendix A.

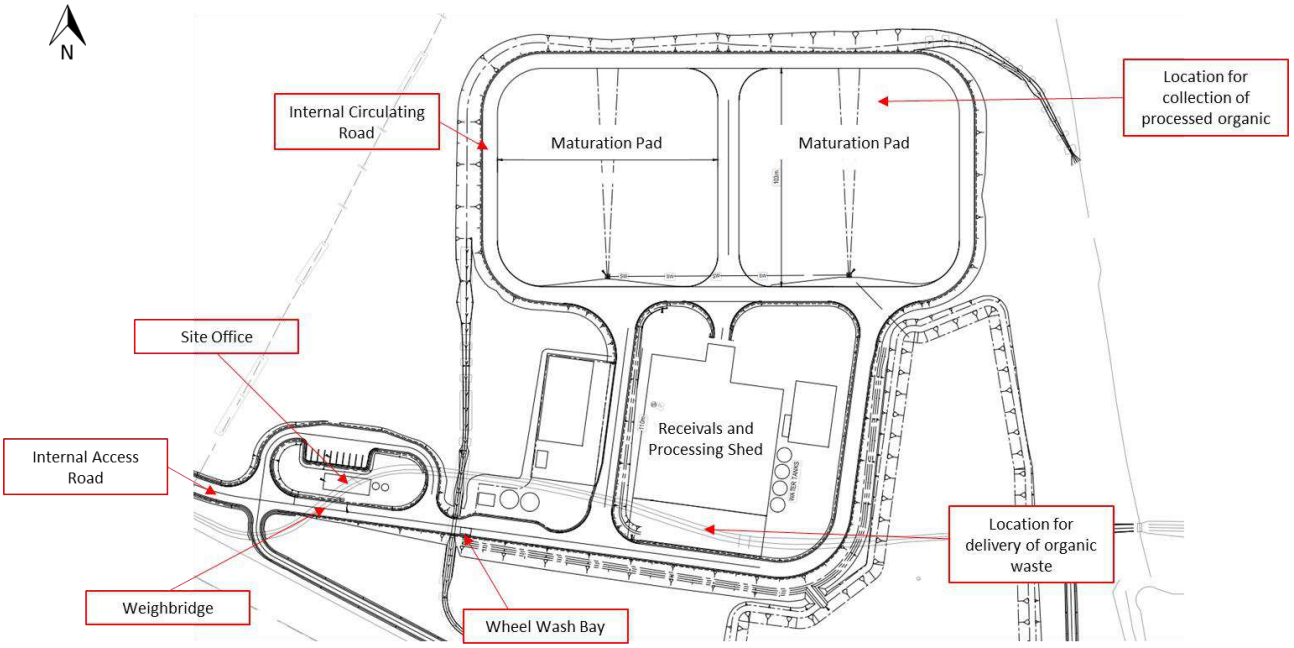


Figure 17: Key site locations

3.4 Vehicle Types

Several vehicle types will be used for the delivery and dispatch of organic waste. Tamworth Regional Council have indicated that a combination of the vehicle types shown in Table 6 would be used.

Table 6: Vehicle types using the facility (data source: Tamworth Regional Council, 2019)

Vehicle Type	Vehicle Length	Receivals/ Dispatch
Kerbside Collection Vehicle	6.5m and 10m	Receivals Only
Dual Axle Tipper	9m	Receivals and Dispatch
Semi-Trailer Tipper	15m	Receivals and Dispatch
Truck and Trailer Combination	18m	Dispatch Only
Quad Dog and Trailer	20m	Dispatch Only
B- Double Truck	26m	Dispatch Only

4. Transport Assessment

4.1 Site layout and Access

A swept path assessment has been undertaken for the proposed site access and layout to ensure all vehicle types used for the delivery and dispatch of organic waste are able to navigate the site. The swept path assessment, included in Appendix C, shows the following vehicle movements:

- Vehicles up to the size of B-double trucks can enter and exit the site in a forward direction.
- The entry along Gidley Appleby Road is not wide enough for two B-double trucks to pass each other while entering/ exiting concurrently (drawing SY19093-C11)
- Vehicles up to the size of B-double trucks can access the maturation pads (drawing SY19093-C13); and
- Vehicles up to the size of a 15m semi-trailer tipper can access the receivals and processing shed (drawing SY19093-C14).

It is noted that while the entry along Gidley Appleby Road is currently not wide enough for two B-double trucks to pass each other while entering/ exiting concurrently, minor widening of the internal access at the access point will allow two B-double trucks to pass each other. It is understood that the access will be widened during the Detailed Design Stage to allow two B-double trucks to pass each other while entering/ exiting concurrently.

4.2 Car Parking

4.2.1 Car Parking Provision

The *Tamworth Regional Development Control Plan (2010),* Appendix A – Parking Requirement Schedule specifies that an "industry" land use must provide parking at a rate of 1 space per 75m^2 GFA or 1 space per 2 employees, whichever is greater.

For a floor area of approximately 34,900m^2, the development is required to provide 466 parking spaces. For 6 staff, the development is required to provide 3 car parking spaces. As the parking requirement calculated based on the GFA is greater, the development is required to provide 466 parking spaces.

This parking requirement of 466 parking spaces based on the GFA is considered high for the development based on the expected operation of the development.

As discussed, there will be a maximum of 6 staff on site at any time with no general public access. Based on this, it is unlikely to be a need for more than 6 parking spaces during typical operations.

The proposed development provides 10 parking spaces adjacent to the site office, which is considered higher than the maximum requirement. It is noted that there is space opposite to the proposed car parking spaces to add additional spaces in the future if required.

4.2.2 Car Parking Layout

The car parking spaces on site are to be provided in accordance with the *Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS 2890.6:2009)* Class 1 requirements (staff parking).

The minimum Australian Standard requirements for the proposed dimensions of the car parks are shown in Table 7.

Table 7: Car parking layout requirements

Feature	Minimum Requirement	Proposed	Complies
Parking Space Width	2.4m	2.7m	Yes
Parking Space Length	5.4m	6.0m	Yes
Parking Space Aisle Width	5.8m	10.5m	Yes

Based on the above, the proposed car parking spaces meets the Australian Standard requirements.

4.3 Truck Parking

The Parking Requirement Schedule states that on-site truck parking spaces should be provided for each truck present at any one time excluding those trucks in loading docks. Should trucks be able to directly access the receivals and dispatch areas, no additional parking would be required.

If there is a possibility that all receivals and dispatch areas are full, parking spaces or waiting bays should be provided.

4.4 Traffic Impact Assessment

4.4.1 Traffic Generation

Due to the unique nature of this development, there is no traffic generation rate specified in the RMS Guide to Traffic Generating Developments (2002). As such, the traffic generation has been based on the expected operation of the development. Tamworth Regional Council has provided the following information which specifies vehicle movements at full operation, 10 years post development:

- The facility is expected to generate up to 20 trucks in a peak hour (40 truck movements); and
- The facility will employ 6 staff on the site; the staff will remain on site for a full day and will most likely access the site by car.

4.4.2 Traffic Distribution

The distribution of the traffic generated by the development is based on several factors including:

- Location of major traffic distribution roads around the site
- Location of traffic generating developments
- Existing traffic patterns
- Expected operation of the site, i.e.:
    - Majority of materials are received from the south in small trucks which generate higher traffic movements
    - Majority of materials are dispatched to the north in large trucks which generate low traffic movements when compared to receivals; and
    - Outbound traffic is restricted to right turns onto Gidley Appleby Road utilising Appleby Lane to access the Oxley Highway or Manilla Road.

Based on the above, the following distribution of traffic is assumed:

- 10% to/ from north
- 90% to/ from south

- 30% inbound using Oxley Highway
- 10% inbound using Manilla Road
- 60% inbound using Wallamore Road
- 40% outbound using Oxley Highway; and
- 60% outbound using Manilla Road.

Figure 18 shows the additional traffic volumes expected from the development.

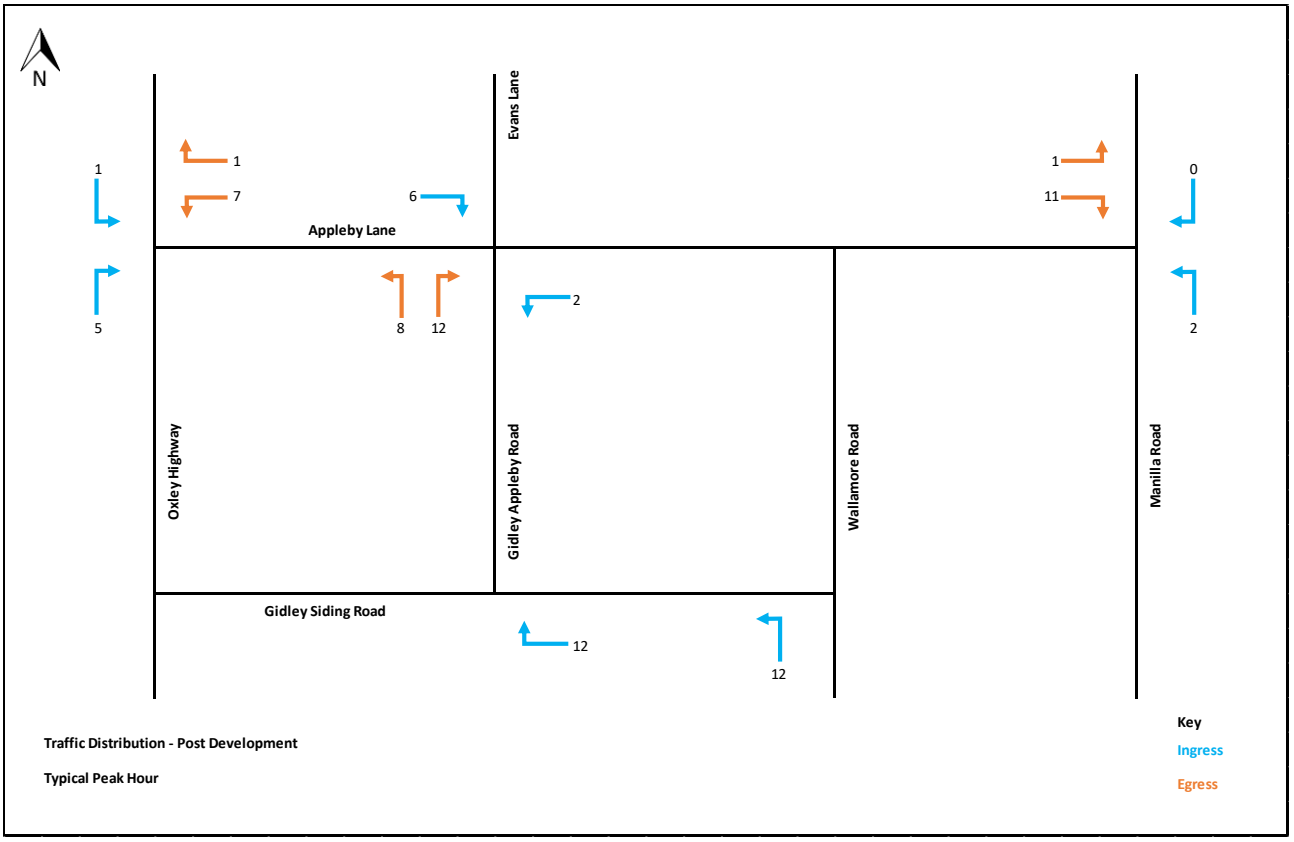


Figure 18: Full development (2029) additional traffic movements (data source: pitt&sherry, 2019)

Further information regarding the routes to be taken to the site by trucks is discussed in Section 8.

4.4.3 Traffic Impact

The traffic impact of the development has been assessed based on the following assumptions:

- The RMS traffic volume viewer shows declining traffic volumes on the Oxley Highway closest to the site. Therefore, no growth has been applied to the current traffic volumes along Oxley Highway
- A growth rate of 3% per year has been applied to the current traffic volumes along Manilla Road and Wallamore Road
- No other significant developments are understood to be provided in the immediate vicinity of the site within the foreseeable future; and
- Staff would enter and exit the site outside the peak operational times and therefore would not contribute to the peak hour traffic generation.

Based on the above, the traffic volumes for the AM and PM peak hours at the study intersections after full development (2029) are shown in Figure 19 and Figure 20. Full development (2029) is as discussed in Section 3.1.

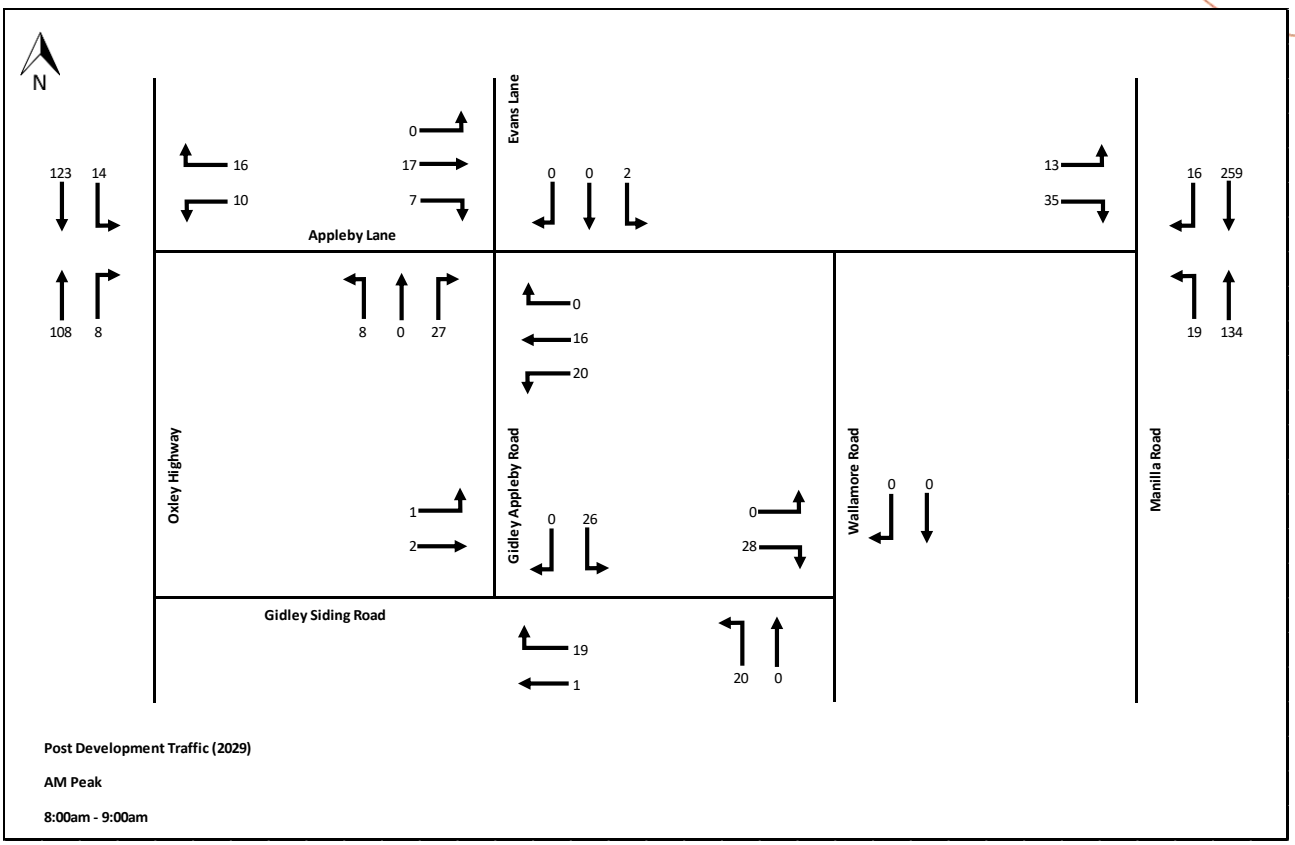


Figure 19: Full development (2029) am peak hour traffic volumes (data source: pitt&sherry, 2019)

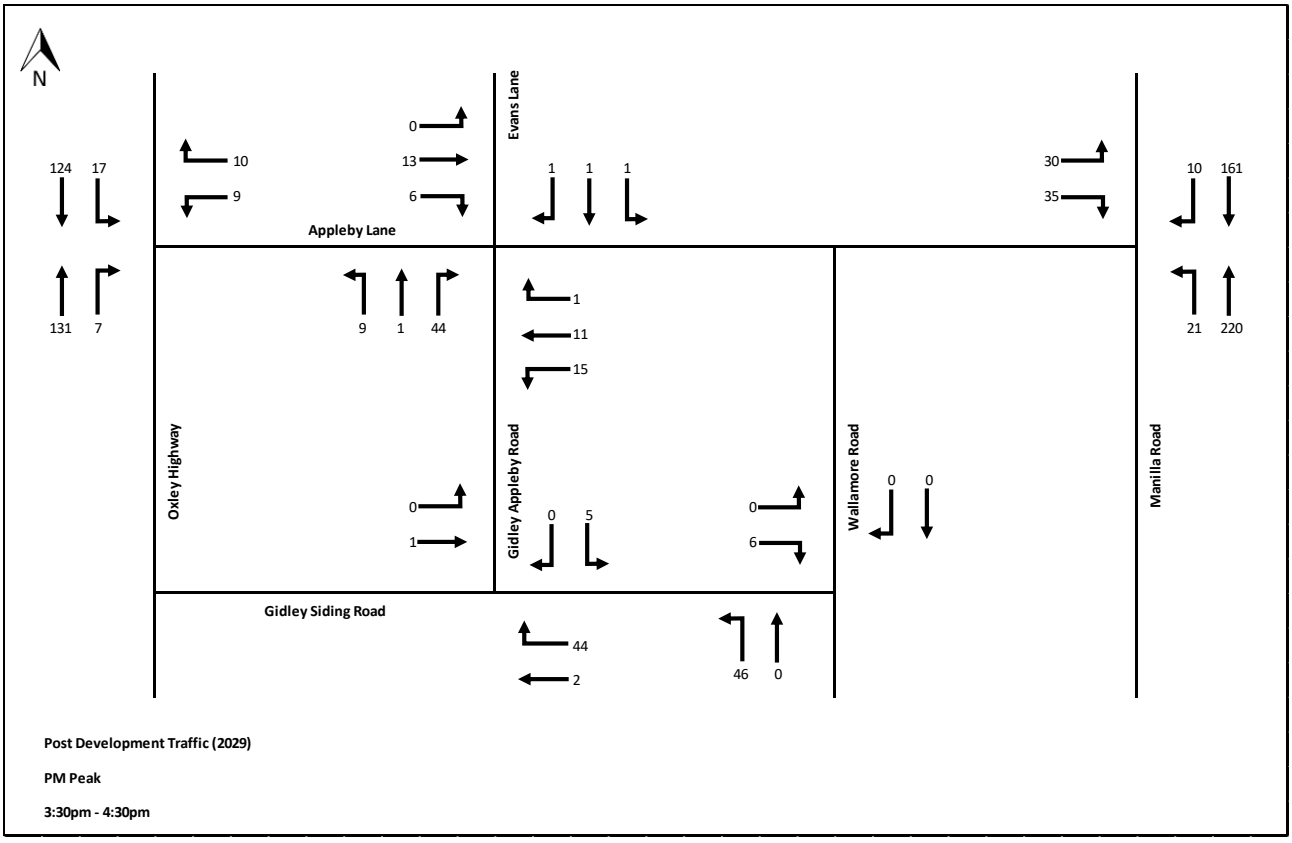


Figure 20: Full development (2029) pm peak hour traffic volumes (data source: pitt&sherry, 2019)

The operation of the counted intersections in the post development (2029) scenario has been modelled using SIDRA Intersection traffic modelling software. Table 8 and Table 9 presents a summary of the SIDRA results for the existing intersection operation. Full results are presented in Appendix D.

Table 8: Full development (2029) AM peak hour SIDRA results (results source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.07	1	1	A
	East: Appleby Lane	0.02	9	1	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.07	2	1	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.03	9	1	A
	East: Appleby Lane	0.02	5	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.01	3	0	A
	All Vehicles	0.03	6	1	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.07	1	0	A
	North: Manilla Road	0.11	1	0	A
	West: Appleby lane	0.04	9	1	A
	All Vehicles	0.11	2	1	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.01	8	0	A
	North: Gidley Appleby Road	0.02	8	1	A
	West: Gidley Siding Road	0.00	3	0	A
	All Vehicles	0.02	8	1	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.01	8	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.01	8	1	A
	All Vehicles	0.01	8	1	A

Table 9: Full Development (2029) PM Peak Hour SIDRA Results (Results Source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.09	1	1	A
	East: Appleby Lane	0.02	9	0	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.09	1	1	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.05	9	1	A
	East: Appleby Lane	0.02	5	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.01	3	0	A
	All Vehicles	0.05	6	1	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.11	1	0	A
	North: Manilla Road	0.07	1	0	A
	West: Appleby lane	0.06	9	2	A
	All Vehicles	0.11	2	2	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.02	8	1	A
	North: Gidley Appleby Road	0.00	8	0	A
	West: Gidley Siding Road	0.00	4	0	A
	All Vehicles	0.02	8	1	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.03	8	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.00	8	0	A
	All Vehicles	0.03	8	0	A

Based on the results shown in Table 8 and

Table 9, after full development, all modelled intersections are expected to continue to operate well with minimal queues and delays experienced on all approaches.

4.5 Route Suitability Assessment

As discussed, the proposed development will use a combination of vehicle types for the delivery and dispatch of organic waste, with the largest vehicle proposed being a 26m B-double truck. In order to ensure the proposed route for the delivery and dispatch vehicles is suitable, an assessment of the route has been undertaken against the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map, Austroads *Guide to Road Design Part 3: Geometric Design (2016)* requirements, *Austroads Guide to Road Design – Part 4: Intersections and Crossings (2017)* requirements and *National Transport Commission Guidelines (2007).*

4.5.1 NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map

In order to ensure a safe, efficient and sustainable road network, RMS approve routes around NSW for various types of vehicles.

Currently, the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map (2016) shows that all roads and intersections discussed in Section 2.3 are approved for B-double trucks up to 26m. It is noted that Wallamore Road is only approved for B-double trucks between Tamworth and the Wallamore Road/ Gidley Siding Road intersection and Gidley Siding Road is only approved for B-double trucks between Gidley Appleby Road and Wallamore Road.

Figure 21 shows the routes near the site approved for B-double trucks in the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map (2016). These routes are approved in accordance with the requirements contained in the Heavy Vehicle National Law (NHVL), the National Class 2 Heavy Vehicles B-double Authorisation (Notice) and the adjoining NSW Schedule and the New South Wales Higher Mass Limits Declaration 2015.

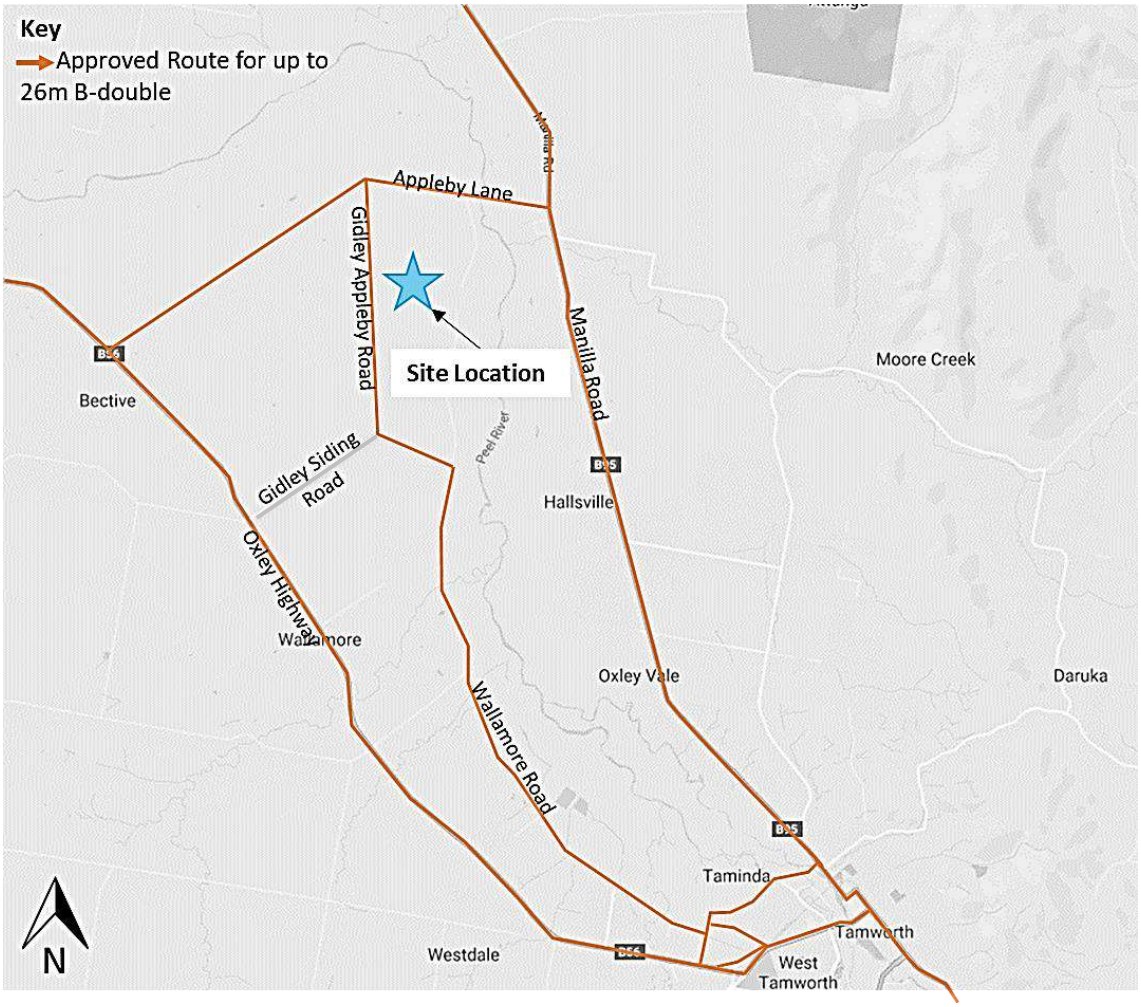


Figure 21: Approved routes for vehicles up to 26m B-Double trucks (base map source: Google Maps, 2019, Route Source: RMS, 2016)

4.5.2 Austroads Requirements

Lane Width

The *Austroads Guide to Road Design Part 3: Geometric Design (2016)* provides guidance to develop road alignments that cater for traffic at given speeds. For the proposed B-double routes, the Austroads Guide specifies a desirable lane width of 3.5m which allows two large vehicles to pass or overtake without either vehicle having to move sideways towards the outer edge of the lane.

As noted in Table 1, all roads proposed to be used as part of the development have a minimum lane width of 3.5m. As such, the route meets the *Austroads Guide to Road Design Part 3: Geometric Design (2016)* road alignment requirement.

Oxley Highway/ Appleby Lane Intersection

As discussed, the Oxley Highway/ Appleby Lane intersection currently operates as a give-way T-intersection. There is a Basic Right Turn (BAR) treatment and a Basic Left Turn (BAL) treatment on the Oxley Highway at the intersection.

The *Austroads Guide to Road Design – Part 4: Intersections and Crossings (2017)* specifies warrants for providing left and right turn treatments at unsignalised intersections. Figure 22 is an excerpt from the Austroads Guide that shows the volumes of traffic at an intersection subject to 100km/h speed limit or higher which would warrant turn treatments.

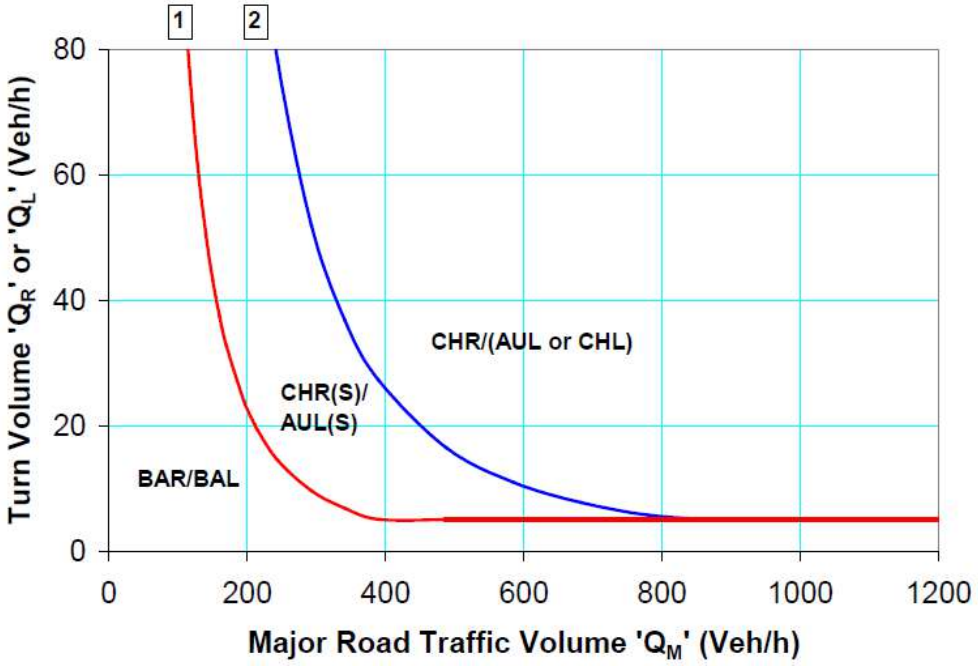


Figure 22: Austroads excerpt - warrants for turn treatments (graph source: Austroads, 2017)

The expected opposing movements to the right and left turners into Appleby Lane during the AM and PM peak hours after full development of the facility are shown in Table 10.

Table 10: Opposing movements to turning vehicles on Oxley Highway under full development (2029) scenario

Peak	QM (veh/hr)		QR (veh/ hr)	QL (veh/hr)
	Right	Left		
AM	245	123	8	14
PM	272	124	7	17

Based on an assessment of the opposing movements in Table 10, the warrants in the Austroads guide suggest that at a minimum a BAR treatment and a BAL treatment should be provided.

As these treatments are currently provided at the intersection, the intersection meets the *Austroads Guide to Road Design – Part 4: Intersections and Crossings (2017)* turn treatment requirements.

Manilla Road/ Appleby Lane Intersection

As discussed, the Manilla Road/ Appleby Lane intersection operates as a give-way T-intersection. A Channelised Right Turn (CHR) treatment and an Auxiliary Left Turn (AUL) treatment are currently provided on Manilla Road at the intersection.

The expected opposing movements to the right and left turners into Appleby Lane during the AM and PM peak hours after full development of the facility are shown in Table 11.

Table 11: Opposing movements to turning vehicles on manilla road under full development (2029) scenario

Peak	QM (veh/hr)		QR (veh/ hr)	QL (veh/hr)
	Right	Left		
AM	412	259	16	19
PM	402	161	10	21

Based on an assessment of the opposing movements in Table 11, the warrants in the Austroads guide suggest that at a minimum a CHR treatment and an AUL treatment should be provided.

As these treatments are currently provided at the intersection, the intersection meets the *Austroads Guide to Road Design – Part 4: Intersections and Crossings (2017)* turn treatment requirements.

4.5.3 National Transport Commission Guidelines

The National Transport Commission (NTC) Guidelines (2007) provides minimum lane and road width requirements to ensure the carriageway is sufficient for heavy vehicles without imposing a risk to other road users by impinging onto adjacent land where there are limited or no shoulders.

According to the NTC Guidelines, for a route to be used by B-double trucks with an AADT of more than 3,000 vehicles, a minimum lane width of 3.5m and a minimum shoulder width of 1.5m is required.

As all roads proposed to be used as part of the development have a minimum lane width of 3.5m and a minimum shoulder width of 1.5m, the requirements of the NTC Guidelines are met.

The proposed B-double routes, including intersections, meet the requirements of the Austroads Guide and National Transport Commission Guidelines and are part of the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map for B-double trucks. As such, it is expected that the route is suitable for vehicles up to a B-double truck in size.

It is noted that swept paths have not been undertaken along the route as the route is approved for B-double trucks in the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map (2016) and meets the requirements of the Austroads Guide and National Transport Commission Guidelines.

5. Road Upgrades

5.1 Intersections

The Wallamore Road/ Gidley Siding Road intersection and the Gidley Siding Road/ Gidley Appleby Road intersection are both T-intersections while the Gidley Appleby Road/ Appleby Lane/ Evans Lane intersection is a 4-leg intersection. Each intersection operates with give-way control. However, currently there is no signage or linemarking at these intersections resulting in confusion regarding priority at the intersections.

In order to resolve priority issues, give-way signage and linemarking should be installed at the minor roads interface at these intersections.

5.2 Internal Road

To enable vehicles to exit the site safely, the internal site circulation road should be sealed for approximately 30m back from the edge of Gidley Appleby Road in accordance to Austroads *Guide to Road Design Part 4: Intersections and Crossings – General (2017)*. This will allow suitable skid resistance for vehicles exiting onto Gidley Appleby Road and reduce the risk of loose gravel and mud from the site being dragged onto Gidley Appleby Road.

6. Construction Phase Traffic Assessment

A maximum of 40 delivery truck movements and 50 staff vehicles movements per day are expected during construction of the facility. The trucks will deliver materials to the site for internal road pavements and building materials.

Assuming all construction stage vehicles enter the site during the AM peak hour and exit the site during the PM peak hour using the traffic distribution identified in Section 4.4.1, the traffic volumes for the AM and PM peak hours at the study intersections during the construction phase is shown in Figure 23 and Figure 24.

It is noted that the traffic volumes shown are a worst-case scenario as all the construction stage vehicles would not be arriving during the AM peak and departing during the PM peak but would rather be distributed throughout the day.

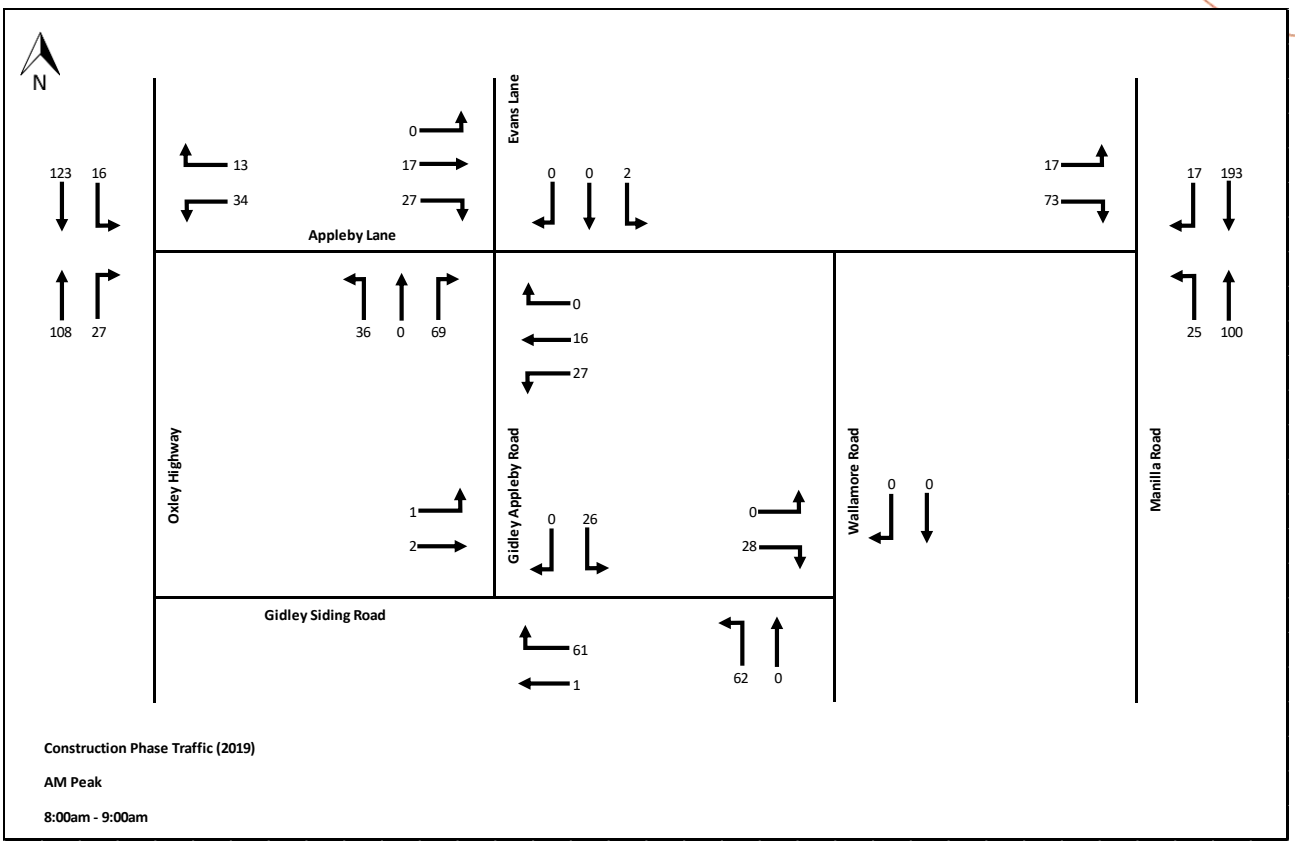


Figure 23: Construction phase (2019) AM peak hour traffic volumes (data source: pitt&sherry, 2019)

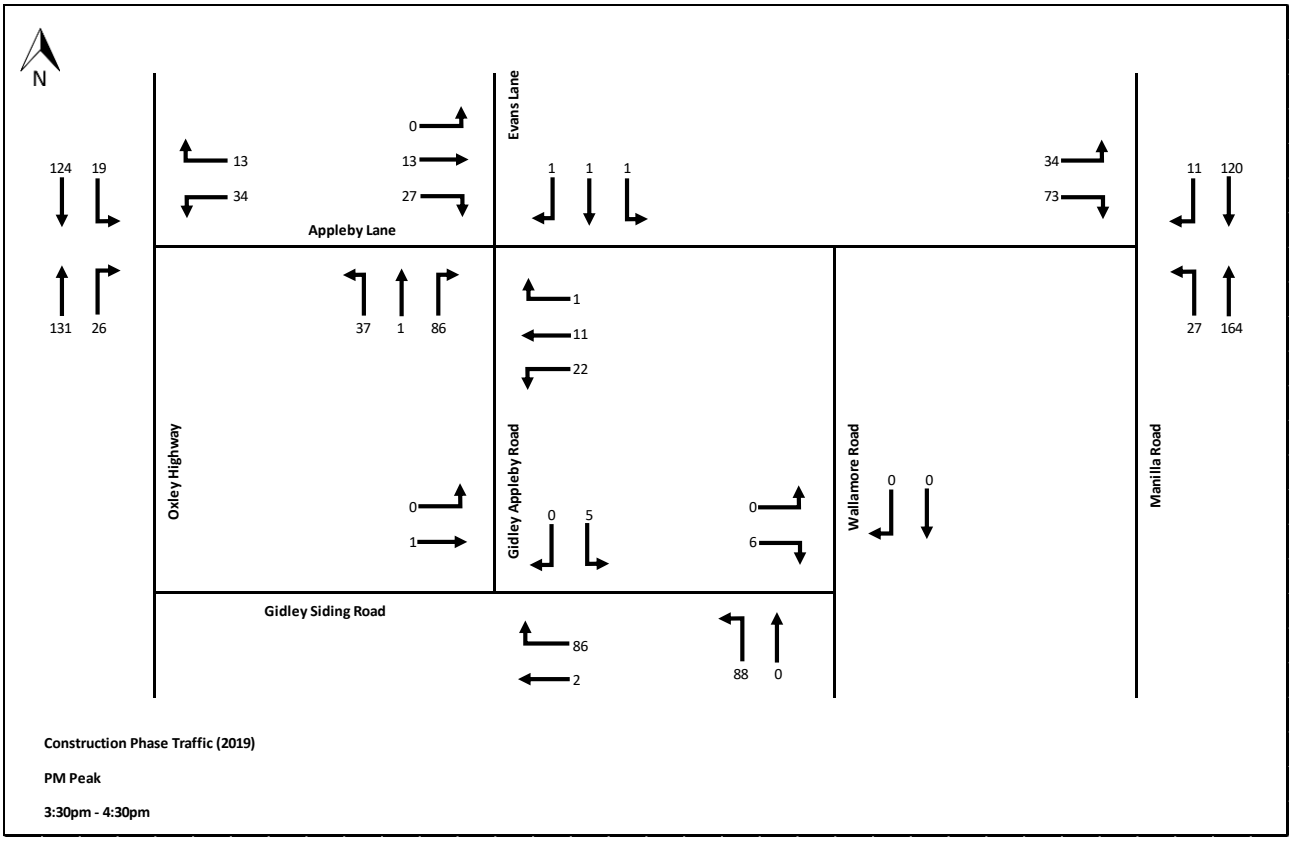


Figure 24: Construction phase (2019) PM peak hour traffic volumes (data source: pitt&sherry 2019)

Using the above, the operation of the counted intersections during construction 2019 has been modelled using SIDRA Intersection traffic modelling software. Table 12 and Table 13 presents a summary of the SIDRA results for the existing intersection operation. Full results are presented in Appendix E.

Table 12: Construction phase (2019) AM peak hour SIDRA results (results source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.09	2	2	A
	East: Appleby Lane	0.03	9	1	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.09	3	2	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.09	9	3	A
	East: Appleby Lane	0.03	5	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.02	5	1	A
	All Vehicles	0.09	7	3	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.08	2	0	A
	North: Manilla Road	0.11	1	0	A
	West: Appleby lane	0.09	9	2	A
	All Vehicles	0.11	3	2	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.03	8	1	A
	North: Gidley Appleby Road	0.02	8	1	A
	West: Gidley Siding Road	0.00	3	0	A
	All Vehicles	0.03	8	1	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.04	8	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.01	8	1	A
	All Vehicles	0.04	8	1	A

Table 13: Construction phase (2019) PM peak SIDRA results (results source: pitt&sherry, 2019)

Intersection	Approach	Degree of Saturation	Average Delay (secs)	95th Percentile Queue (m)	LOS
Oxley Highway/ Appleby Lane	South: Oxley Highway	0.10	2	2	A
	East: Appleby Lane	0.03	9	1	A
	North: Oxley Highway	0.07	1	0	A
	All Vehicles	0.10	2	2	A
Gidley Appleby Road/ Appleby Lane/ Evans Lane	South: Gidley Appleby Road	0.11	9	3	A
	East: Appleby Lane	0.02	6	0	A
	North: Evans Lane	0.00	8	0	A
	West: Appleby Lane	0.02	5	1	A
	All Vehicles	0.11	7	3	A
Manilla Road/ Appleby Lane	South: Manilla Road	0.12	1	0	A
	North: Manilla Road	0.07	1	0	A
	West: Appleby lane	0.10	9	3	A
	All Vehicles	0.12	3	3	A
Gidley Siding Road/ Gidley Appleby Road	East: Gidley Siding Road	0.04	8	2	A
	North: Gidley Appleby Road	0.00	8	0	A
	West: Gidley Siding Road	0.00	4	0	A
	All Vehicles	0.04	8	2	A
Wallamore Road/ Gidley Siding Road	South: Wallamore Road	0.06	8	0	A
	North: Wallamore Road	0.00	7	0	A
	West: Gidley Siding Road	0.00	8	0	A
	All Vehicles	0.06	8	0	A

Based on the assessment undertaken in Table 12 and Table 13, all modelled intersections are expected to operate well with minimal queues and delays experienced during the construction phase.

It is noted that the road upgrades discussed in Section 5.1 should be constructed prior to the Organic Recycling Facility construction to allow for heavy vehicles to access the site. Traffic management will be required for undertaking these works. Traffic management plans should be prepared in accordance with RMS Guidelines and Australian Standard AS1742.3.

7. Road Traffic Noise and Dust

The road traffic noise and dust assessment has been completed within the Environmental Impact Statement.

8. Code of Conduct for Heavy Vehicle Operators

Code of Conduct Measures that are to be considered for heavy vehicle operators are shown in Table 14.

Table 14: Code of Conduct

Code of Conduct Measures	Action
Primary haulage routes	As discussed, the material for the proposed facility will be collected within the greater Tamworth region including the town of Tamworth as regular kerbside waste. Vehicles are therefore required to access residential zones. Heavy vehicle traffic in residential areas should be limited to the relevant road ratings. For all movements outside residential areas, including vehicles accessing from industrial areas, vehicles would be expected to access the site from Manilla Road – Appleby Lane – Gidley Appleby Road, Oxley Highway – Appleby Lane – Gidley Appleby Road or Wallamore Road – Gidley Siding Road – Gidley Appleby Lane as discussed in this report. These roads are currently part of the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) map for heavy vehicles up to an 26m B-Double truck. A map of haulage routes close to the site is shown in Figure 25.
Safety initiatives for haulage through residential areas and school zones	Safety initiatives used during existing waste collection on residential streets and within school zones (including those on the Oxley Highway) should be implemented, including but not limited to flashing lights, left hand drive capability and audible reverse warning signals.
Vehicle operator induction and toolbox meetings	The operations will be conducted under the existing Tamworth Regional Council contracts for rubbish trucks. Therefore, the inductions for collection of waste in residential areas will be completed as part of this. Drivers should undertake an induction prior to visiting the proposed facility which would explain the routes to be taken to access the site and details about the site operation and vehicle circulation within the site. Records of training should be provided to the Organic Recycling Facility operator.
Community consultation	No additional waste collection will be undertaken as the facility will divert existing waste from landfill. Therefore, no community consultation would be required.
Complaints resolution	A contact phone number and/ or email address should be provided for residents to voice any complaints.

The Work Cover NSW publication *Collection of Domestic Waste Code of Practice (2005)* should also be referred to for all waste collection activities.

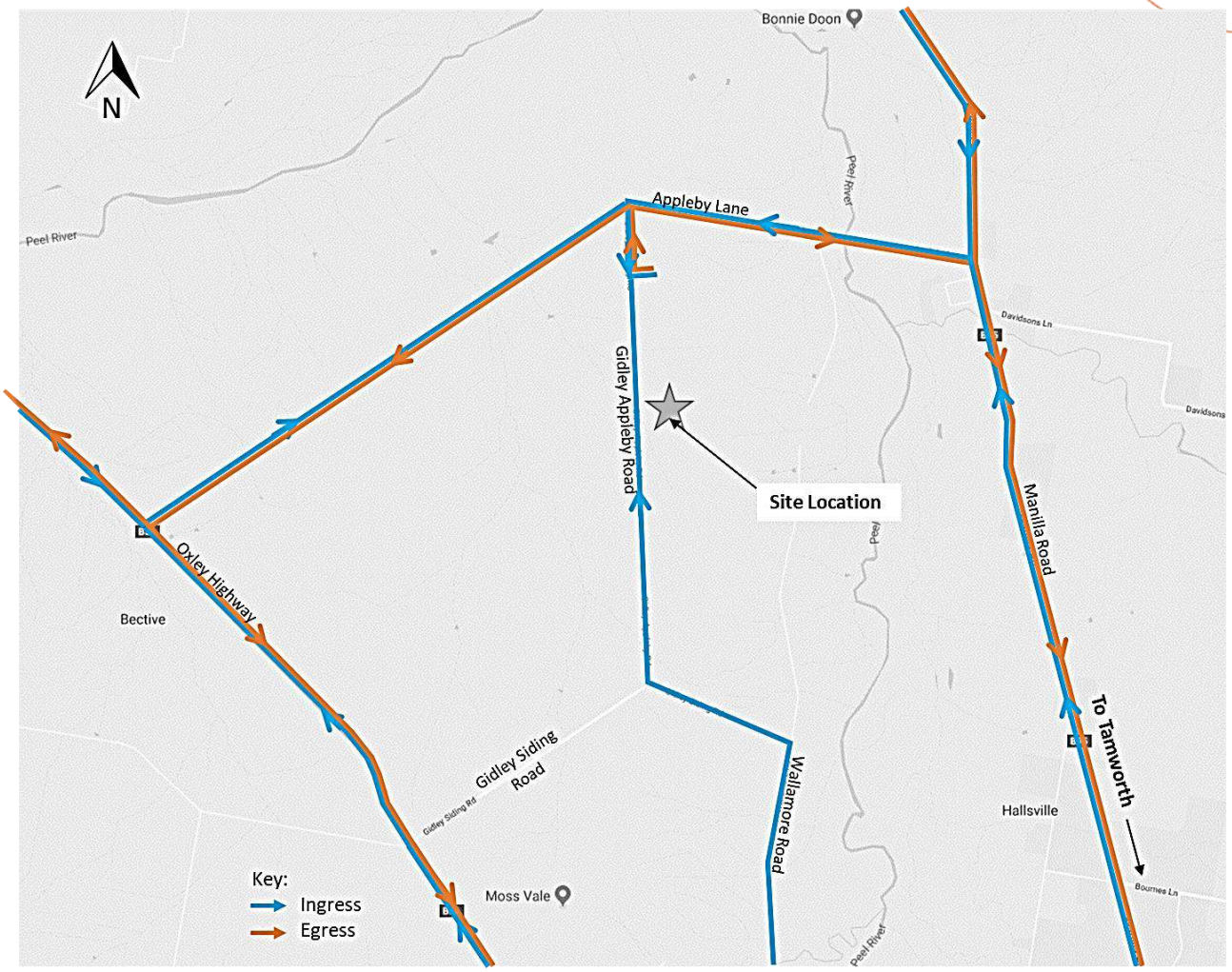


Figure 25: Haulage routes (base map source: Google Maps, 2019, route source: pitt&sherry, 2019)

9. Conclusion

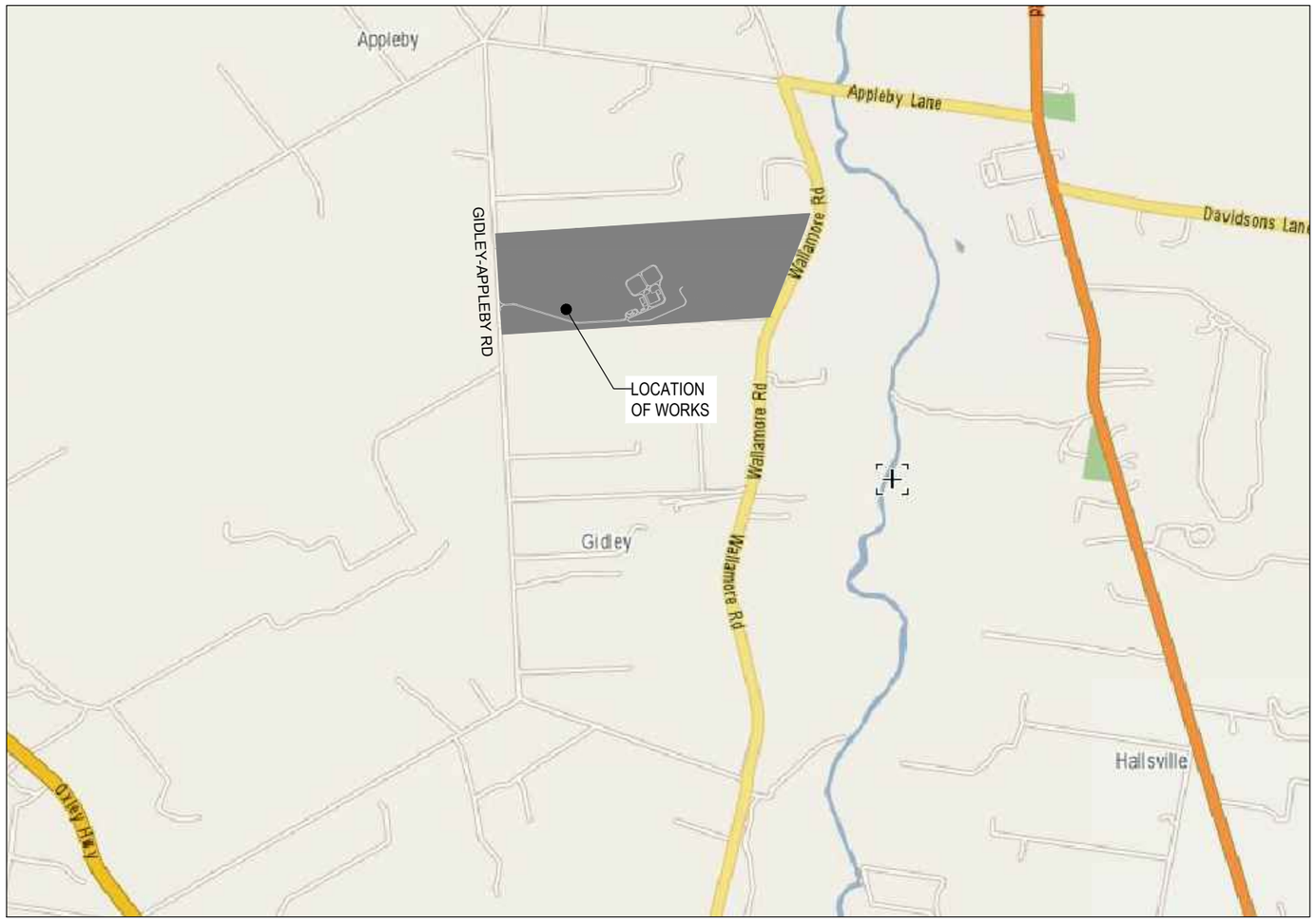
An assessment of the traffic impacts associated with the organic recycling facility development has been undertaken by a suitably qualified person in accordance with the *Austroads Guide to Traffic Management – Part 12 (2016)* and the *RMS Guide to Traffic Generating Developments (2002)*. The analysis and discussion presented in this report can be summarised as follows:

- The proposed transport route meets the requirements of the Austroads Guide and National Transport Commission Guidelines and is part of the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map for vehicles up to a 26m B-Double truck
- The additional traffic volumes generated by the development both during construction and operation are expected to have a minimal impact on the traffic function of the surrounding road network including the Oxley Highway, Manilla Road and Wallamore Road intersections
- Vehicles up to the size of B-double trucks can enter and exit the site in a forward direction
- The entry along Gidley Appleby Road is not wide enough for two B-double trucks to pass each other while entering/ exiting concurrently. It is understood that the access will be widened during the Detailed Design Stage to allow two B-double trucks to pass each other concurrently
- Vehicles up to the size of B-double trucks can access the receivals and dispatch area
- Vehicles up to the size of a 15m semi-trailer tipper can access the receivals and processing shed
- The car parking supply is adequate for staff parking
- Give-way signage and linemarking should be installed at the minor road interface of the at the Wallamore Road/ Gidley Siding Road, Gidley Siding Road, Gidley Appleby Road and Gidley Appleby Road/ Appleby Lane/ Evans Lane intersections
- The sight distance exceeds the Austroads requirement for a 100km/h road at the following intersections
    - Oxley Highway/ Appleby Lane
    - Manilla Road/ Appleby Lane
    - Gidley Appleby Road/ Appleby Lane/ Evans Lane
    - Gidley Siding Road/ Gidley Appleby Lane
    - Wallamore Road/ Gidley Siding Road; and
    - Site Access/ Gidley Appleby Road.

Appendix A

Site Layout Plans

TAMWORTH REGIONAL COUNCIL
ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF



NORTH

LOCALITY PLAN
N.T.S.

DRAWING INDEX	
DRAWING NO	DESCRIPTION
GENERAL	
SY19093-G01	DRAWING INDEX AND LOCALITY PLAN
CIVIL	
SY19093-C01	OVERALL SITE LAYOUT
SY19093-C02	SITE PLAN
SY19093-C03	DRAINAGE AND STORMWATER MANAGEMENT
SY19093-C05	PAVEMENT PLAN
SY19093-C06	PROPOSED PAVEMENT COMPOSITIONS
SY19093-C11	VEHICLE SWEPT PATH - SHEET 1
SY19093-C12	VEHICLE SWEPT PATH - SHEET 2
SY19093-C13	VEHICLE SWEPT PATH - SHEET 3
SY19093-C21	TRAFFIC SIGNAGE - SHEET 1
SY19093-C22	TRAFFIC SIGNAGE - SHEET 2

REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED
SIGNED
DATE

SCALE (PLOTTED FULL SIZE): AS SHOWN (A3)
SHEET SIZE: A3

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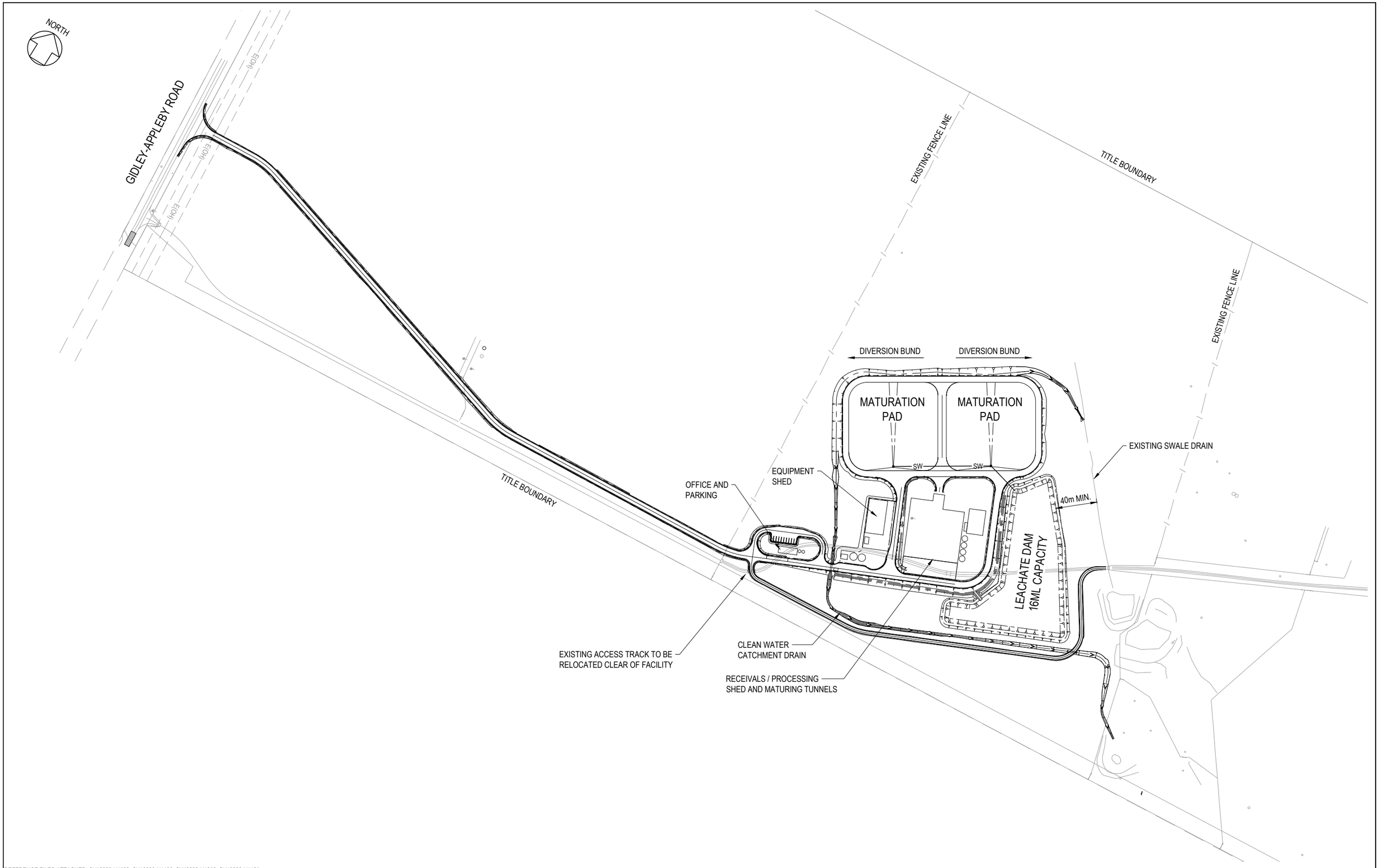
CLIENT: TAMWORTH REGIONAL COUNCIL
PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF
STATUS: **PRELIMINARY**

DRAWING TITLE: DRAWING INDEX AND LOCALITY PLAN
DATUMS: AHD / MGA
CLIENT No.: -
DRAWING No.: SY19093-G01
REVISION: A
Sep. 13, 19 - 11:30:22 Name: SY19093-G01.dwg Updated By: Rachel Ng

P&S FORM DRG-A3 REV - 8



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1850; SY19093-X1125

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

ORIGINAL COPY ON FILE "e" SIGNED BY

SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

40 0 40 80 120 160

SCALE IN METRES - 1:4000

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CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE OVERALL SITE LAYOUT

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C01

REVISION A

Sep. 12, 19 - 15:10:49 Name: SY19093-C01.dwg Updated By: Rachel Ng

NORTH

DIVERSION BUND

DIVERSION BUND

EXISTING SWALE DRAIN

4%

4%

2%

104m

MATURATION PAD

MATURATION PAD DRAINAGE PIT

6%

6%

SW

SW

SW

SW

4%

4%

2%

103m

MATURATION PAD

MATURATION PAD DRAINAGE PIT

6%

6%

SW

SW

EQUIPMENT STORAGE SHED

30m

99m

CLEAN WATER CATCHMENT DRAIN

70m

CARPARK

OFFICE

FUEL CUBE SELF BUNDED TANK

FIRE PUMP SHED

WATER TANKS

110m

RECEIVALS AND PROCESSING SHED

BIOFILTER

WATER TANKS

DRAINAGE OUTFALL TO LEACHATE DAM

LEACHATE DAM CAPACITY 16ML

WEIGHBRIDGE

WHEEL WASH BAY

RELOCATED ACCESS TRACK

TABLE DRAIN OUTFALL TO LEACHATE DAM

REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1125; SY19093-X1850

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

12.5 0 12.5 25 37.5 50

SCALE IN METRES - 1:1250

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STATUS **PRELIMINARY**

DRAWING TITLE SITE PLAN

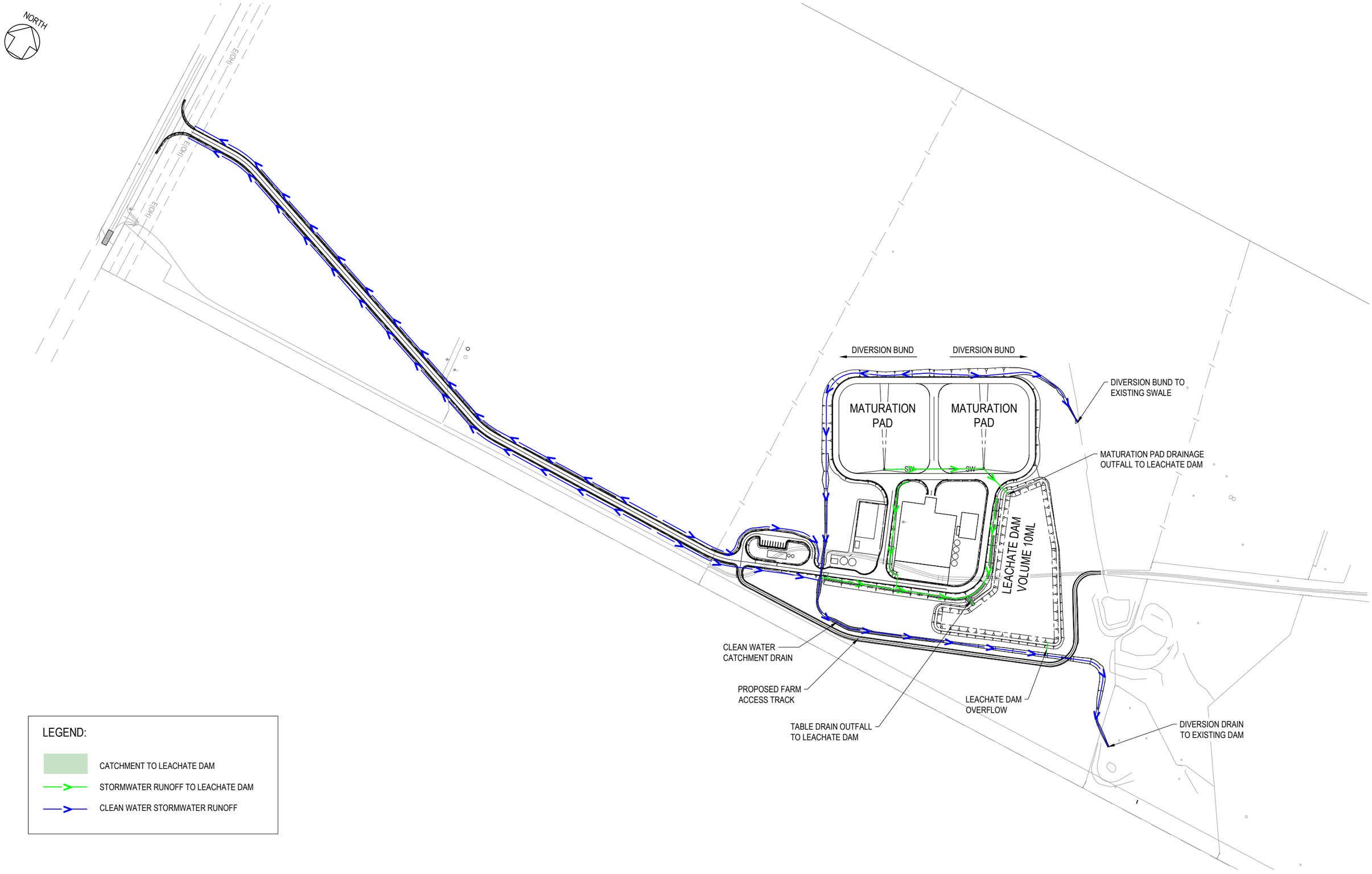
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C02

REVISION A

Sep. 13, 19 - 08:34:26 Name: SY19093-C02.dwg Updated By: Rachel Ng



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1125

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

40 0 40 80 120 160

SCALE IN METRES - 1:4000

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CLIENT: TAMWORTH REGIONAL COUNCIL

PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS: **PRELIMINARY**

DRAWING TITLE: DRAINAGE AND STORMWATER MANAGEMENT

DATUMS: AHD / MGA

CLIENT No. -

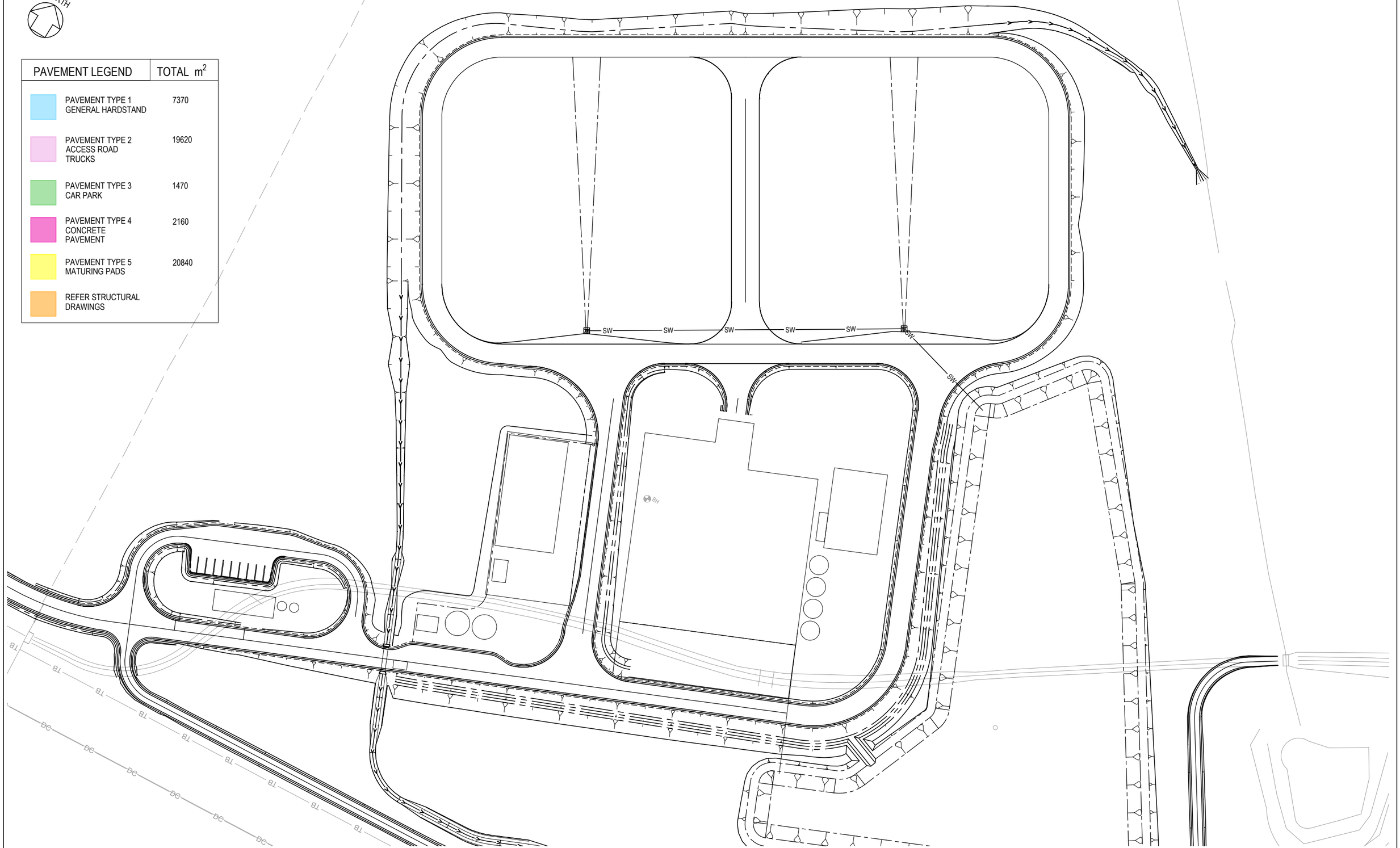
DRAWING No. SY19093-C03

REVISION A

Sep. 12, 19 - 15:12:05 Name: SY19093-C03.dwg Updated By: Rachel Ng

NORTH

PAVEMENT LEGEND	TOTAL m^2
PAVEMENT TYPE 1 GENERAL HARDSTAND	7370
PAVEMENT TYPE 2 ACCESS ROAD TRUCKS	19620
PAVEMENT TYPE 3 CAR PARK	1470
PAVEMENT TYPE 4 CONCRETE PAVEMENT	2160
PAVEMENT TYPE 5 MATURING PADS	20840
REFER STRUCTURAL DRAWINGS	



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1850; SY19093-X1130

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

12.5 0 12.5 25 37.5 50

SCALE IN METRES - 1:1250

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STATUS **PRELIMINARY**

DRAWING TITLE PAVEMENT PLAN

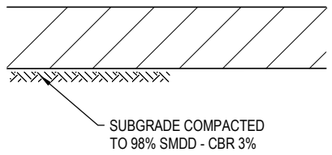
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C05

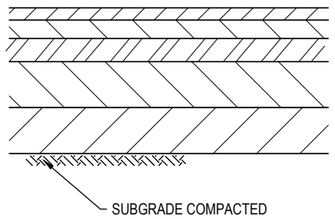
REVISION A

Sep. 12, 19 - 15:25:27 Name: SY19093-C05.dwg Updated By: Rachel Ng



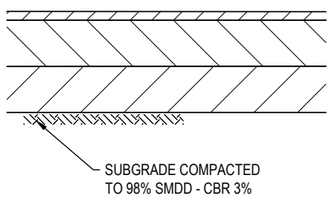
A	200mm	DGB20 (REFER RMS 3051) SCALE A COMPACTION
TOTAL	200mm	

PAVEMENT TYPE 1
GENERAL HARDSTAND



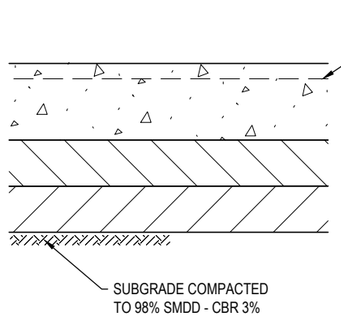
A	40mm	DG14 CLASS 320 BINDER (REFER RMS 3253)
B	60mm	DG20 CLASS 320 BINDER (REFER RMS 3253)
C	75mm	DG20 CLASS 320 BINDER (REFER RMS 3253)
D	150mm	MB20 (REFER RMS 3051) SCALE A COMPACTION
E	150mm	SMZ (REFER RMS 3071) SCALE A COMPACTION
TOTAL	475mm	

PAVEMENT TYPE 2
ACCESS ROAD TRUCKS



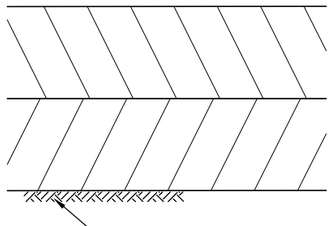
A	30mm	DG10 CLASS 320 BINDER
B	150mm	DGB20 (REFER RMS 3051) SCALE A COMPACTION
C	150mm	DGS20 (REFER RMS 3051) SCALE A COMPACTION
TOTAL	330mm	

PAVEMENT TYPE 3
CAR PARK



A	250mm	40MPa CONCRETE. MINIMUM SHRINKAGE STRAIN 450 MICROSTRAIN
B	150mm	LCS (REFER RMS R82)
C	150mm	SMZ (REFER RMS 3071) SCALE A COMPACTION
TOTAL	550mm	

PAVEMENT TYPE 4
CONCRETE PAVEMENT



A	300mm	CLAY. MAXIMUM PERMEABILITY 10 to minus 7 SCALE A COMPACTION
B	-	SCOUR SURFACE TO PREVENT LAMINATION
C	300mm	CLAY. MAXIMUM PERMEABILITY 10 to minus 7 SCALE A COMPACTION
TOTAL	600mm	

PAVEMENT TYPE 5
MATURING PADS

NOTES
1. GEOTECHNICAL ENGINEER IS INVESTIGATING WHETHER LAYERS A AND C CAN BE SITE WON (AS CURRENTLY EXISTS OR MODIFIED WITH ADDITIVES).
2. PAVEMENT CONFIGURATIONS ARE PRELIMINARY AND SUBJECT TO CHANGE. CLIENT TO PROVIDE TRAFFIC LOADING AND DESIGN CBR OF SUBGRADE.

REFERENCE FILES ATTACHED: SY19093-X1125; SY19093-X1850

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SCALE (PLOTTED FULL SIZE): AS SHOWN (A3)
SHEET SIZE: A3

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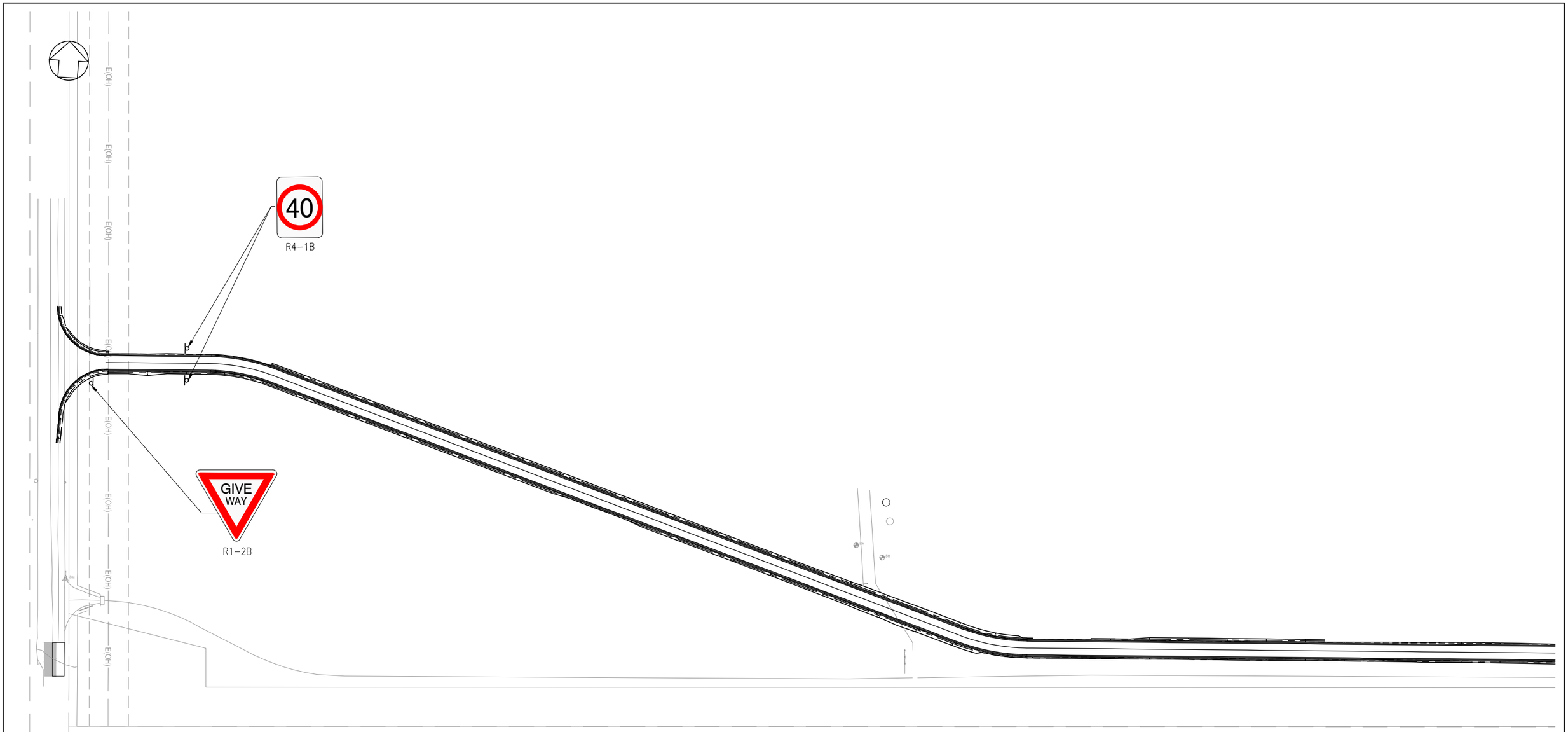
CLIENT: TAMWORTH REGIONAL COUNCIL
PROJECT: ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF
STATUS: **PRELIMINARY**

DRAWING TITLE: PROPOSED PAVEMENT COMPOSITIONS
DATUMS:
CLIENT No. -
DRAWING No. SY19093-C06
REVISION A
Sep. 13, 19 - 09:35:25 Name: SY19093-C06.dwg Updated By: Rachel Ng



REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1850; SY19093-X1101; SY19093-X1125; SY19093-X1500

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

20 0 20 40 60 80

SCALE IN METRES - 1:2000

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CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE TRAFFIC SIGNAGE SHEET 1

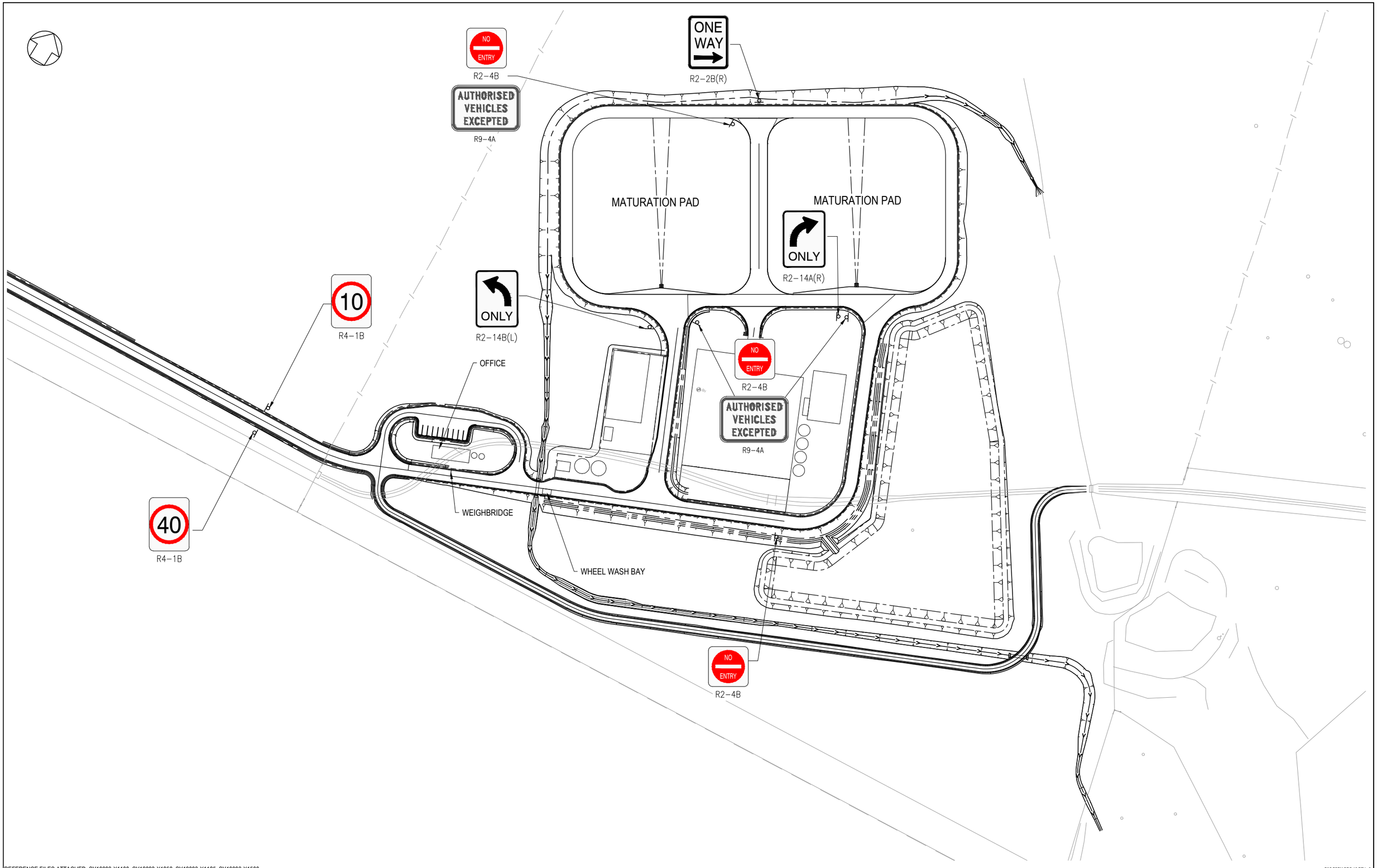
DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C21

REVISION A

Sep. 12, 19 - 15:04:00 Name: SY19093-C21.dwg Updated By: Rachel Ng



REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1850; SY19093-X1125; SY19093-X1500

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

20 0 20 40 60 80

SCALE IN METRES - 1:2000

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PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE TRAFFIC SIGNAGE SHEET 2

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C22

REVISION A

Sep. 12, 19 - 15:36:47 Name: SY19093-C22.dwg Updated By: Rachel Ng

Appendix B

Existing Operation SIDRA Results

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Existing 2019 AM Peak]

08:00-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	114	20.0	0.068	0.0	LOS A	0.0	0.2	0.02	0.02	0.02	99.2
3	R2	3	30.0	0.068	8.8	LOS A	0.0	0.2	0.02	0.02	0.02	73.4
Approach		117	20.3	0.068	0.3	NA	0.0	0.2	0.02	0.02	0.02	98.3
East: Appleby Lane												
4	L2	3	10.0	0.016	8.4	LOS A	0.1	0.4	0.27	0.63	0.27	69.7
6	R2	16	10.0	0.016	8.7	LOS A	0.1	0.4	0.27	0.63	0.27	69.4
Approach		19	10.0	0.016	8.7	LOS A	0.1	0.4	0.27	0.63	0.27	69.5
North: Oxley Highway												
7	L2	14	10.0	0.008	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	129	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		143	10.0	0.071	0.8	NA	0.0	0.0	0.00	0.06	0.00	96.2
All Vehicles		279	14.3	0.071	1.1	NA	0.1	0.4	0.03	0.08	0.03	94.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Existing 2019 AM Peak]

08:0-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	1	10.0	0.016	8.1	LOS A	0.0	0.4	0.09	0.65	0.09	71.0
2	T1	1	10.0	0.016	7.0	LOS A	0.0	0.4	0.09	0.65	0.09	71.1
3	R2	16	40.0	0.016	8.6	LOS A	0.0	0.4	0.09	0.65	0.09	61.0
Approach		18	36.5	0.016	8.5	LOS A	0.0	0.4	0.09	0.65	0.09	62.0
East: Appleby Lane												
4	L2	19	10.0	0.020	8.1	LOS A	0.0	0.1	0.01	0.37	0.01	76.3
5	T1	17	5.0	0.020	0.0	LOS A	0.0	0.1	0.01	0.37	0.01	89.7
6	R2	1	10.0	0.020	7.7	LOS A	0.0	0.1	0.01	0.37	0.01	75.7
Approach		37	7.7	0.020	4.4	NA	0.0	0.1	0.01	0.37	0.01	81.9
North: Evans Lane												
7	L2	2	10.0	0.003	8.1	LOS A	0.0	0.1	0.06	0.63	0.06	71.1
8	T1	1	10.0	0.003	7.0	LOS A	0.0	0.1	0.06	0.63	0.06	71.2
9	R2	1	10.0	0.003	7.8	LOS A	0.0	0.1	0.06	0.63	0.06	70.5
Approach		4	10.0	0.003	7.7	LOS A	0.0	0.1	0.06	0.63	0.06	71.0
West: Appleby Lane												
10	L2	1	10.0	0.011	8.1	LOS A	0.0	0.1	0.02	0.07	0.02	81.9
11	T1	18	10.0	0.011	0.0	LOS A	0.0	0.1	0.02	0.07	0.02	97.6
12	R2	1	10.0	0.011	7.8	LOS A	0.0	0.1	0.02	0.07	0.02	81.2
Approach		20	10.0	0.011	0.8	NA	0.0	0.1	0.02	0.07	0.02	95.6
All Vehicles		79	14.9	0.020	4.6	NA	0.0	0.4	0.03	0.37	0.03	78.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Existing 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	18	20.0	0.072	8.4	LOS A	0.0	0.0	0.00	0.10	0.00	77.1
2	T1	105	20.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	96.9
Approach		123	20.0	0.072	1.2	NA	0.0	0.0	0.00	0.10	0.00	93.4
North: Manilla Road												
8	T1	203	10.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
9	R2	17	10.0	0.008	8.0	LOS A	0.0	0.3	0.25	0.59	0.25	69.7
Approach		220	10.0	0.111	0.6	NA	0.0	0.3	0.02	0.05	0.02	96.7
West: Appleby lane												
10	L2	13	30.0	0.032	8.9	LOS A	0.1	0.9	0.25	0.65	0.25	63.8
12	R2	25	10.0	0.032	8.8	LOS A	0.1	0.9	0.25	0.65	0.25	69.4
Approach		38	16.7	0.032	8.9	LOS A	0.1	0.9	0.25	0.65	0.25	67.5
All Vehicles		381	13.9	0.111	1.6	NA	0.1	0.9	0.04	0.12	0.04	91.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Existing 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	1	10.0	0.004	0.0	LOS A	0.0	0.2	0.03	0.58	0.03	84.9
6	R2	7	20.0	0.004	8.0	LOS A	0.0	0.2	0.03	0.58	0.03	68.5
Approach		8	18.8	0.004	7.0	NA	0.0	0.2	0.03	0.58	0.03	70.2
North: Gidley Appleby Road												
7	L2	27	20.0	0.015	8.4	LOS A	0.1	0.6	0.02	0.65	0.02	67.5
9	R2	1	10.0	0.015	7.7	LOS A	0.1	0.6	0.02	0.65	0.02	70.3
Approach		28	19.6	0.015	8.3	LOS A	0.1	0.6	0.02	0.65	0.02	67.6
West: Gidley Siding Road												
10	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.00	0.23	0.00	78.8
11	T1	2	10.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	93.3
Approach		3	10.0	0.002	2.7	NA	0.0	0.0	0.00	0.23	0.00	87.9
All Vehicles		40	18.7	0.015	7.6	NA	0.1	0.6	0.02	0.60	0.02	69.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ Gldley Siding Road Existing 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	8	20.0	0.006	8.4	LOS A	0.0	0.0	0.00	0.59	0.00	68.8
2	T1	1	10.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.59	0.00	84.2
Approach		9	18.9	0.006	7.4	NA	0.0	0.0	0.00	0.59	0.00	70.2
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.06	0.63	0.06	71.7
9	R2	1	10.0	0.001	7.7	LOS A	0.0	0.0	0.06	0.63	0.06	71.1
Approach		2	10.0	0.001	7.3	LOS A	0.0	0.0	0.06	0.63	0.06	71.4
West: Gidley Siding Road												
10	L2	1	10.0	0.014	8.1	LOS A	0.1	0.6	0.01	0.67	0.01	71.3
12	R2	29	20.0	0.014	8.0	LOS A	0.1	0.6	0.01	0.67	0.01	67.3
Approach		31	19.7	0.014	8.0	NA	0.1	0.6	0.01	0.67	0.01	67.4
All Vehicles		42	19.0	0.014	7.8	NA	0.1	0.6	0.01	0.65	0.01	68.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Existing 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	138	20.0	0.082	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	99.6
3	R2	2	30.0	0.082	8.9	LOS A	0.0	0.1	0.01	0.01	0.01	73.6
Approach		140	20.2	0.082	0.1	NA	0.0	0.1	0.01	0.01	0.01	99.0
East: Appleby Lane												
4	L2	2	10.0	0.010	8.4	LOS A	0.0	0.2	0.27	0.62	0.27	69.6
6	R2	9	10.0	0.010	8.8	LOS A	0.0	0.2	0.27	0.62	0.27	69.4
Approach		12	10.0	0.010	8.7	LOS A	0.0	0.2	0.27	0.62	0.27	69.4
North: Oxley Highway												
7	L2	17	10.0	0.010	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	131	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		147	10.0	0.071	0.9	NA	0.0	0.0	0.00	0.08	0.00	95.5
All Vehicles		299	14.8	0.082	0.9	NA	0.0	0.2	0.02	0.07	0.02	95.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Existing 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	1	10.0	0.032	8.1	LOS A	0.1	0.8	0.08	0.65	0.08	71.0
2	T1	1	10.0	0.032	6.9	LOS A	0.1	0.8	0.08	0.65	0.08	71.1
3	R2	34	40.0	0.032	8.6	LOS A	0.1	0.8	0.08	0.65	0.08	61.0
Approach		36	38.2	0.032	8.5	LOS A	0.1	0.8	0.08	0.65	0.08	61.6
East: Appleby Lane												
4	L2	14	10.0	0.015	8.1	LOS A	0.0	0.1	0.01	0.38	0.01	76.1
5	T1	12	5.0	0.015	0.0	LOS A	0.0	0.1	0.01	0.38	0.01	89.4
6	R2	1	10.0	0.015	7.7	LOS A	0.0	0.1	0.01	0.38	0.01	75.5
Approach		26	7.8	0.015	4.5	NA	0.0	0.1	0.01	0.38	0.01	81.4
North: Evans Lane												
7	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.06	0.63	0.06	71.3
8	T1	1	10.0	0.002	6.9	LOS A	0.0	0.0	0.06	0.63	0.06	71.4
9	R2	1	10.0	0.002	7.7	LOS A	0.0	0.0	0.06	0.63	0.06	70.8
Approach		3	10.0	0.002	7.6	LOS A	0.0	0.0	0.06	0.63	0.06	71.1
West: Appleby Lane												
10	L2	1	10.0	0.009	8.1	LOS A	0.0	0.1	0.02	0.09	0.02	81.5
11	T1	14	10.0	0.009	0.0	LOS A	0.0	0.1	0.02	0.09	0.02	97.1
12	R2	1	10.0	0.009	7.7	LOS A	0.0	0.1	0.02	0.09	0.02	80.8
Approach		16	10.0	0.009	1.1	NA	0.0	0.1	0.02	0.09	0.02	94.6
All Vehicles		81	21.8	0.032	5.7	NA	0.1	0.8	0.04	0.45	0.04	72.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Existing 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	20	20.0	0.112	8.4	LOS A	0.0	0.0	0.00	0.07	0.00	77.6
2	T1	173	20.0	0.112	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	97.8
Approach		193	20.0	0.112	0.9	NA	0.0	0.0	0.00	0.07	0.00	95.2
North: Manilla Road												
8	T1	126	10.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	11	10.0	0.006	8.2	LOS A	0.0	0.2	0.32	0.58	0.32	69.3
Approach		137	10.0	0.069	0.6	NA	0.0	0.2	0.02	0.04	0.02	96.7
West: Appleby lane												
10	L2	31	30.0	0.044	9.2	LOS A	0.2	1.4	0.30	0.64	0.30	63.5
12	R2	25	10.0	0.044	8.8	LOS A	0.2	1.4	0.30	0.64	0.30	69.1
Approach		56	20.9	0.044	9.0	LOS A	0.2	1.4	0.30	0.64	0.30	65.9
All Vehicles		385	16.6	0.112	2.0	NA	0.2	1.4	0.05	0.14	0.05	89.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Existing 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	2	10.0	0.017	0.0	LOS A	0.1	0.7	0.02	0.63	0.02	83.9
6	R2	34	20.0	0.017	8.0	LOS A	0.1	0.7	0.02	0.63	0.02	67.9
Approach		36	19.4	0.017	7.5	NA	0.1	0.7	0.02	0.63	0.02	68.6
North: Gidley Appleby Road												
7	L2	5	20.0	0.003	8.4	LOS A	0.0	0.1	0.01	0.66	0.01	67.7
9	R2	1	10.0	0.003	7.7	LOS A	0.0	0.1	0.01	0.66	0.01	70.4
Approach		6	18.3	0.003	8.3	LOS A	0.0	0.1	0.01	0.66	0.01	68.1
West: Gidley Siding Road												
10	L2	1	10.0	0.001	8.1	LOS A	0.0	0.0	0.00	0.34	0.00	76.7
11	T1	1	10.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	90.3
Approach		2	10.0	0.001	4.0	NA	0.0	0.0	0.00	0.34	0.00	82.9
All Vehicles		44	18.8	0.017	7.4	NA	0.1	0.7	0.02	0.62	0.02	69.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ Gldley Siding Road Existing 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

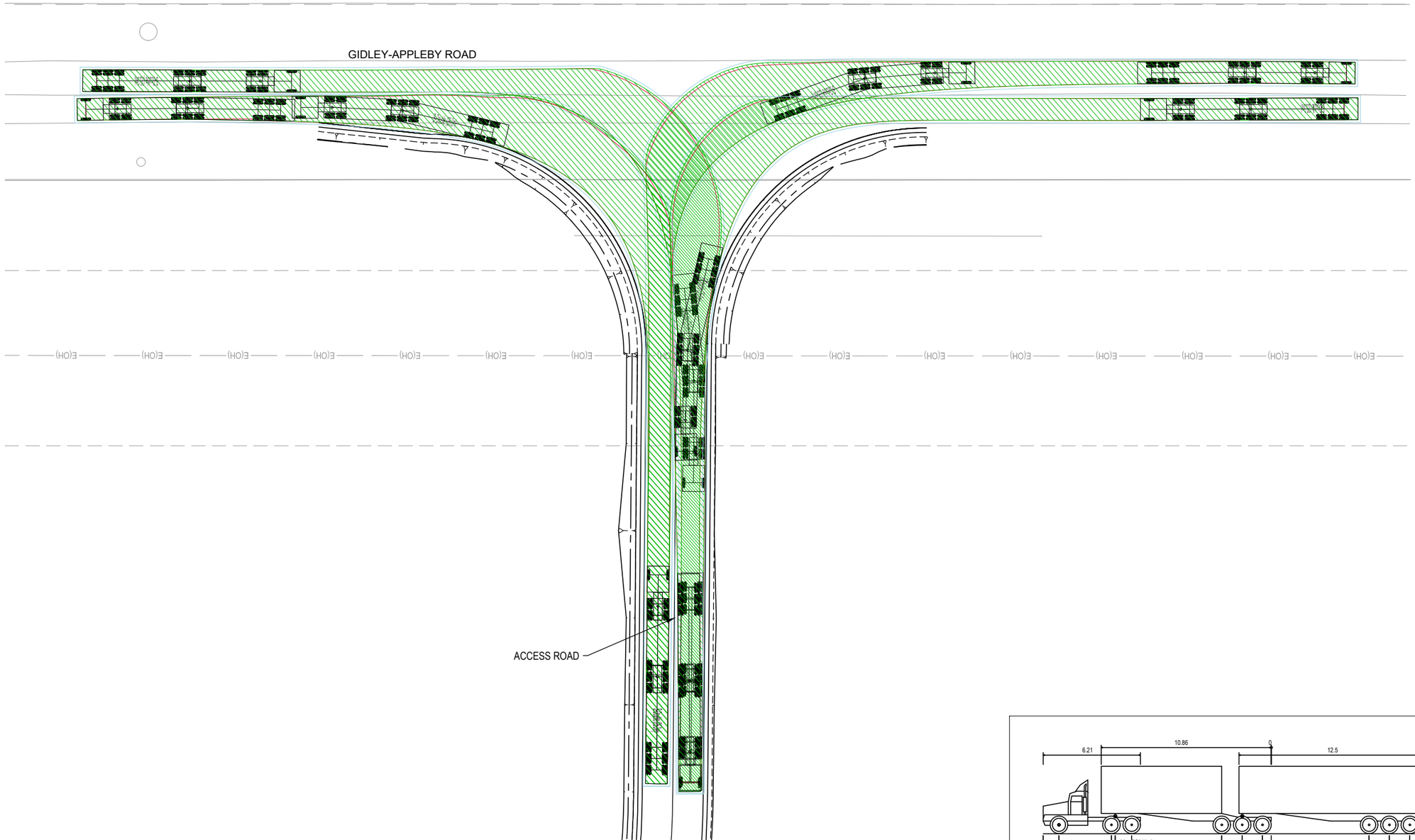
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	36	20.0	0.023	8.4	LOS A	0.0	0.0	0.00	0.64	0.00	67.9
2	T1	1	10.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.64	0.00	82.8
Approach		37	19.7	0.023	8.1	NA	0.0	0.0	0.00	0.64	0.00	68.3
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.02	0.65	0.02	71.9
9	R2	1	10.0	0.001	7.7	LOS A	0.0	0.0	0.02	0.65	0.02	71.3
Approach		2	10.0	0.001	7.3	LOS A	0.0	0.0	0.02	0.65	0.02	71.6
West: Gidley Siding Road												
10	L2	1	10.0	0.004	8.1	LOS A	0.0	0.2	0.01	0.67	0.01	71.2
12	R2	6	20.0	0.004	8.0	LOS A	0.0	0.2	0.01	0.67	0.01	67.2
Approach		7	18.6	0.004	8.0	NA	0.0	0.2	0.01	0.67	0.01	67.8
All Vehicles		46	19.1	0.023	8.1	NA	0.0	0.2	0.00	0.65	0.00	68.3

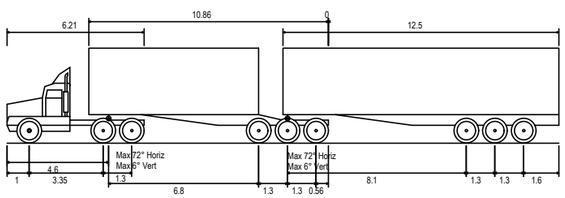
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C

Swept Paths

NORTH





B-Double (25.0m)

Overall Length	25.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1125; SY19093-X1850; SY19093-X1101; SY19093-X1500

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
B	ISSUE FOR DA APPROVAL	T. LEWIS	T. LEWIS	A. BUCKLEY	23/09/2019
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

APPROVED

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SIGNED

DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

5 0 5 10 15 20

SCALE IN METRES - 1:500

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ABN 67 140 184 309

CLIENT TAMWORTH REGIONAL COUNCIL

PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 1

DATUMS: AHD / MGA

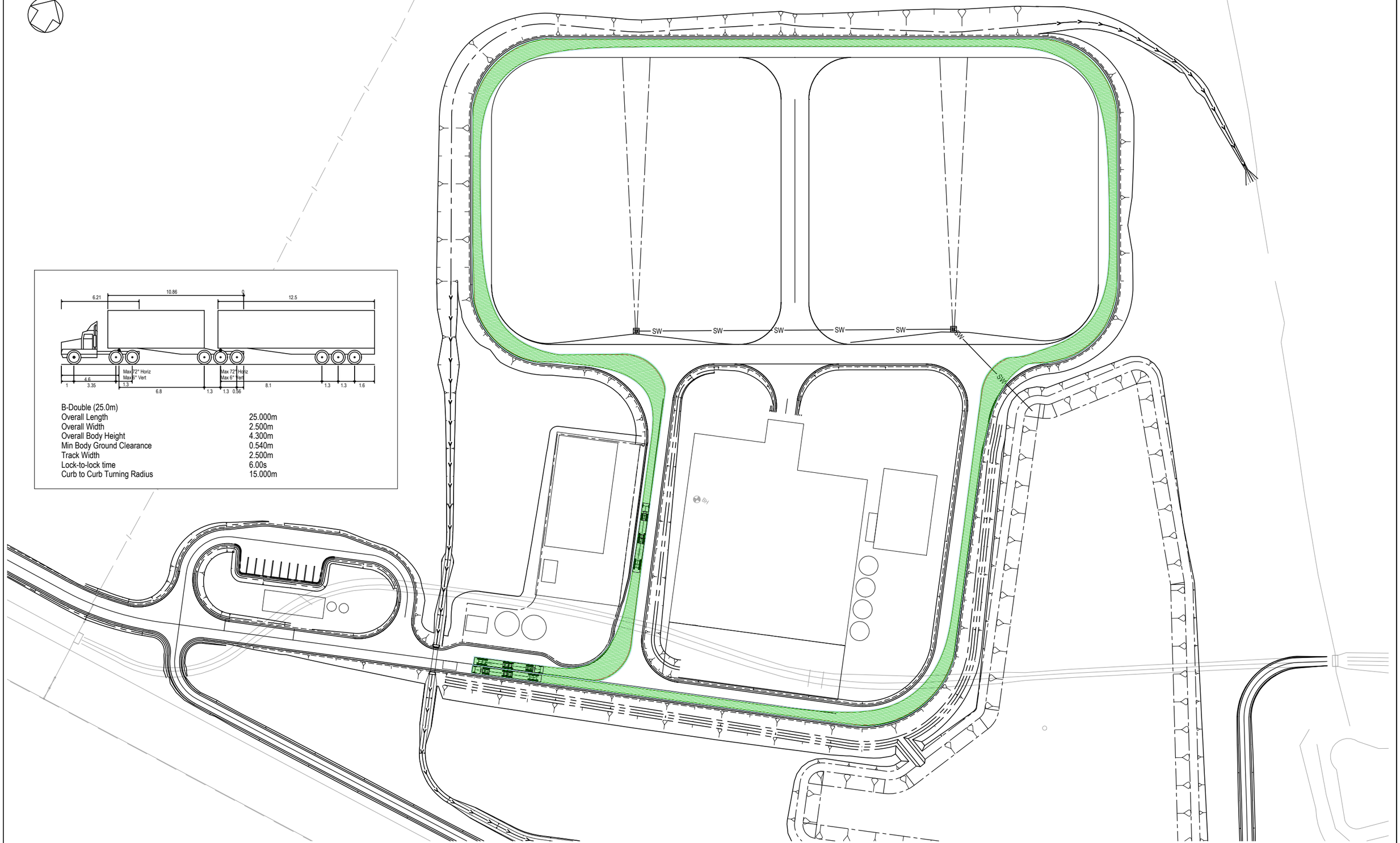
CLIENT No. -

DRAWING No. SY19093-C11

REVISION B

Sep. 23, 19 - 10:27:07 Name: SY19093-C11.dwg Updated By: Tristan Lewis

B-Double (25.0m)	
Overall Length	25.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



REFERENCE FILES ATTACHED: SY19093-X1500; SY19093-X1100; SY19093-X1850; SY19093-X1101; SY19093-X1125

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
A	ISSUE FOR DA APPROVAL	R. NG	T. LEWIS	A. BUCKLEY	13/09/2019

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DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

12.5 0 12.5 25 37.5 50

SCALE IN METRES - 1:1250

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PROJECT ENGINEERING DESIGN FOR TUNNEL COMPOSTING ORF

STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 3

DATUMS: AHD / MGA

CLIENT No. -

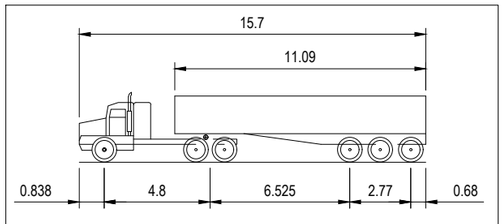
DRAWING No. SY19093-C13

REVISION A

Sep. 13, 19 - 08:39:46 Name: SY19093-C13.dwg Updated By: Rachel Ng

NORTH

RECEIVALS AND PROCESSING SHED



Prime mover and Chassis Tipper (15.7 m)	
Overall Length	15.700m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REFERENCE FILES ATTACHED: SY19093-X1100; SY19093-X1125; SY19093-X1850; SY19093-X1500

P&S FORM DRG-A3 REV - 8

DRAWING REVISION HISTORY

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
B	ISSUE FOR DA APPROVAL	T. LEWIS	T. LEWIS	A. BUCKLEY	23/09/2019
A	ISSUE FOR DA APPROVAL	T. LEWIS	T. LEWIS	A. BUCKLEY	19/09/2019

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DATE

SCALE (PLOTTED FULL SIZE) AS SHOWN (A3)

SHEET SIZE A3

5 0 5 10 15 20

SCALE IN METRES - 1:500

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STATUS **PRELIMINARY**

DRAWING TITLE VEHICLE SWEPT PATH SHEET 4

DATUMS: AHD / MGA

CLIENT No. -

DRAWING No. SY19093-C14

REVISION B

Sep. 23, 19 - 10:05:39 Name: SY19093-C14.dwg Updated By: Tristan Lewis

Appendix D

Post Development SIDRA Results

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Post Development 2029 AM Peak]

08:00-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	114	20.0	0.073	0.1	LOS A	0.1	0.6	0.05	0.05	0.05	98.1
3	R2	8	30.0	0.073	8.9	LOS A	0.1	0.6	0.05	0.05	0.05	72.8
Approach		122	20.7	0.073	0.7	NA	0.1	0.6	0.05	0.05	0.05	95.8
East: Appleby Lane												
4	L2	11	10.0	0.021	8.4	LOS A	0.1	0.6	0.25	0.62	0.25	69.7
6	R2	17	10.0	0.021	8.7	LOS A	0.1	0.6	0.25	0.62	0.25	69.5
Approach		27	10.0	0.021	8.6	LOS A	0.1	0.6	0.25	0.62	0.25	69.6
North: Oxley Highway												
7	L2	15	10.0	0.009	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	129	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		144	10.0	0.071	0.8	NA	0.0	0.0	0.00	0.07	0.00	95.9
All Vehicles		294	14.4	0.073	1.5	NA	0.1	0.6	0.04	0.11	0.04	92.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Post Development 2029 AM Peak]

08:0-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	8	10.0	0.032	8.1	LOS A	0.1	0.8	0.08	0.65	0.08	70.9
2	T1	1	10.0	0.032	7.0	LOS A	0.1	0.8	0.08	0.65	0.08	71.0
3	R2	28	40.0	0.032	8.7	LOS A	0.1	0.8	0.08	0.65	0.08	60.9
Approach		38	32.5	0.032	8.5	LOS A	0.1	0.8	0.08	0.65	0.08	63.2
East: Appleby Lane												
4	L2	21	10.0	0.022	8.1	LOS A	0.0	0.1	0.01	0.38	0.01	76.0
5	T1	17	5.0	0.022	0.0	LOS A	0.0	0.1	0.01	0.38	0.01	89.3
6	R2	1	10.0	0.022	7.7	LOS A	0.0	0.1	0.01	0.38	0.01	75.4
Approach		39	7.8	0.022	4.6	NA	0.0	0.1	0.01	0.38	0.01	81.2
North: Evans Lane												
7	L2	2	10.0	0.003	8.1	LOS A	0.0	0.1	0.06	0.63	0.06	71.1
8	T1	1	10.0	0.003	7.0	LOS A	0.0	0.1	0.06	0.63	0.06	71.2
9	R2	1	10.0	0.003	7.8	LOS A	0.0	0.1	0.06	0.63	0.06	70.5
Approach		4	10.0	0.003	7.8	LOS A	0.0	0.1	0.06	0.63	0.06	71.0
West: Appleby Lane												
10	L2	1	10.0	0.014	8.2	LOS A	0.0	0.3	0.07	0.21	0.07	78.6
11	T1	18	10.0	0.014	0.0	LOS A	0.0	0.3	0.07	0.21	0.07	93.0
12	R2	7	10.0	0.014	7.8	LOS A	0.0	0.3	0.07	0.21	0.07	78.0
Approach		26	10.0	0.014	2.5	NA	0.0	0.3	0.07	0.21	0.07	87.6
All Vehicles		107	17.2	0.032	5.6	NA	0.1	0.8	0.05	0.44	0.05	74.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Post Development 2029 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	20	20.0	0.073	8.4	LOS A	0.0	0.0	0.00	0.11	0.00	76.9
2	T1	105	20.0	0.073	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	96.6
Approach		125	20.0	0.073	1.3	NA	0.0	0.0	0.00	0.11	0.00	92.8
North: Manilla Road												
8	T1	203	10.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
9	R2	17	10.0	0.008	8.0	LOS A	0.0	0.3	0.25	0.59	0.25	69.6
Approach		220	10.0	0.111	0.6	NA	0.0	0.3	0.02	0.05	0.02	96.7
West: Appleby lane												
10	L2	14	30.0	0.044	9.0	LOS A	0.2	1.2	0.27	0.66	0.27	63.8
12	R2	37	10.0	0.044	8.8	LOS A	0.2	1.2	0.27	0.66	0.27	69.4
Approach		51	15.4	0.044	8.9	LOS A	0.2	1.2	0.27	0.66	0.27	67.8
All Vehicles		396	13.9	0.111	1.9	NA	0.2	1.2	0.04	0.14	0.04	90.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Post Development 2029 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	1	10.0	0.010	0.0	LOS A	0.1	0.4	0.03	0.63	0.03	83.7
6	R2	20	20.0	0.010	8.0	LOS A	0.1	0.4	0.03	0.63	0.03	67.8
Approach		21	19.5	0.010	7.6	NA	0.1	0.4	0.03	0.63	0.03	68.4
North: Gidley Appleby Road												
7	L2	27	20.0	0.015	8.4	LOS A	0.1	0.6	0.02	0.65	0.02	67.5
9	R2	1	10.0	0.015	7.7	LOS A	0.1	0.6	0.02	0.65	0.02	70.3
Approach		28	19.6	0.015	8.3	LOS A	0.1	0.6	0.02	0.65	0.02	67.6
West: Gidley Siding Road												
10	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.00	0.23	0.00	78.8
11	T1	2	10.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	93.3
Approach		3	10.0	0.002	2.7	NA	0.0	0.0	0.00	0.23	0.00	87.9
All Vehicles		53	19.0	0.015	7.7	NA	0.1	0.6	0.02	0.62	0.02	68.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ GIdley Siding Road Post Development 2029 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	21	20.0	0.014	8.4	LOS A	0.0	0.0	0.00	0.63	0.00	68.1
2	T1	1	10.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.63	0.00	83.1
Approach		22	19.5	0.014	8.0	NA	0.0	0.0	0.00	0.63	0.00	68.7
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.06	0.63	0.06	71.7
9	R2	1	10.0	0.001	7.7	LOS A	0.0	0.0	0.06	0.63	0.06	71.1
Approach		2	10.0	0.001	7.3	LOS A	0.0	0.0	0.06	0.63	0.06	71.4
West: Gidley Siding Road												
10	L2	1	10.0	0.014	8.1	LOS A	0.1	0.6	0.01	0.67	0.01	71.3
12	R2	29	20.0	0.014	8.0	LOS A	0.1	0.6	0.01	0.67	0.01	67.3
Approach		31	19.7	0.014	8.0	NA	0.1	0.6	0.01	0.67	0.01	67.4
All Vehicles		55	19.2	0.014	7.9	NA	0.1	0.6	0.01	0.65	0.01	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Post Development 2029 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	138	20.0	0.086	0.0	LOS A	0.1	0.5	0.04	0.03	0.04	98.6
3	R2	7	30.0	0.086	8.9	LOS A	0.1	0.5	0.04	0.03	0.04	73.1
Approach		145	20.5	0.086	0.5	NA	0.1	0.5	0.04	0.03	0.04	96.9
East: Appleby Lane												
4	L2	9	10.0	0.015	8.4	LOS A	0.1	0.4	0.24	0.62	0.24	69.7
6	R2	11	10.0	0.015	8.8	LOS A	0.1	0.4	0.24	0.62	0.24	69.5
Approach		20	10.0	0.015	8.6	LOS A	0.1	0.4	0.24	0.62	0.24	69.6
North: Oxley Highway												
7	L2	18	10.0	0.010	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	131	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		148	10.0	0.071	1.0	NA	0.0	0.0	0.00	0.08	0.00	95.2
All Vehicles		314	14.9	0.086	1.2	NA	0.1	0.5	0.03	0.09	0.03	93.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Post Development 2029 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	9	10.0	0.048	8.1	LOS A	0.1	1.2	0.07	0.65	0.07	71.0
2	T1	1	10.0	0.048	6.9	LOS A	0.1	1.2	0.07	0.65	0.07	71.1
3	R2	46	40.0	0.048	8.6	LOS A	0.1	1.2	0.07	0.65	0.07	61.0
Approach		57	34.4	0.048	8.5	LOS A	0.1	1.2	0.07	0.65	0.07	62.6
East: Appleby Lane												
4	L2	16	10.0	0.016	8.1	LOS A	0.0	0.1	0.01	0.40	0.01	75.7
5	T1	12	5.0	0.016	0.0	LOS A	0.0	0.1	0.01	0.40	0.01	88.9
6	R2	1	10.0	0.016	7.7	LOS A	0.0	0.1	0.01	0.40	0.01	75.1
Approach		28	8.0	0.016	4.8	NA	0.0	0.1	0.01	0.40	0.01	80.5
North: Evans Lane												
7	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.06	0.63	0.06	71.3
8	T1	1	10.0	0.002	7.0	LOS A	0.0	0.0	0.06	0.63	0.06	71.4
9	R2	1	10.0	0.002	7.8	LOS A	0.0	0.0	0.06	0.63	0.06	70.7
Approach		3	10.0	0.002	7.6	LOS A	0.0	0.0	0.06	0.63	0.06	71.1
West: Appleby Lane												
10	L2	1	10.0	0.011	8.2	LOS A	0.0	0.2	0.06	0.23	0.06	78.3
11	T1	14	10.0	0.011	0.0	LOS A	0.0	0.2	0.06	0.23	0.06	92.6
12	R2	6	10.0	0.011	7.7	LOS A	0.0	0.2	0.06	0.23	0.06	77.7
Approach		21	10.0	0.011	2.7	NA	0.0	0.2	0.06	0.23	0.06	86.8
All Vehicles		109	22.2	0.048	6.4	NA	0.1	1.2	0.05	0.51	0.05	70.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Post Development 2029 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	22	20.0	0.114	8.4	LOS A	0.0	0.0	0.00	0.08	0.00	77.5
2	T1	173	20.0	0.114	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	97.6
Approach		195	20.0	0.114	1.0	NA	0.0	0.0	0.00	0.08	0.00	94.8
North: Manilla Road												
8	T1	126	10.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	11	10.0	0.006	8.2	LOS A	0.0	0.2	0.32	0.58	0.32	69.3
Approach		137	10.0	0.069	0.6	NA	0.0	0.2	0.02	0.04	0.02	96.7
West: Appleby lane												
10	L2	32	30.0	0.056	9.2	LOS A	0.2	1.7	0.31	0.65	0.31	63.5
12	R2	37	10.0	0.056	8.8	LOS A	0.2	1.7	0.31	0.65	0.31	69.1
Approach		68	19.2	0.056	9.0	LOS A	0.2	1.7	0.31	0.65	0.31	66.4
All Vehicles		400	16.4	0.114	2.2	NA	0.2	1.7	0.06	0.16	0.06	88.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Post Development 2029 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	2	10.0	0.023	0.0	LOS A	0.1	1.0	0.02	0.64	0.02	83.6
6	R2	46	20.0	0.023	8.0	LOS A	0.1	1.0	0.02	0.64	0.02	67.7
Approach		48	19.6	0.023	7.6	NA	0.1	1.0	0.02	0.64	0.02	68.3
North: Gidley Appleby Road												
7	L2	5	20.0	0.003	8.4	LOS A	0.0	0.1	0.01	0.66	0.01	67.7
9	R2	1	10.0	0.003	7.7	LOS A	0.0	0.1	0.01	0.66	0.01	70.4
Approach		6	18.3	0.003	8.3	LOS A	0.0	0.1	0.01	0.66	0.01	68.1
West: Gidley Siding Road												
10	L2	1	10.0	0.001	8.1	LOS A	0.0	0.0	0.00	0.34	0.00	76.7
11	T1	1	10.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	90.3
Approach		2	10.0	0.001	4.0	NA	0.0	0.0	0.00	0.34	0.00	82.9
All Vehicles		57	19.1	0.023	7.5	NA	0.1	1.0	0.02	0.63	0.02	68.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ GIdley Siding Road Post Development 2029 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	48	20.0	0.030	8.4	LOS A	0.0	0.0	0.00	0.65	0.00	67.8
2	T1	1	10.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.65	0.00	82.7
Approach		49	19.8	0.030	8.2	NA	0.0	0.0	0.00	0.65	0.00	68.1
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.02	0.65	0.02	71.9
9	R2	1	10.0	0.001	7.8	LOS A	0.0	0.0	0.02	0.65	0.02	71.3
Approach		2	10.0	0.001	7.3	LOS A	0.0	0.0	0.02	0.65	0.02	71.6
West: Gidley Siding Road												
10	L2	1	10.0	0.004	8.1	LOS A	0.0	0.2	0.01	0.67	0.01	71.2
12	R2	6	20.0	0.004	8.0	LOS A	0.0	0.2	0.01	0.67	0.01	67.2
Approach		7	18.6	0.004	8.0	NA	0.0	0.2	0.01	0.67	0.01	67.8
All Vehicles		59	19.3	0.030	8.1	NA	0.0	0.2	0.00	0.65	0.00	68.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E

Construction Phase SIDRA Results

pitt&sherry

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Construction Phase 2019 AM Peak]

08:00-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	114	20.0	0.089	0.2	LOS A	0.2	1.8	0.13	0.13	0.13	94.8
3	R2	28	30.0	0.089	8.9	LOS A	0.2	1.8	0.13	0.13	0.13	71.0
Approach		142	22.0	0.089	1.9	NA	0.2	1.8	0.13	0.13	0.13	88.9
East: Appleby Lane												
4	L2	36	10.0	0.033	8.4	LOS A	0.1	1.0	0.23	0.62	0.23	69.7
6	R2	14	10.0	0.033	8.8	LOS A	0.1	1.0	0.23	0.62	0.23	69.5
Approach		49	10.0	0.033	8.5	LOS A	0.1	1.0	0.23	0.62	0.23	69.6
North: Oxley Highway												
7	L2	17	10.0	0.010	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	129	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		146	10.0	0.071	0.9	NA	0.0	0.0	0.00	0.08	0.00	95.4
All Vehicles		338	15.0	0.089	2.5	NA	0.2	1.8	0.09	0.18	0.09	87.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Construction Phase 2019 AM Peak]

08:0-09:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	38	10.0	0.089	8.1	LOS A	0.3	2.5	0.07	0.65	0.07	70.8
2	T1	1	10.0	0.089	7.0	LOS A	0.3	2.5	0.07	0.65	0.07	70.9
3	R2	73	40.0	0.089	8.8	LOS A	0.3	2.5	0.07	0.65	0.07	60.9
Approach		112	29.5	0.089	8.5	LOS A	0.3	2.5	0.07	0.65	0.07	64.0
East: Appleby Lane												
4	L2	28	10.0	0.026	8.1	LOS A	0.0	0.1	0.01	0.43	0.01	75.1
5	T1	17	5.0	0.026	0.0	LOS A	0.0	0.1	0.01	0.43	0.01	88.2
6	R2	1	10.0	0.026	7.7	LOS A	0.0	0.1	0.01	0.43	0.01	74.5
Approach		46	8.2	0.026	5.1	NA	0.0	0.1	0.01	0.43	0.01	79.4
North: Evans Lane												
7	L2	2	10.0	0.003	8.1	LOS A	0.0	0.1	0.06	0.64	0.06	71.1
8	T1	1	10.0	0.003	7.0	LOS A	0.0	0.1	0.06	0.64	0.06	71.2
9	R2	1	10.0	0.003	7.9	LOS A	0.0	0.1	0.06	0.64	0.06	70.6
Approach		4	10.0	0.003	7.8	LOS A	0.0	0.1	0.06	0.64	0.06	71.0
West: Appleby Lane												
10	L2	1	10.0	0.024	8.2	LOS A	0.1	0.8	0.13	0.39	0.13	74.7
11	T1	18	10.0	0.024	0.1	LOS A	0.1	0.8	0.13	0.39	0.13	87.6
12	R2	28	10.0	0.024	7.8	LOS A	0.1	0.8	0.13	0.39	0.13	74.1
Approach		47	10.0	0.024	4.9	NA	0.1	0.8	0.13	0.39	0.13	78.7
All Vehicles		209	20.0	0.089	7.0	NA	0.3	2.5	0.07	0.54	0.07	70.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Construction Phase 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	26	20.0	0.077	8.4	LOS A	0.0	0.0	0.00	0.14	0.00	76.4
2	T1	105	20.0	0.077	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	95.8
Approach		132	20.0	0.077	1.7	NA	0.0	0.0	0.00	0.14	0.00	91.2
North: Manilla Road												
8	T1	203	10.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
9	R2	18	10.0	0.009	8.0	LOS A	0.0	0.4	0.26	0.59	0.26	69.6
Approach		221	10.0	0.111	0.7	NA	0.0	0.4	0.02	0.05	0.02	96.5
West: Appleby lane												
10	L2	18	30.0	0.086	9.0	LOS A	0.3	2.3	0.29	0.68	0.29	63.7
12	R2	77	10.0	0.086	8.9	LOS A	0.3	2.3	0.29	0.68	0.29	69.3
Approach		95	13.8	0.086	8.9	LOS A	0.3	2.3	0.29	0.68	0.29	68.2
All Vehicles		447	13.7	0.111	2.7	NA	0.3	2.3	0.07	0.21	0.07	87.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Construction Phase 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	1	10.0	0.030	0.0	LOS A	0.2	1.4	0.03	0.65	0.03	83.2
6	R2	64	20.0	0.030	8.0	LOS A	0.2	1.4	0.03	0.65	0.03	67.4
Approach		65	19.8	0.030	7.8	NA	0.2	1.4	0.03	0.65	0.03	67.6
North: Gidley Appleby Road												
7	L2	27	20.0	0.015	8.4	LOS A	0.1	0.6	0.01	0.65	0.01	67.6
9	R2	1	10.0	0.015	7.8	LOS A	0.1	0.6	0.01	0.65	0.01	70.3
Approach		28	19.6	0.015	8.3	LOS A	0.1	0.6	0.01	0.65	0.01	67.7
West: Gidley Siding Road												
10	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.00	0.23	0.00	78.8
11	T1	2	10.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	93.3
Approach		3	10.0	0.002	2.7	NA	0.0	0.0	0.00	0.23	0.00	87.9
All Vehicles		97	19.5	0.030	7.8	NA	0.2	1.4	0.02	0.64	0.02	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ GIdley Siding Road Construction Phase 2019 AM Peak]

8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	65	20.0	0.041	8.4	LOS A	0.0	0.0	0.00	0.65	0.00	67.8
2	T1	1	10.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.65	0.00	82.6
Approach		66	19.8	0.041	8.2	NA	0.0	0.0	0.00	0.65	0.00	68.0
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.06	0.63	0.06	71.7
9	R2	1	10.0	0.001	7.8	LOS A	0.0	0.0	0.06	0.63	0.06	71.1
Approach		2	10.0	0.001	7.4	LOS A	0.0	0.0	0.06	0.63	0.06	71.4
West: Gidley Siding Road												
10	L2	1	10.0	0.014	8.1	LOS A	0.1	0.6	0.01	0.67	0.01	71.3
12	R2	29	20.0	0.014	8.0	LOS A	0.1	0.6	0.01	0.67	0.01	67.3
Approach		31	19.7	0.014	8.0	NA	0.1	0.6	0.01	0.67	0.01	67.4
All Vehicles		99	19.6	0.041	8.1	NA	0.1	0.6	0.01	0.66	0.01	67.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Oxley Highway/ Appleby Lane Construction Phase 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Oxley Highway												
2	T1	138	20.0	0.102	0.2	LOS A	0.2	1.8	0.11	0.11	0.11	95.6
3	R2	27	30.0	0.102	8.9	LOS A	0.2	1.8	0.11	0.11	0.11	71.4
Approach		165	21.7	0.102	1.6	NA	0.2	1.8	0.11	0.11	0.11	90.5
East: Appleby Lane												
4	L2	36	10.0	0.033	8.4	LOS A	0.1	1.0	0.23	0.62	0.23	69.7
6	R2	14	10.0	0.033	9.0	LOS A	0.1	1.0	0.23	0.62	0.23	69.5
Approach		49	10.0	0.033	8.6	LOS A	0.1	1.0	0.23	0.62	0.23	69.6
North: Oxley Highway												
7	L2	20	10.0	0.012	8.1	LOS A	0.0	0.0	0.00	0.66	0.00	70.9
8	T1	131	10.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		151	10.0	0.071	1.1	NA	0.0	0.0	0.00	0.09	0.00	94.8
All Vehicles		365	15.3	0.102	2.3	NA	0.2	1.8	0.08	0.17	0.08	88.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Appleby Road/ Appleby Lane/ Evans Lane Construction Phase 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Gidley Appleby Road												
1	L2	39	10.0	0.106	8.1	LOS A	0.3	2.9	0.06	0.66	0.06	70.9
2	T1	1	10.0	0.106	7.0	LOS A	0.3	2.9	0.06	0.66	0.06	71.0
3	R2	91	40.0	0.106	8.7	LOS A	0.3	2.9	0.06	0.66	0.06	61.0
Approach		131	30.8	0.106	8.5	LOS A	0.3	2.9	0.06	0.66	0.06	63.7
East: Appleby Lane												
4	L2	23	10.0	0.020	8.1	LOS A	0.0	0.1	0.01	0.45	0.01	74.6
5	T1	12	5.0	0.020	0.0	LOS A	0.0	0.1	0.01	0.45	0.01	87.5
6	R2	1	10.0	0.020	7.7	LOS A	0.0	0.1	0.01	0.45	0.01	74.1
Approach		36	8.4	0.020	5.5	NA	0.0	0.1	0.01	0.45	0.01	78.3
North: Evans Lane												
7	L2	1	10.0	0.002	8.1	LOS A	0.0	0.0	0.06	0.64	0.06	71.3
8	T1	1	10.0	0.002	7.0	LOS A	0.0	0.0	0.06	0.64	0.06	71.4
9	R2	1	10.0	0.002	7.9	LOS A	0.0	0.0	0.06	0.64	0.06	70.8
Approach		3	10.0	0.002	7.7	LOS A	0.0	0.0	0.06	0.64	0.06	71.1
West: Appleby Lane												
10	L2	1	10.0	0.021	8.2	LOS A	0.1	0.8	0.11	0.43	0.11	74.1
11	T1	14	10.0	0.021	0.1	LOS A	0.1	0.8	0.11	0.43	0.11	86.8
12	R2	28	10.0	0.021	7.8	LOS A	0.1	0.8	0.11	0.43	0.11	73.6
Approach		43	10.0	0.021	5.3	NA	0.1	0.8	0.11	0.43	0.11	77.3
All Vehicles		213	22.5	0.106	7.4	NA	0.3	2.9	0.06	0.58	0.06	68.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Manilla Road/ Appleby Lane Construction Phase 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manilla Road												
1	L2	28	20.0	0.118	8.4	LOS A	0.0	0.0	0.00	0.10	0.00	77.1
2	T1	173	20.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	97.0
Approach		201	20.0	0.118	1.2	NA	0.0	0.0	0.00	0.10	0.00	93.6
North: Manilla Road												
8	T1	126	10.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	12	10.0	0.006	8.2	LOS A	0.0	0.2	0.33	0.58	0.33	69.3
Approach		138	10.0	0.069	0.7	NA	0.0	0.2	0.03	0.05	0.03	96.4
West: Appleby lane												
10	L2	36	30.0	0.098	9.2	LOS A	0.4	2.8	0.32	0.68	0.32	63.5
12	R2	77	10.0	0.098	8.9	LOS A	0.4	2.8	0.32	0.68	0.32	69.1
Approach		113	16.4	0.098	9.0	LOS A	0.4	2.8	0.32	0.68	0.32	67.2
All Vehicles		452	16.0	0.118	3.0	NA	0.4	2.8	0.09	0.23	0.09	85.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gidley Siding Road/ Gidley Appleby Road Construction Phase 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gidley Siding Road												
5	T1	2	10.0	0.043	0.0	LOS A	0.2	2.0	0.02	0.65	0.02	83.3
6	R2	91	20.0	0.043	8.0	LOS A	0.2	2.0	0.02	0.65	0.02	67.5
Approach		93	19.8	0.043	7.8	NA	0.2	2.0	0.02	0.65	0.02	67.8
North: Gidley Appleby Road												
7	L2	5	20.0	0.003	8.4	LOS A	0.0	0.1	0.00	0.66	0.00	67.7
9	R2	1	10.0	0.003	7.8	LOS A	0.0	0.1	0.00	0.66	0.00	70.4
Approach		6	18.3	0.003	8.3	LOS A	0.0	0.1	0.00	0.66	0.00	68.1
West: Gidley Siding Road												
10	L2	1	10.0	0.001	8.1	LOS A	0.0	0.0	0.00	0.34	0.00	76.7
11	T1	1	10.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	90.3
Approach		2	10.0	0.001	4.0	NA	0.0	0.0	0.00	0.34	0.00	82.9
All Vehicles		101	19.5	0.043	7.7	NA	0.2	2.0	0.02	0.65	0.02	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Wallamore Road/ Gldley Siding Road Construction Phase 2019 PM Peak]

15:30-16:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallamore Road												
1	L2	93	20.0	0.058	8.4	LOS A	0.0	0.0	0.00	0.65	0.00	67.7
2	T1	1	10.0	0.058	0.0	LOS A	0.0	0.0	0.00	0.65	0.00	82.5
Approach		94	19.9	0.058	8.3	NA	0.0	0.0	0.00	0.65	0.00	67.9
North: Wallamore Road												
8	T1	1	10.0	0.001	6.9	LOS A	0.0	0.0	0.02	0.65	0.02	71.9
9	R2	1	10.0	0.001	7.8	LOS A	0.0	0.0	0.02	0.65	0.02	71.3
Approach		2	10.0	0.001	7.4	LOS A	0.0	0.0	0.02	0.65	0.02	71.6
West: Gidley Siding Road												
10	L2	1	10.0	0.004	8.1	LOS A	0.0	0.2	0.01	0.67	0.01	71.2
12	R2	6	20.0	0.004	8.0	LOS A	0.0	0.2	0.01	0.67	0.01	67.2
Approach		7	18.6	0.004	8.0	NA	0.0	0.2	0.01	0.67	0.01	67.8
All Vehicles		103	19.6	0.058	8.2	NA	0.0	0.2	0.00	0.65	0.00	67.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Tamworth Regional Council Organic Recycling Facility, Tamworth

Traffic Impact Assessment

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ref: SY19089H001 TIA Rep 31P Rev 01/LA/cy

Flora and Fauna Assessment

Appendix H

pitt&sherry

Tamworth Organics Recycling Facility - Flora and Fauna Assessment

Pitt & Sherry

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DOCUMENT TRACKING

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Template 2.8.1

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act
BDAR	Biodiversity Assessment Report
BOS	Biodiversity Offset Scheme
BV map	Biodiversity Values map
DoEE	Department of the Environment and Energy
ELA	Eco Logical Australia
EMP	Environment Management Plan
EP&A Act	Environmental Planning and Assessment Act
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPL	Environmental Protection License
FFA	Flora and Fauna Assessment
FM Act	Fisheries Management Act
HBTs	Hollow Bearing Trees
LLS Act	Local Land Services Act
NES	National Environmental Significance
NPW Act	National Parks and Wildlife Act
OEH	Office of Environment and Heritage
ORF	Organic Recycling Facility
PCT	Plant Community Type
POEO Act	Protection of the Environment Operations Act
RSWMP	Regional Strategic Weed Management Plan
SEPP	State Environment Planning Policy
WM Act	Water Management Act

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Pitt & Sherry to prepare a Biodiversity Assessment for impacts associated with the construction and operation of the Tamworth Organics Recycling Facility (ORF) proposed by Tamworth Regional Council. The assessment considers the ecological constraints of the proposed alignment on threatened species, populations and communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), *NSW Fisheries Management Act 1994* (FM Act), and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

ELA undertook a database review and site inspection, to determine the extent of native vegetation present and to inform an assessment of potential impacts to threatened species, their habitat and ecological communities. One vegetation community was present within the study area, PCT 516 – Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion. All other areas within the study area were cleared land. Following site inspection and consultation with Pitt & Sherry it became clear that the Biodiversity Offset Scheme (BOS) under the BC Act would not be triggered as described in the table below.

BOS trigger	Minimum threshold	Outcome
Area of native vegetation cleared	Minimum lot size is 100 ha therefore minimum threshold is more than 1 ha of vegetation	Less than 1 ha of native vegetation cleared, therefore BOS not triggered
Site mapped on Biodiversity Values (BV) Map	Any areas identified on BV map	Site not identified on BV map, therefore BOS not triggered
Significant impact to threatened species, populations, or ecological communities	Any significant impacts as described under 7.3 of the BC Act	No significant impact, therefore BOS not triggered
Impacts to Areas of Outstanding Biodiversity Value (AoBV)	The area is located within a registered AoBV	No AoBV onsite, therefore BOS not triggered

Potential habitat for threatened species, communities and populations was assessed during the field survey and results are presented in a species likelihood assessment (Appendix B). The assessment indicated that one threatened fauna species had the potential to occur on site. However, the 'test of significance' under section 7.3 of the BC Act determined no significant impact on threatened species, population or communities and therefore a Biodiversity Assessment Development Report (BDAR) is not required and the BOS was not triggered.

As the BOS thresholds were not triggered, a Flora and Fauna Assessment (FFA) has been prepared to assess the impacts on biodiversity of the proposed development. An assessment for EPBC Act listed species has also been undertaken in accordance with Significant Impact Criteria in the Significant Impact Guidelines 1.1 (Department of the Environment 2013). These concluded that significant impact is not likely to result and therefore a referral to the Commonwealth Department of Environment and Energy is not required.

Mitigation measures and recommendations have been provided to reduce impacts to threatened species and ecological communities within and adjacent to the study area (Section 5).

1. Introduction

Eco Logical Australia Pty Ltd (ELA) was commissioned by Pitt & Sherry on behalf of Tamworth Regional Council to prepare a Biodiversity Assessment for impacts associated with the construction of an Organic Recycling Facility, including approximately 11 ha for the ORF subject site (development footprint) as shown in Figure 1.

The study area is located on 284 Gidley-Appleby Road, Gidley within the Tamworth Regional Local Government Area, New South Wales. The property is currently zoned as RU1 (Primary Production) and has historically been used for cropping and grazing. Vegetation within the site reflects the current and past land use, with much of the area being cleared and modified for pasture, accompanied by sparse paddock trees, with few existing areas of remnant woodland (Figure 2).

The aim of this report is to address impacts to threatened species and habitat, ecological communities and populations listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1994* (FM Act), and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that occur within the study area.

Figure 1: Proposed Tamworth Organics Recycling Facility site

Figure 2 Typical landscape found throughout the study area.

1.1 Scope of works

Tamworth Regional Council proposes to construct and operate a Closed Tunnel Organic Recycling Facility within the Study area

The construction phase proposes to clear up to 11 ha of land within the Subject site for the ORF infrastructure and associated tracks. Site excavation will be completed to construct a leachate dam which will accommodate 16 ML of potential run-off that is generated once in operation. The construction of impermeable working pads for the compost processing areas and other structures will also be completed within this phase.

All works will be undertaken during standard construction hours:

- 7am to 6pm Monday to Friday. current
- 8am to 1pm Saturday.
- No works on Sundays or public holidays.

Once in operation several processes will be conducted to achieve the final product.

All material received will be stored into a large enclosed receivals shed, or liquid waste tanks for processing. The shed will be fully closed with automatic closing access doors to reduce dust, odour and

litter. Materials will be screened, shredded and mixed before being loaded into the tunnels for pasteurisation. The facility will utilise a two-stage tunnel composting process comprising 28 days residence time (2 x 14 days) to guarantee pasteurisation. The output would be a complete pasteurised material free of offensive odour. The biological activities in this pasteurised product will have significantly declined allowing outside maturation. The raw compost from the tunnels will be transported by front end loader to the maturation area in stockpiles and allowed to mature for up to 6 to 8 weeks with windrow moistening if required.

The composting process will be monitored in accordance with framework provided by AS4454 and an Environmental Management System (EMS) approved by Tamworth Regional Council and the NSW EPA. Material sampling, quality testing, field testing and operational auditing will also be undertaken.

The proposed facility has been designed to securely store all organics, contaminated products, wastes and process residues that cannot be beneficially processed at the facility, until they can be disposed of at a suitably licenced facility.

The proposed ORF will produce various grades of soil conditioners and composted mulches, such as:

- <10mm composted soil conditioner.
- 10-20mm composted fine mulch.
- 20-30mm composted mulch.

On completion of the composting process the batches will be moved to the product storage area where the product will be screened, sampled and tested.

1.2 Key terms

The following terminology has been used in this report:

- Subject site: the area to be directly affected by the proposal.
- Study area: the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly.
- Locality: The locality is defined by a 5 kilometre radius around the study area for the purposes of conducting database searches.

2. Statutory and Planning Context

2.1 Commonwealth legislation

2.1.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act protects Matters of National Environmental Significance (MNES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others).

Any actions that will, or are likely to, have a significant impact on the MNES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth (reference http://www.environment.gov.au/epbc/guidelines-policies.html) for MNES.

MNES have been identified on and near the site. An assessment of the activity has been undertaken in accordance with *Significant Impact Criteria in the Significant Impact Guidelines 1.1* (Department of the Environment 2013). These concluded that significant impact is not likely to result and therefore a referral to the Commonwealth Department of Environment is not required.

2.2 NSW Legislation

2.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of proposals.

As an activity that is permitted with consent, the Proposal shall be assessed under Division 4.1 of the EP&A Act. Division 4.8 of the EP&A Act identifies the proposal as integrated development, as an environmental protection licence is required under the Protection of the Environment Operations Act, 1997.

2.2.2 Environmental Planning and Assessment Regulation 2000 (EP&A Regulation)

The proposed development is designated development under Schedule 3 of the EP&A Regulation. An Environmental Impacts Statement (EIS) is required to be submitted to Council for any such development application, taking into account to the fullest extent possible, all matters which are likely to affect the environment. This FFA is intended to assist, and ensure the proposed development meets the requirements of clause 228 of the EP&A Regulations.

2.2.3 State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)

State Environmental Planning Policy (Infrastructure) 2007 applies to the proposed development. The aim of this Policy is to facilitate the effective delivery of infrastructure across NSW by identifying whether certain types of infrastructure require consent, can be carried out without consent, or are exempt development.

Under the provisions of the SEPP, development for the purposes of a waste or resource management facility is permissible within the RU1 Primary Production zone, subject meeting the pre-determined requirements under clause 123. The proposal complies with the relevant requirements of the SEPP and is permissible subject to development consent from Council.

2.2.4 State Environmental Planning Policy No 44 (Koala Habitat)

SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for *Phascolarctos cinereus* (Koala) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline.

Tamworth Regional Council is listed as one of the Councils in which SEPP 44 applies. Councils are encouraged to prepare LGA-wide Koala plans of management, and once agreed to by the NSW Department of Planning, they may be used by developers to address Koala issues and individual plans of management would no longer be required. Currently, potential and core koala habitat has not been surveyed in the Tamworth Regional Council LGA, or included as a special provision in the *Tamworth Regional Local Environmental Plan* (LEP) *2010*, or the *Tamworth Regional Development Control Plan 2010*.

Potential koala habitat is defined as areas of native vegetation (>1 ha) where the trees types listed in Schedule 2 of SEPP 44 constitute at least 15% of the total number of trees in the upper and lower strata. Core Koala habitat is defined as an area of land with a resident population of Koalas, evidenced by attributes such as breeding females and recent sightings and historical records of a population.

Although the development site does not fit the definition of 'potential koala habitat' as described above, one koala feed tree (*Eucalyptus moluccana*) is present across the study area, and a record of occurrence was found approximately 1.5 km north east of the study area boundary using NSW atlas of wildlife search tool. Therefore, 'tests of significance' were undertaken under both the BC and EPBC acts, which determined no significant impact to the Koala is likely to occur from the proposed development

2.2.5 Biodiversity Conservation Act 2016 (BC Act)

Part 7 of the BC Act provides the environmental assessment requirements for activities being assessed under Part 4 of the EP&A Act. If a significant impact is likely, the environmental assessment is to be accompanied by a BDAR. Section 7.2(1)(a) and 7.3 of this document describe the assessment requirements and thresholds for what is considered a significant impact.

Threatened species and communities listed under this Act were identified as potentially being impacted by the works. Assessments of Significance were undertaken for these matters and concluded that a significant impact is not likely to result and therefore a BDAR is not required.

The BOS under the BC Act may be applicable to the development if the BOS thresholds are triggered. This would then require application of the BAM and a BDAR to be prepared by an accredited assessor. The triggers for a BDAR are as follows:

- Area clearing threshold: For a minimum lot size of 40 ha to less than 1,000 ha, the BOS will be triggered by clearing of one hectare (ha) or more of native vegetation.
- NSW Government Biodiversity Values Map (BV Map). The BOS will be triggered if the land identified for clearing is mapped on the BV Map.
- Significant impact to threatened species, populations, or ecological communities. Any significant impacts as described under 7.3 of the BC Act
- The area is located within a registered Area of Outstanding Biodiversity Value.

As the above BOS thresholds were not triggered, a Flora and Fauna Assessment (FFA) has been prepared to assess the impacts on biodiversity of the proposed development. The 'test of significance' under section 7.3 of the BC Act determined no significant impacts on threatened species, population or communities and therefore the BOS was not triggered.

2.2.6 Fisheries Management Act 1995 (FM Act)

FM Act provides for the protection, conservation, and recovery of threatened species, populations and ecological communities of fish and marine vegetation and fish habitats, as well as promoting the development and sharing of fishery resources in NSW.

No threatened aquatic species or their habitat have been identified within the proposed works area. Furthermore, the activity does not involve harm to mangroves or other protected marine vegetation, dredging or reclamation, blocking of fish passage and does not involve impact to a Key Fish Habitat waterway. Therefore, the works will not require a permit issued by the Minister in accordance with Part 7 of the FM Act.

2.2.7 Local Land Services Act 2013 (LLS Act)

The objectives of the Act include 'to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development. The Act regulates the clearing of native vegetation, however section 60(O)(b)(ii) excludes the need for consent under the LLS Act where the clearing is an activity carried out by a determining authority within the meaning of Part 4 of the EP&A Act.

2.2.8 Biosecurity Act 2015

The Act has repealed the *Noxious Weeds Act 1993*. The Act provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

Whilst the Act provides for all biosecurity risks, implementation of the Act for weeds is supported by Regional Strategic Weed Management Plans (RSWMP) developed for each region in NSW.

Appendix 1 of the North West Regional Strategic Weed Management Plan 2017-2022 identifies the priority weeds for control at a regional scale. This is addressed in Section 4.1.2

2.2.9 National Parks and Wildlife Act 1974 (NPW ACT)

The NPW Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others).

The main aim of the Act is to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required.

Due to the high levels of previous disturbance displayed in this area (see Section 4.1.1) Aboriginal objects and sites are unlikely to be present within the area of proposed works. Therefore, further works in the form of an Aboriginal Cultural Heritage Assessment (ACHA) is not required.

A requirement of Clause 16 of the Infrastructure SEPP is for consultation with the National Parks and Wildlife Service (NPWS) where the proposed works occur on or adjacent to National Parks Estate. The proposed works are not within or adjacent to national park and therefore consultation is not required.

2.2.10 Heritage Act 1977

The proposed activity does not involve an item or place listed on the NSW State Heritage Register or the subject of an interim heritage order or listing and is therefore not a controlled activity. Approval of works on the site is therefore not required under Part 4 of the Heritage Act.

2.2.11 Protection of the Environment Operations Act 1997 (POEO ACT)

The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the NSW EPA and establishes a licensing regime for waste, air, water and pollution. Relevant sections of the Act are listed below:

Part 5.3 Water Pollution
Part 5.4 Air Pollution
Part 5.5 Noise Pollution
Part 5.6 Land Pollution and Waste.

Composting is a scheduled activity under Schedule 1 of the POEO Act. Relevant licences must be obtained in accordance with subsection 43 of the POEO Act.

2.2.12 Water Management Act 2000 (WM Act)

The WM Act's main objective is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 91E of the Act establishes an approval regime for controlled activities within waterfront land, however, clause 41 of the *Water Management (General) Regulation 2018* provides an exemption for public authorities in relation to all controlled activities on waterfront land. Therefore, approval under the WM Act is not required.

2.2.13 Roads Act 1993 (Roads Act)

Section 88 of the Roads Act states that a roads authority may, despite any other Act or law to the contrary, remove or lop any tree or other vegetation that is on or overhanging a public road if, in its opinion, it is necessary to do so for the purposes of carrying out road work or removing a traffic hazard.

Section 138 of the Roads Act sets out the requirement for approval to carry out certain works within the vicinity of a road. Under section 138 a person must not, without consent of the appropriate roads authority:

- Erect a structure or carry out a work in, on or over a public road;
- Dig up or disturb the surface of a public road;
- Remove or interfere with a structure, work or tree on a public road;
- Pump water into a public road from any land adjoining the road; and/or
- Connect a road (whether public or private) to a classified road.

Tamworth Regional Council is the roads authority for Appleby Gidley Rd. Therefore, approval under section 138 of the Roads Act is not required.

3. Methods

3.1 Flora and fauna assessment methods

The flora and fauna impact assessment methodology included a literature review and a field survey. The field survey was undertaken by a qualified ecologist to validate information gathered from the literature review and gather any new information relevant to the site. This included validating the extent and quality of any identified threatened ecological communities, identifying any potential threatened species or populations, and potential habitat for these species or populations, and any other ecological constraints.

3.2 Literature review and database search

A review of readily available databases and literature pertaining to the ecology and environmental features of the site and surrounding locality was conducted to identify key ecological matters relevant to the area and the regional context. Database records and relevant literature included:

- NSW Office of Environment and Heritage (OEH) Atlas of NSW Wildlife (10 km search radius) (accessed 3 July 2019);
- Department of the Environment and Energy (DoEE) online search for Matters of National Significance (10 km buffer search) (3 July 2019);
- Aerial mapping.

Species from both the Atlas of NSW Wildlife (NSW BioNet) and DoEE online search were combined to produce a list of threatened species, populations and communities that may occur within the site. The likely occurrence for threatened species, populations and communities was then determined based on database location records, the likely presence or absence of suitable habitat on the site based on the results of the field survey.

3.3 Field survey

The area of the proposed works was inspected by ELA Ecologists Liz Brown and Ronnie Hill on the 3rd and 4th June 2019. Site conditions were windy and overcast with maximum temperatures ranging from 21.1°C to 22.7°C. The aim of the field survey was to:

- assess and identify the vegetation communities of the study area;
- assess key sensitive areas, threatened species and community locations identified during the literature review and database search;
- identify significant weeds and disturbed areas; and
- identify key flora and fauna habitat, such as hollow bearing trees.
- Undertake vegetation plots in accordance with the BAM (Figure 3)

The site was traversed on foot. A total of three vegetation plots in accordance with the BAM were completed. A handheld GPS unit was used for recording the location of key features in the field and results of the survey. The data from handheld GPS units can vary in accuracy by more than 10 m.

Given the current condition of vegetation within the study area, no targeted fauna surveys were undertaken.

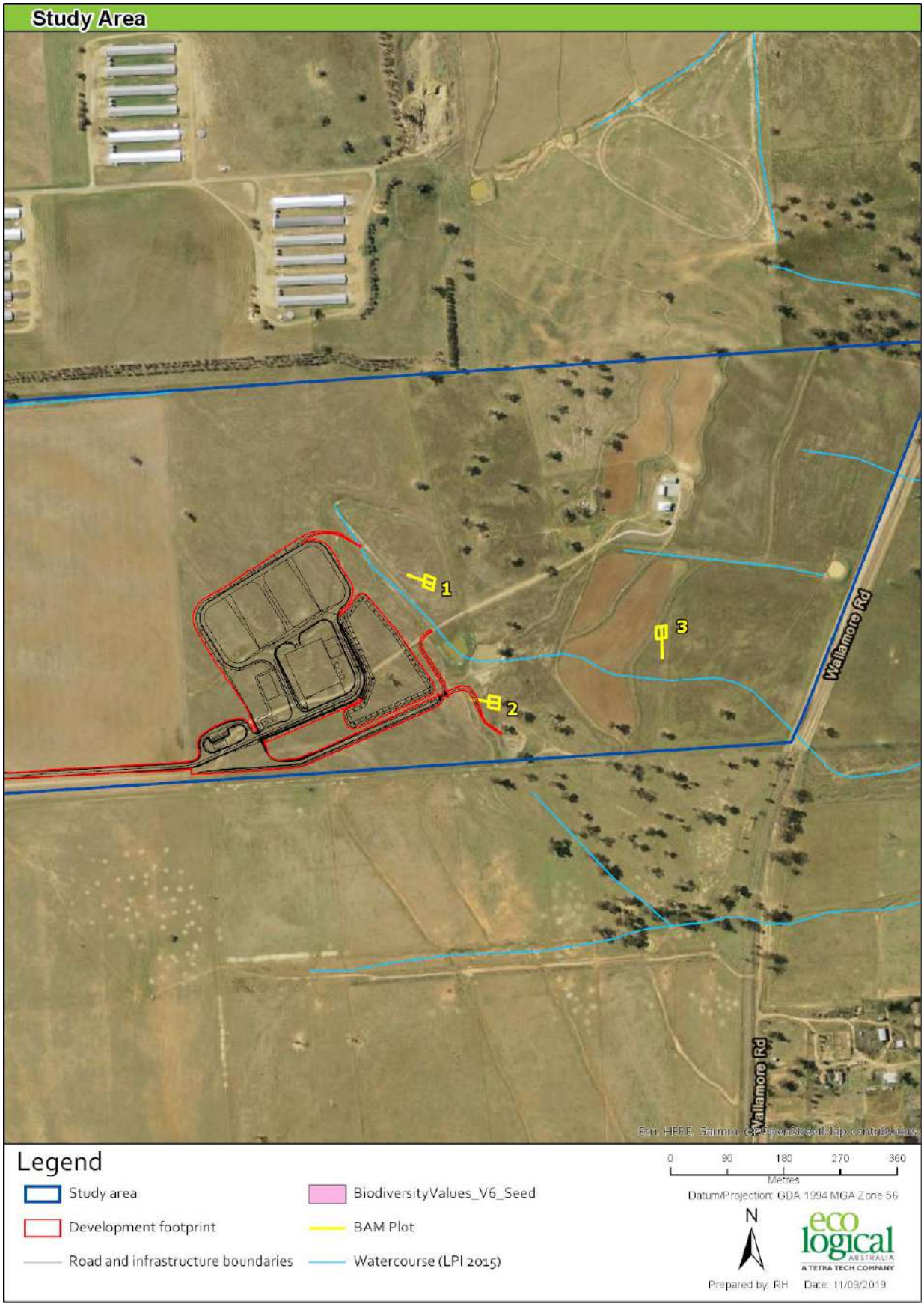

Figure 3: Vegetation plot locations.

4. Results

4.1 Existing Environment

A search of the Atlas of NSW Wildlife (NSW BioNet) was updated on the 3 July 2019 and identified records of two threatened fauna species and no threatened flora listed under the BC Act recorded within a 10 km radius of the subject site. Both these species are also listed under the EPBC Act (Figure 4).

A likelihood of occurrence table for species listed under the BC Act, EPBC Act or FM Act is provided in Appendix B. Fauna listed under the EPBC Act as marine have not been included in the likelihood table as these are only relevant if impacting on a Commonwealth marine area. Generally, the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

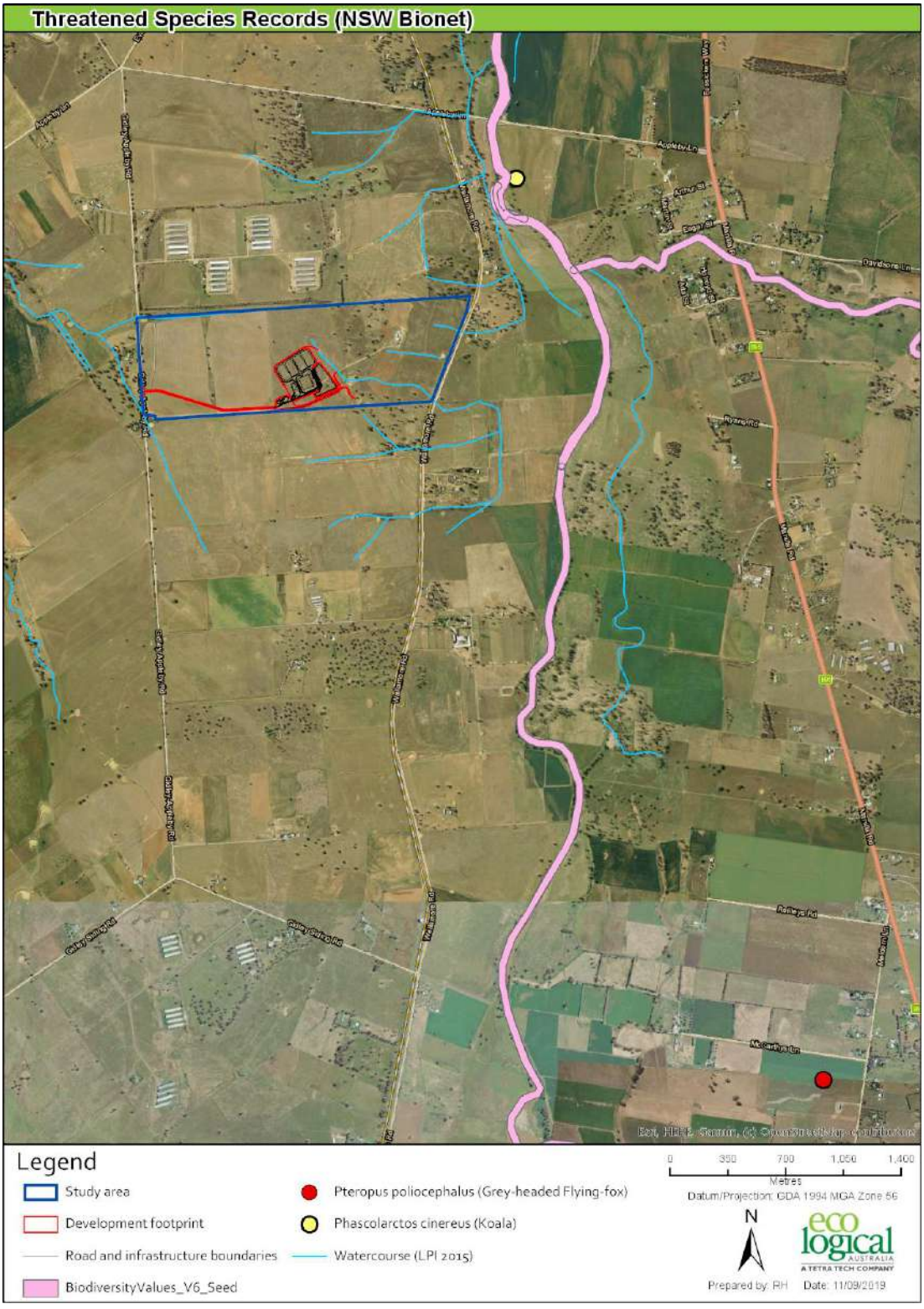

Figure 4: Threatened species records recorded within 10 km² of Study area.

4.1.1 Vegetation Communities

One vegetation community was identified within the vicinity of the proposed works 'Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion (PCT 516)'. All other areas within the study area are 'cleared'.

PCT516 Grey Box grassy woodland

PCT 516 (Grey Box grassy woodland) found onsite is an open woodland/grassland community, occupying approximately 7.91 ha of the study area. The canopy layer consists of one species (*Eucalyptus mollucana* or Grey Box) with 16 trees being identified as HBTs. The mid-story is absent throughout the site. The understory was heavily grazed at the time of survey, with the groundcover comprising primarily of *Aristida personata* (Purple-wire grass), *Echium plantegium* (Patterson's curse), *Austrostipa scrabra* (Speargrass) and *Cynodon dactylon* (Couch, Figure 5). Although 7.91 ha of PCT 516 occurs within the study area, the community is outside the impact area associated with the subject site, as such 0 ha of this community will be removed (Table 1 , Figure 7).

PCT516 is currently not listed as a threatened ecological community under either the BC or EPBC Acts.

Figure 5 Remnant PCT 516 found within the south eastern section of the study area (pictured: vegetation plot 2).

Cleared land

The cleared vegetation community is found throughout the paddocks, in a highly degraded condition. This community occupies approximately 107.91 ha of the study area. The canopy consists of one tree species (Grey Box). These exist as sparse paddock trees throughout the area, with 8 being identified as HBTs. The mid-story is absent throughout the site, whilst the understory is comprised mostly of bare

ground, with few natives and exotics. Dominant species include Purple-wire grass, Patterson's curse, Speargrass, *Medicago minima* (Woolly-burr medic) and Couch (Figure 6). Approximately 11 ha of this community is proposed to be directly impacted within the subject site (Table 1, Figure 7).

Table 1: Total vegetation community type area and area to be directly impacted by proposal

Vegetation Community	Study Area	Subject site
Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion (PCT 516)	7.91 ha	0 ha
Cleared Area	107.91 ha	11 ha
Total	**115.82 ha**	**11 ha**

Figure 6: The 'cleared' vegetation community typically found through the study area.

Figure 7: Vegetation communities mapped within the study area.

4.1.2 Flora

No threatened flora species were observed during the field survey. Threatened flora considered to potentially occur in the locality have been assessed in the likelihood table presented in Appendix B.

No priority weeds listed under the North West Regional Strategic Weed Management Plan 2017-2022 were identified within the study area.

A list of flora recorded in the BAM vegetation plots are presented in Appendix A.

4.1.3 Fauna

Appendix B provides a likelihood of occurrence assessment of threatened species considered to have potential to occur. Appendix C and Appendix D provides an outline of the factors considered when determining whether an Assessment of Significance or a Significant Impact Criteria assessment was required for these selected species.

Few native fauna were observed onsite during the June field survey (Table 2). Windy conditions at the time of survey were thought to have discouraged birds from flying throughout the study area.

Table 2 Fauna observed during the June field survey

Scientific Name	Common Name
Gymnorhina tibicen	Australian Magpie
Eolophus roseicapilla	Galah

4.2 Impact Assessment

Assessment of the potential direct and indirect impacts to surrounding vegetation and flora and fauna habitat resulting from the proposal are provided in this section.

Direct impacts include:

- Ground disturbance, including the removal or modification of up to 11 ha of the 'cleared' vegetation community.
- Removal of 1 HBT that is located within the subject site.

Indirect impacts include:

- Potential sedimentation of adjacent areas
- Potential pollution; including effluent runoff and contamination issues
- Disturbance to fauna resulting from noise and movements of people and vehicles during construction works
- Potential introduction of exotic weeds.

No significant impacts to threatened species, populations, or ecological communities listed under the BC Act or EPBC Act are considered likely to occur as a result of the proposal. The proposed mitigation measures will minimise any indirect impacts on the environment in the vicinity of the proposed works area. All mitigation measures have been provided in Section 5.

5. Recommendations and Conclusion

The Subject site contains little habitat for native fauna with just one HBT occurring within the impact boundary. No other habitat features including large woody debris, rocks or drainage lines were identified within the Subject site. Previous land use has left the land in a degraded state with the area included in the Subject site being 'cleared' and deemed unlikely to host any threatened species. Section 4 of this report concluded that the proposed works are unlikely to significantly impact upon threatened species, population or communities.

The following safeguards are recommended to further minimise potential impacts to the environment; including weed management, pollution and accelerated erosion resulting from the earthworks related to the development of the site.

Impact	Mitigation Measures
Vegetation removal	Clearly label extent of works in the CEMP (including maps and figures) to reflect the area assessed in this FFA. Mark out no-go areas (extents of batters) on the ground. Sign and fence areas of PCT 516 to avoid accidental disturbance. Ensure work construction staff understand the importance of environmental values on site. Removal of the habitat tree found within the subject site should follow the clearing protocol attached in Appendix E.
Pollution	Site Environmental Management Plan to address pollution and contamination issues, such as silt control, effluent run-off and oil/fuel/chemical storage/spill management, which could arise during construction and operation of the site.
Sediment	Erosion and sediment control measures will be established before work begins and maintained in effective working order throughout the duration of the works, and until the site has been stabilised to prevent off-site transport of eroded sediments.
Weed and pathogen spread	Ensure all plant and machinery are washed down before use on site. Any priority weeds as identified within the North West Regional Strategic Weed Management Plan (2017 – 2022) will be removed.

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Appendix A Vegetation Plots

5.1 Results

Table A 1: Cover and abundance of species recorded within the BAM vegetation plots

Scientific Name	Common Name	Plot 1		Plot 2		Plot 3	
		Cover %	Abundance	Cover %	Abundance	Cover %	Abundance
Aceana ovina		0.5	15	0.1	20		
Aristida personata	Purple Wire-grass	4	5	4	25	5	60
Austrostipa scabra	Speargrass	8	30	6	30		
Avena sativa	Oats					0.1	1
Bothriochloa macra	Red Grass	0.4	8			0.4	10
Calotis lappulacea	Yellow Burr-daisy	0.2	2				
*Capsella bursa-pastoris**	Shepherd's Purse			0.3	10	0.2	5
*Carthamus lanatus**	Saffron Thistle	0.3	3				
Chloris truncata	Windmill Grass	2	2			0.1	2
*Chondrilla juncea**	Skeleton Weed					0.2	25
*Conyza sp.**				0.5	10		
Cynodon dactylon	Couch			3	25		
Digitaria divaricatissima	Umbrella Grass	0.1	2				
Dysphania pumilio	Small Crumbweed			0.2	3		
*Echium plantagineum**	Paterson's Curse	12	300	4	50	6	100
Einadia polygonoides		4	60	1	30		
*Eragrostis cilianensis**	Stinkgrass	0.1	1	0.4	3		
Eragrostis sp.		0.1	3			0.2	5

Scientific Name	Common Name	Plot 1		Plot 2		Plot 3	
		Cover %	Abundance	Cover %	Abundance	Cover %	Abundance
Erodium crinitum	Blue Storksbill			0.2	2		
Eucalyptus molucanna	Grey Box			10	2		
Euphorbia drummondii	Caustic Weed	0.1	8				
*Lepidium africanum**		1	10	0.2	3		
*Malva parviflora**	Small-flowered Mallow			1	20		
*Medicago minima**	Woolly Burr Medic	6	500	0.8	60	0.3	200
Paspalum sp.						0.1	1
Poaceae sp.		0.3	50			0.2	20
*Polygonum aviculare**	Wireweed					0.1	2
Portulaca oleracea	Pigweed			0.1	2		
Rhytidosperma sp.	Wallaby Grass	0.3	5				
Rumex sp.	Swampdock	0.1	1	0.2	4	0.1	2
Salsola australis		0.3	8	0.5	5	0.2	5
*Schkuhria pinnata var. abrotanoides**		0.1	1				
Sida corrugata	Corrugated Sida			0.5	2		
*Sida spinosa**		2	80	1	80	2	80
*Silybum marianum**	Variegated Thistle					0.3	10
*Sisymbrium irio**	London Rocket			0.3	20		
*Sonchus oleraceaus**	Common Sowthistle	0.1	1			0.2	5
Sporobolus crebra	Slender Rat's Tail Grass	0.2	2				

Scientific Name	Common Name	Plot 1		Plot 2		Plot 3	
		Cover %	Abundance	Cover %	Abundance	Cover %	Abundance
*Taraxicum officinale**	Dandelion					0.3	5
Trifoilium sp.				0.4	50	0.2	8
*Urochloa panicoides**	Urochloa Grass	0.2	15			0.2	8
Vittadinia sp.		0.2	5				
Whalenbergia luteolens						0.1	2

* Denotes an exotic species

A1 Photos

Figure A-1: Vegetation plot 1 (top: plot start; Bottom: plot end).

Figure A-2: Vegetation plot 2 (top: plot start; Bottom: plot end).

Figure A-3: Vegetation plot 3 (top: plot start; Bottom: plot end).

Appendix B Likelihood of Occurrence Table

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposed development site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "known" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Species, populations and communities considered to have the potential, are likely or are known to occur are highlighted blue.

Key to the table:

- BC Act = Listing under the NSW *Biodiversity Conservation Act 2016*
- EPBC Act = Listing under the *Environment Protection and Biodiversity Conservation Act 1999*
- FM Act = Listing under the *Fisheries Management Act 1994*
- CE = Critically Endangered
- E = Endangered (EPBC Act)
- E1 = Endangered (BC Act)
- E2 = Endangered Population (BC Act)
- E4 = Extinct (BC Act)
- V = Vulnerable
- M = Migratory (EPBC Act

Table B 1: Threatened ecological communities likelihood table

Community Name	Conservation Status		BC Act listing equivalent	Habitat present (good, marginal, none)	Community known to occur in region (yes/no)	Community known to occur on site (yes/no)	Likelihood of occurrence	Impact Assessment Required
	BC Act	EPBC Act						
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	E	CE	Native vegetation on cracking clay soils of the Liverpool Plains	Nil	Yes	No	None	No – Community absent from site
New England Peppermint (*Eucalyptus nova-anglica*) Grassy Woodlands	CE	CE	New England Peppermint (Eucalyptus nova-anglica) Woodland on Basalts and Sediments in the New England Tableland Bioregion	Nil	Yes	No	None	No – Community absent from site
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	E	CE	White Box Yellow Box Blakely's Red Gum Woodland	Nil	Yes	No	None	No – Community absent from site

Table B 2: Threatened flora species likelihood table

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
Cadellia pentastylis	Ooline	V	V	Dry rainforest, semi-evergreen vine thickets and sclerophyll communities. Usually on low- to medium-nutrient soils of sandy clay or clayey consistencies.	Marginal	Unlikely	No – Species not located during field survey
Callistemon pungens			V	Rocky watercourses, usually with sandy granite (occasionally basalt) creek beds.	None	No	No – site does not contain potential habitat for this species
Dichanthium setosum	Bluegrass	V	V	Cleared woodland, grassy roadside remnants and highly disturbed pasture, on heavy basaltic black soils and red-brown loams with clay subsoil.	Marginal	Unlikely	No – habitat is unsuitable for this species
Euphrasia arguta		CE	CE	Eucalypt forest with a mixed grass and shrub understorey, disturbed areas, along roadsides.	Marginal	Unlikely	No – habitat is unsuitable for this species
Thesium austral	Austral Toadflax	V	V	Grassland on coastal headlands or grassland and grassy woodland away from the coast.	Marginal	Unlikely	No – habitat is unsuitable for this species

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
Tylophora linearis				Dry scrub, open forest, dry woodlands of Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla and Allocasuarina luehmannii.	None	Unlikely	No – site does not contain potential habitat for this species

* CE – Critically Endangered, E – Endangered, V – Vulnerable

Table B 3: Threatened fauna species likelihood table

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
Amphibia							
Litoria booroolongensis	Booroolong Frog	E1	E	Permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	Marginal	Unlikely	No – habitat is unsuitable for this species
Birds							
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of Casuarina cunninghamiana (River Oak).	Marginal	Unlikely	No - habitat for this species will not be affected
Botaurus poiciloptilus	Australasian Bittern	E1	E	Permanent freshwater wetlands with tall, dense vegetation, particularly Typha spp. (bullrushes) and Eleocharis spp. (spikerushes).	None	No	No – site does not contain potential habitat for this species

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
Calidris ferruginea	Curlew Sandpiper	E1	CE	Generally, occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal; mudflats of sheltered coasts,	None	No	No – site does not contain potential habitat for this species
Erythrotriorchis radiatus	Red Goshawk	E4A	V	Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and coastal riparian Eucalyptus forest.	Marginal	No	No – site outside of geographic range for this species
Grantiella picta	Painted Honeyeater	V	V	Boree, Brigalow and Box-gum Woodlands and Box-Ironbark Forests.	Marginal	Potential	No - habitat for this species will not be affected
Lathamus discolor	Swift Parrot	E1	CE	Box-ironbark forests and woodlands.	Marginal	Unlikely	No - habitat for this species will not be affected
Rostratula australis	Australian Painted Snipe	E1	E	Swamps, dams and nearby marshy areas.	Marginal	Unlikely	No – habitat is unsuitable for this species
				Fish			
Maccullochella peelii	Murray Cod		V	Clear rocky streams to slow flowing, turbid rivers and billabongs. Frequently found in the main river channel and larger tributaries; also in floodplain channels when they contain water.	None	No	No – site does not contain potential habitat for this species
				Mammals			
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Marginal	Potential	No- habitat for this species will not be affected

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed Quoll	V	E	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	None	No	No – site does not contain potential habitat for this species
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Mallee, *Allocasuarina luehmannii* (bulloke) and box eucalypt- dominated communities, especially box/ironbark/cypress-pine vegetation.	Marginal	Potential	No- habitat for this species will not be affected
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	None	No	No – site does not contain potential habitat for this species
Phascolarctos cinereus	Koala	V	V	Eucalypt woodlands and forests.	Marginal	Potential	Yes –occurrence record NE of site and secondary feed tree occurrence within study area
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Marginal	Unlikely	No – potential foraging habitat will not be affected
				Reptilia			
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	Sloping, open woodland areas with predominantly native grassy ground layers, rocky outcrops or scattered, partially buried rocks.	Marginal	No	No – site outside of range for this species
Uvidicolus sphyrus	Border Thick-tailed Gecko	V	V	Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter.	Marginal	No	No – habitat is unsuitable for this species

Scientific Name	Common Name	Conservation Status*		Habitat	Habitat quality present (good, marginal, none)	Likelihood of occurrence	Impact Assessment Required
		BC Act	EPBC Act				
				Occupied sites often have a dense tree canopy that helps create a sparse understorey.			

* CE – Critically Endangered, E – Endangered, V – Vulnerable, M – Migratory

Appendix C BC Act Assessments of Significance

Under Part 7, Division 1 of the NSW BC Act, the test of significance is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. This test has been applied to ecological communities and species listed under the BC Act that are considered to be potentially impacted by the proposal. Fauna species have been categorised into functional groups to streamline the assessment.

Species that have been assessed against the test of significance were identified through the development of the Likelihood of Occurrence (**Appendix B**). The following species are assessed below:

- *Phascolarctos cinereus* (Koala) – Vulnerable

Phascolarctos cinereus (Koala)

The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations located west of the Great Dividing Range (OEH 2019b).

Koalas feed on the leaves of more than 70 eucalypt species and 30 non-eucalypt species; however, specific species are preferred depending on availability. *Eucalyptus moluccana,* a secondary feed tree species, is present across the study area

No koala has been recorded within the proposed works area. The closest known record was recorded in 2006 approximately 1.5 km north east of the disturbance boundary (OEH 2019a).

a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The proposal is unlikely to affect the lifecycle of the koala as the disturbance area includes a very small area of potential foraging habitat for the Koala. The subject site consists of sparse paddock trees, with two areas being mapped as suitable woodland on site. All habitat trees will also be retained for the proposed works.

b. In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable. There are no endangered populations in proximity to the subject site.

c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development, and

The proposed works will impact up to impact up to 11 ha of ground disturbance within the proposal area and the removal of 1 HBT

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The fragmentation impacts associated with the proposal are predicted to be minor. The property fences, and large open areas within the landscape already provide existing barriers to koalas moving through the study area.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The proposal area provides habitat characteristics for the Koala in the form of secondary koala feed trees. However, given that all of these trees but one will be retained and that only the understory vegetation will be modified, the proposed works are not likely to affect the long-term survival of the species at the locality.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

No area of outstanding biodiversity value (critical habitat) has been declared for the Koala.

e. whether the proposed development or activity or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A key threatening process is defined under the BC Act as "*a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities*". One key threatening process of relevance to the Koala and this proposal is:

- Clearing of native vegetation

The impacts of this clearing in regard to foraging and breeding habitat of the Koala have been considered, and the scale of these impacts within the disturbance area is not considered to be significant.

Conclusion

The proposal is unlikely to have a significant impact on the Koala given that:

- The proposed works would constitute a minor disturbance given that all habitat trees will be retained but one, and only the understory vegetation will be affected
- The proposed works would remove habitat that is highly disturbed from previous land use
- Given the physical barriers already present on site, it is highly unlikely that koalas use the area for foraging
- Larger areas of suitable foraging habitat are present within the surrounding landscape
- The proposal would not further isolate or fragment any currently connecting areas of habitat in terms of use by this mobile species

On the basis of the above considerations, it is unlikely that the proposal would result in a significant impact on the Koala. Consequently, a Species Impact Statement is not required for the proposal with respect to these species.

Appendix D EPBC Act Significant Impact Assessments

The EPBC Act Administrative Guidelines on Significance set out 'Significant Impact Criteria' that are to be used to assist in determining whether a proposed action is likely to have a significant impact on matters of national environmental significance (MNES). Matters listed under the EPBC Act as being of national environmental significance include:

- Listed threatened species and ecological communities
- Listed migratory species
- Wetlands of International Importance
- The Commonwealth marine environment
- World Heritage properties
- National Heritage places
- Nuclear actions

Specific 'Significant Impact Criteria' are provided for each matter of national environmental significance except for threatened species and ecological communities in which case separate criteria are provided for species listed as endangered and vulnerable under the EPBC Act.

The relevant Significant Impact Criteria have been applied to the following communities and species:

- *Phascolarctos cinereus* (Koala) – vulnerable

Phascolarctos cinereus (Koala)

The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations located west of the Great Dividing Range (OEH 2019b).

Koalas feed on the leaves of more than 70 eucalypt species and 30 non-eucalypt species; however, specific species are preferred depending on availability. Eucalyptus moluccana, a secondary feed tree species, is present across the study area

No koala has been recorded within the proposed works area. The closest known record was recorded in 2006 approximately 1.5 km north east of the disturbance boundary (OEH 2019a).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

Criterion 1: lead to a long-term decrease in the size of an important population of a species

The study area is not likely to support an important population of the Koala.

Criterion 2: reduce the area of occupancy of an important population

The study area is not likely to support an important population of the Koala.

Criterion 3: fragment an existing important population into two or more populations

The study area is not likely to support an important population of the Koala.

Criterion 4: adversely affect habitat critical to the survival of a species

Under the Koala Habitat Assessment Tool (DoE 2014), a score of five or more is considered to indicate that core Koala habitat is present. The assessment score for the current proposal (shown in Table D1) produced a result of four, therefore the vegetation within the study area does not meet the criteria for "Habitat likely to be critical to the survival of the Koala". Consequently, referral to the DotEE is not recommended.

Criterion 5: disrupt the breeding cycle of an important population

The study area is not likely to support an important population of the Koala.

Criterion 6: modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposed development is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Koala is likely to decline. Only one HBT will be removed as a result of the proposed works and the understory vegetation that will be removed was already in a highly disturbed state.

Criterion 7: result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The proposed development is unlikely to result in invasive species that are harmful to the Koala becoming established in its habitat. A suite of invasive species potentially harmful to the species are already established in the study area. It is unlikely that additional invasive species would become established as the result of the proposal; the potential for new weed species to establish will be managed via the impact mitigation measures outlined in this report.

Criterion 8: introduce disease that may cause the species to decline

The proposed development is unlikely to introduce disease that may cause the decline of the Koala or interfere substantially with the recovery of the species.

Criterion 9: interfere substantially with the recovery of the species.

A national recovery plan has not been prepared for the Koala.

Koala EPBC Act referral assessment

The Koala habitat assessment tool (DoE 2014) was applied to the study area and wider locality to assess if the area constitutes habitat critical to the survival of the Koala. The study area scored a habitat score of four and results of this assessment are presented in Table D1.

Table D 1: Koala habitat assessment tool

Attribute	Score	Assessment criteria (Inland)	Assessment details	
Koala occurrence	+1 (low)	koala records within 2 km of the edge of the impact area within the last 10 years.	Desktop	EPBC PMST report identified Koala as 'Species or species habitat known to occur within area' NSW Bionet search identified a record of Koala approximately 1.5 km north east of the proposed area.
			On-ground	No evidence of Koala, including actual individuals, scats or scratches were identified during the field survey.
Vegetation composition	+1 (high)	Has forest, woodland or shrubland with emerging trees with only 1 species of known koala food tree present.	On-ground	*Eucalyptus moluccana* is listed by OEH as a secondary koala feed tree.
Habitat connectivity	+0 (high)	Area is not part of a contiguous landscape	On-ground and mapping	A contiguous landscape is defined to encompass 'no barriers' with a barrier being defined as 'a feature (natural or artificial) that is likely to prevent the movement of Koalas. Natural barriers may include steep mountain ranges (cliffs), unsuitable habitats, major rivers / water bodies or treeless areas more than 2 km wide. Artificial barriers may include infrastructure (such as roads, rail, mines, large fences etc.) without effective Koala passage measures, or developments that create treeless areas more than 2 km wide.' The study area is surrounded by artificial barriers (fencing and roads).

Attribute	Score	Assessment criteria (Inland)	Assessment details	
Key existing threats	+2 (medium)	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.	On-ground and mapping	It is likely that Koalas have a minimal risk of dog attack and vehicle strikes in areas surrounding the study area on an infrequent basis.
Recovery value	+0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context.	On-ground & Reporting	The interim recovery objectives are provided below: 6. Protect and conserve the quality and extent of habitat refuges for the persistence of the species during droughts and periods of extreme heat, especially in riparian environments and other areas with reliable soil moisture and fertility 7. Maintain the quality, extent and connectivity of large areas of habitat surrounding habitat refuges
Total	4	Decision: Habitat not likely to be critical to the survival of the Koala		

Appendix E Clearing protocol

The protocol used to fell HBTs is recommended to be as follows:

1. The nearest veterinary clinic, wildlife carer and/or an appropriately trained ecologist phone numbers should be on hand if any fauna is injured during clearing of trees.
2. All trees are to be visually inspected by a qualified ecologist or suitably trained person for fauna immediately prior to tree removal.
3. Care should be taken to allow all fauna to vacate a given tree prior to felling.
4. Habitat trees and or habitat features (Large Woody Debris) should be utilised within appropriate offsetting or natural areas for fauna habitat purposes.
5. Pre-felling procedures for all trees to be felled include shaking or nudging tree trunks with the dozer blade to evacuate mobile fauna, such as birds. The following are possible scenarios and the appropriate procedure to manage these scenarios:
6. If microchiropteran bats or other nocturnal hollow dwelling fauna are still observed within the tree following pre-felling procedures (i.e. tree shaking), the tree is to be retained in the short term and the following procedure should be applied:
    a. Appropriate licenses to “harm” fauna under the National Parks and Wildlife Act 1974 are to be sourced prior to the felling works;
    b. An appropriately trained and licensed ecologist with Lyssa Virus vaccination should be contacted and be present during the felling process (Note: Australian Microchiropteran bats can carry Lyssa Virus, a debilitating disease similar to rabies);
    c. The nearest veterinary clinic and wildlife carer phone number should be on hand;
    d. Each hollow-bearing section of the tree is to be lopped and carefully lowered to the ground;
    e. All data on species and number of hollow bearing fauna is to be recorded;
    f. Once on the ground each hollow is to be inspected for resident fauna. And any injured fauna are to be cared for;
    g. The hollow-bearing limb should then be removed from the tree and positioned in a nearby safe and appropriate location at the same aspect and height of its original location.
7. All hollow-bearing trees are to undergo a controlled lowering.
8. For non-hollow-bearing trees, if no fauna are observed to be within a tree to be felled, the “slow drop” technique is to be used to fell the tree. This involves nudging and shaking the tree, followed by a slow drop.

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Aboriginal Heritage Due Diligence Assessment

Appendix I

pitt&sherry

Tamworth Organics Recycling Facility – Alternative Site Assessment to Support the EIS

Archaeological Due Diligence Assessment

Prepared for Pitt & Sherry

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Template 2.8.1

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1. Introduction

This assessment outlines the findings of the archaeological due diligence assessment of the study area, in accordance with the NSW Department of Environment, Climate Change and Water NSW (NSW DECCW) *Due Diligence Code of Practice for the protection of Aboriginal Objects in New South Wales* (NSW DECCW, 2010).

1.1 Assessment process

The aims of this archaeological due diligence assessment are to:

- Undertake a search of the Aboriginal Heritage Information Management System (AHIMS) register maintained by the OEH to establish if there are any previously recorded Aboriginal objects or places within the study area.
- Undertake a search of the NSW State Heritage Inventory, the Australian Heritage Database, and the Tamworth Regional Council Local Government Area (LGA) Local Environmental Plan (LEP, 2010) Schedule 5 (Environmental Heritage) in order to determine if there are any sites of archaeological significance or sensitivity located within the study area.
- Undertake a desktop review of relevant previous archaeological assessments to understand the local archaeological context and assist in predicting the likely occurrence of unrecorded archaeological sites or objects.
- Undertake a site inspection to identify any Aboriginal sites and areas of sensitive landforms.
- Prepare an archaeological due diligence assessment determining if known objects or additional unrecorded objects are present within the study area, as well indicate whether further assessment and/or an AHIP is required.

The OEH process involves *"taking reasonable and practical measures to determine whether your actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm"* (NSW DECCW, 2010:6).

If an AHIP application is required, the OEH necessitate that it is supported by an Aboriginal Cultural Heritage Assessment (ACHA) prepared in line with the '*Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW'* (OEH 2010), and a copy an approval for the development or infrastructure under Part 4 or Part 5 of the *Environmental Planning and Assessment Act 1979* (NSW).

An archaeologically sensitive landscape is an area that has the potential for archaeological material to be present within. According to the Due Diligence Code of Practice, archaeologically sensitive landscapes can include areas:

- Within 200m of waters;
- Located within a sand dune system;
- Located on a ridge top, ridge line, headland;
- Located within 200m below or above a cliff face;
- Within 20m of or in a cave, rock shelter, or a cave mouth;
- And is on land that is not disturbed land

According to the *Due Diligence Code of Practice,* disturbed land is defined as any area that has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable (NSW DECCW, 2010:7.5).

"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.

*Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks."(*DECCW 2010).

1.2 Due diligence assessment summary

ELA has undertaken a desktop and site survey archaeological due diligence assessment for the proposed Organics Recycling Facility area, in order to determine if there are any registered Aboriginal sites, artefacts or archaeologically sensitive landscape features that require further assessment (**Figure 1**). This assessment involved a review of the AHIMS database as well as State Heritage registers, followed by a site visit and inspection. Following these assessments, it was found that three aboriginal objects are present within the study area, though the proposed subject site will not impact these features. The study area was assessed to have a low archaeological potential in areas of proposed impact, thus further works are not required.

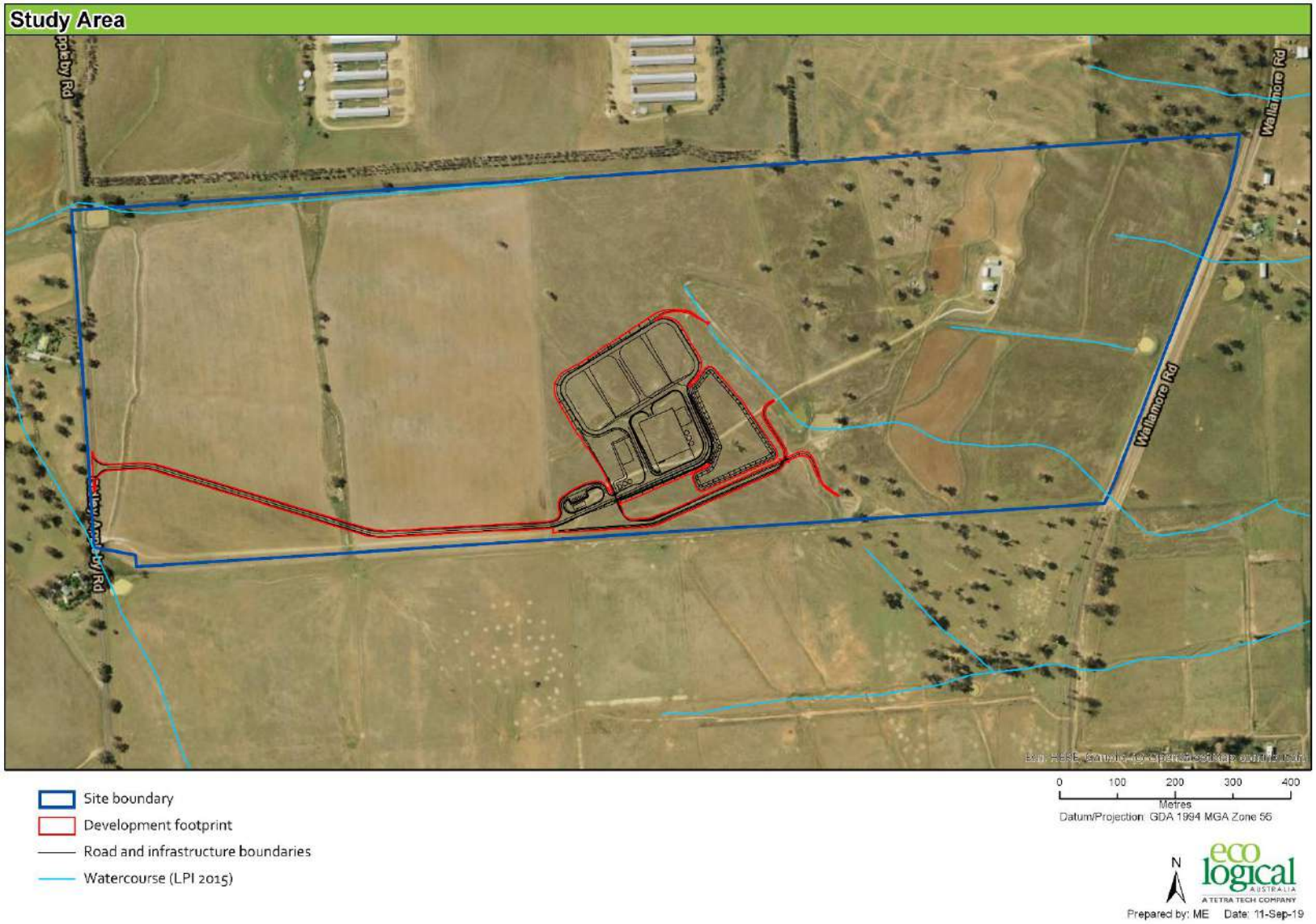

Figure 1: The Study Area

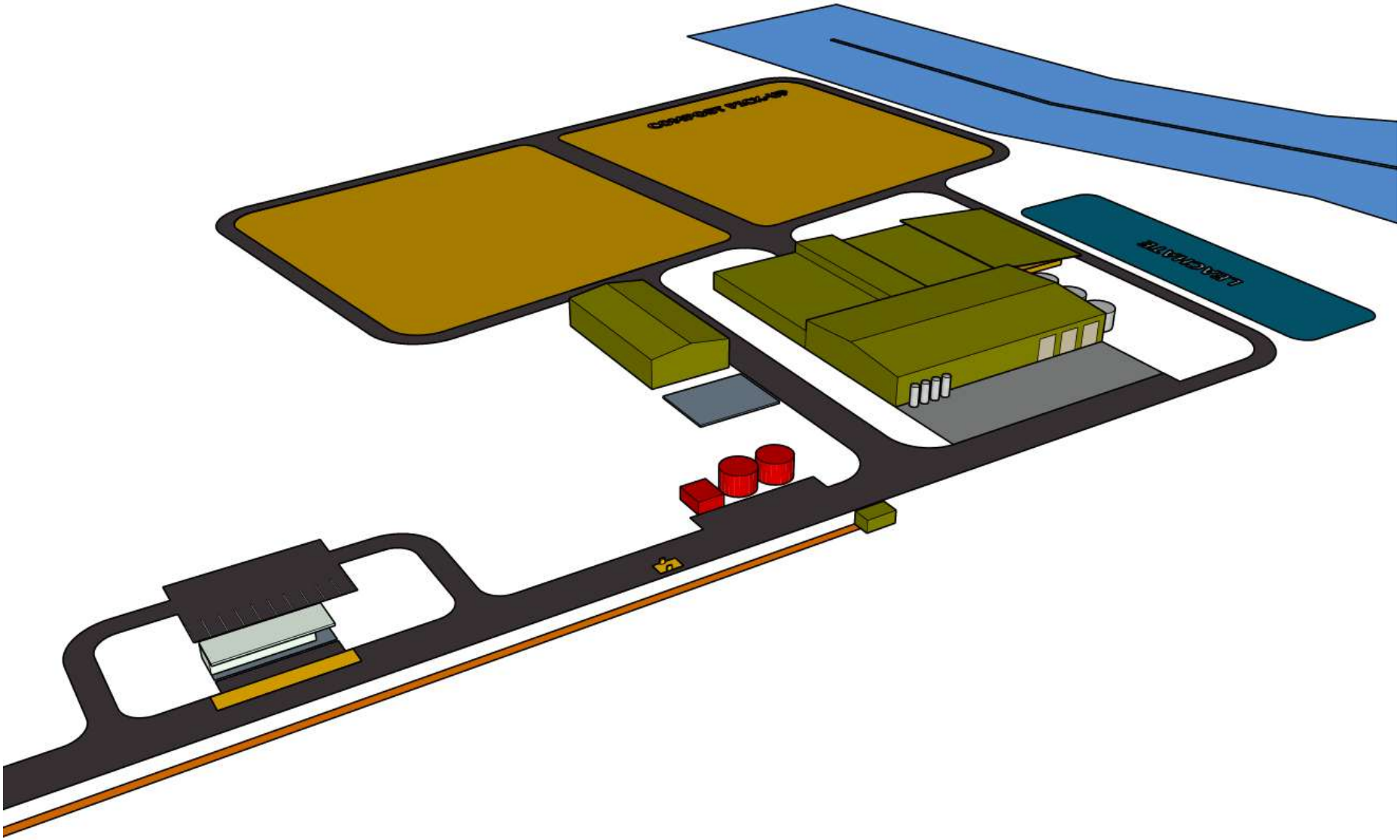

Figure 2: Concept development drawing, provided by Pitt & Sherry

2. Assessment Process

2.1 Identify if the proposed activity will disturb the ground surface

The existing landscape at the site will be disturbed by the proposed works, consisting of already exposed surface disturbance, excavations, and infrastructure development. The identified disturbances will be constrained to the proposed works subject site (approximately 11 ha) and will involve extensive shallow excavation works for new access roads and shed constructions, as well as deep excavation works for a 16 ML leachate dam (**Figure 2**).

2.2 Database searches and known information sources

2.2.1 AHIMS search

The Aboriginal Heritage Information Management System (AHIMS) is a database maintained by OEH and regulated under Section 90Q of the *National Parks and Wildlife Act 1974.* AHIMS holds information and records regarding the registered Aboriginal archaeological sites (Aboriginal objects, as defined under the Act) and declared Aboriginal places that exist in NSW.

A search of the AHIMS database was conducted on 11 June 2019 to identify if any registered Aboriginal sites were present within, or adjacent to, the study area (**Table 1**) (**Appendix A**).

The AHIMS database search was conducted within the following lot/coordinates:

- GDA: Zone 56
- Easting: -31.0412, -30.922
- Northing: 150.749, 150.9379
- Buffer: 1000 m

The AHIMS search result showed:

Table 1: AHIMS search result

89	Aboriginal sites are recorded in or near the above location
0	Aboriginal places have been declared in or near the above location

No Aboriginal sites have previously been recorded within the study area.

The distribution of recorded Aboriginal sites near to the study area is shown in **Figure 3**. The frequencies of site types and contexts recorded within the AHIMS database search area are listed in **Table 2**:

Table 2: Frequencies of site types and contexts

Site Context	Site Features	Number	%
Grinding Groove	Axe Grinding Groove	3	3.37
Carved Tree	Modified Tree	2	2.24
Open Camp Site	Artefact	4	4.49
Stone Quarry	Artefact	3	3.37
Stone Quarry	Artefact, Open Camp Site, Quarry	2	2.24
Isolated Find	Artefact	1	1.12
Unknown	Artefact	74	83.14
	Total	89	99.17

No registered Aboriginal sites are located within the study area.

2.2.2 Local, state and national heritage registers

Searches of the Australian Heritage Database, the State Heritage Register (SHR) and the Tamworth Regional Council Local Government Area (LGA) Local Environmental Plan (LEP, 2010) utilising the terms "Appleby, Attunga, Gidley, Hallsville, Moore Creek and Tamworth Regional LGA" were conducted on 26-Jun-19 in order to determine if any places of archaeological significance are located within the study area (**Tables 3 to 5**).

No Aboriginal archaeological sites or heritage items were recorded on these databases within the proposed area

Places of local heritage listing are located within a 5 km buffer of the proposed works which are listed in **Table 3** and shown in **Figure 4**. No state heritage listed places are located within this search area. The closest historical site is "Matilda Park" which is located ~570 m to the north-west and accessed by Gidley-Appleby Road, if the proposed works are constrained to the development boundary it is expected that any indirect effects will not be significant. All other places of historic heritage will not be affected by the proposed works.

Table 3: Historic sites identified by the NSW State Heritage Register.

NSW State Heritage Register		
Item No.	Item Name	Address
Nil	Nil	Nil

Table 4: Historic sites and distance from the study area identified by the Tamworth LGA Local Heritage Register.

Local Heritage within the Tamworth LGA				
Item No.	Item Name	Class	Significance	Distance
I002	Silverweir	General	Local	0.89 km
I001	Matilda Park	General	Local	0.57 km
I250	Australian Arms	General	Local	1.65 km
I128	Former Hallsville Hall	General	Local	0.98 km
I012	Wyaralong Homestead	General	Local	3.15 km
I251	Old Tobacco Shed at Hillstone	General	Local	4.55 km
I132	Old Post Office, Glenlui	General	Local	2.15 km
I124	Gidley Soils	General	Local	3.13 km
I133	School Residence	General	Local	4.14 km

Table 5: Historic sites identified by the Australian Heritage Database

Australian Heritage Database Results				
Place ID	Item Name	Listing	Address	Distance
395	Australia Arms Hotel Group	Register of the National Estate	Holroyd Street, corner Arthur Street, Moore.	1.65 km

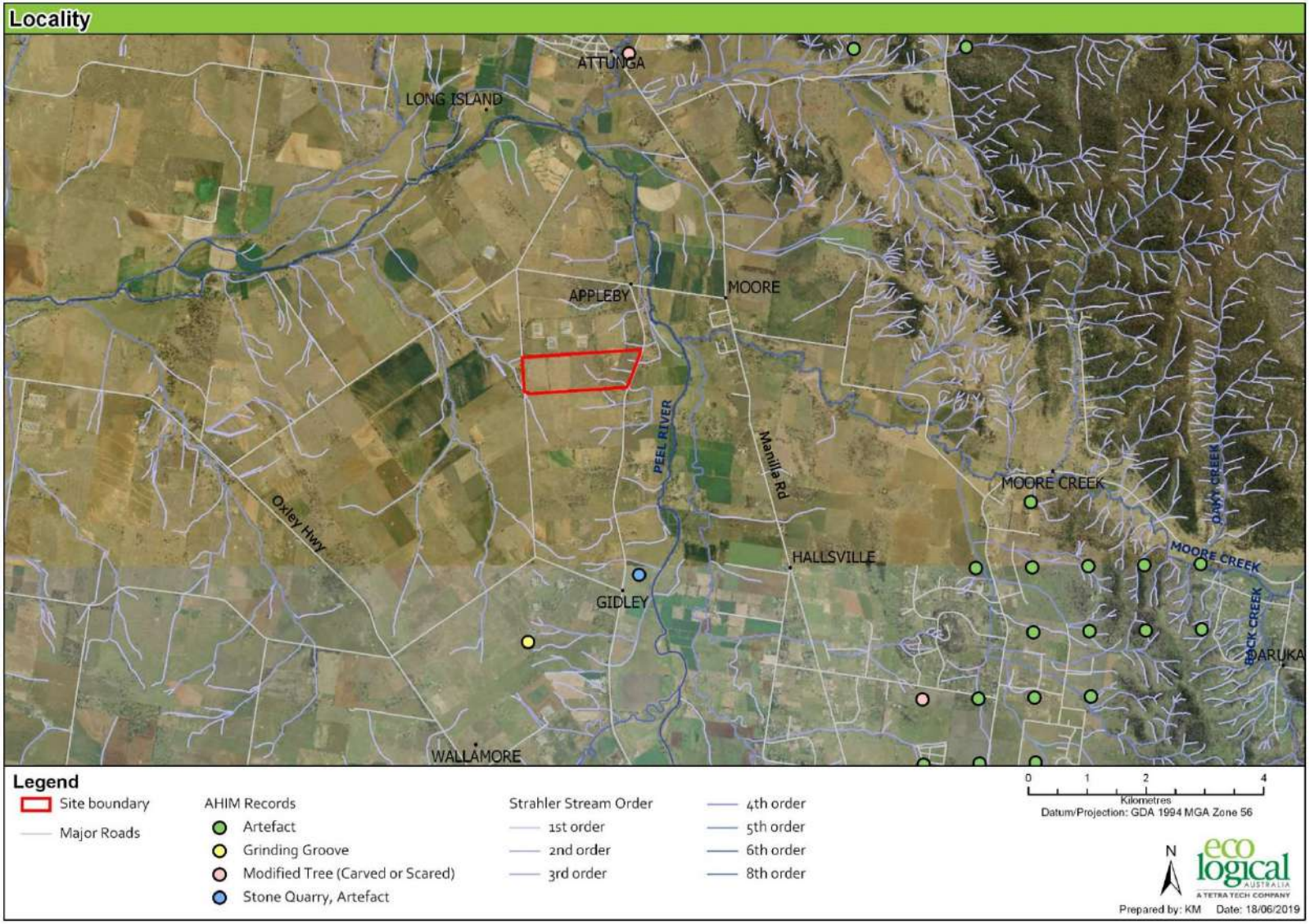

Figure 3: AHIMS registered sites in/within the vicinity of the study area, with hydrological features shown.

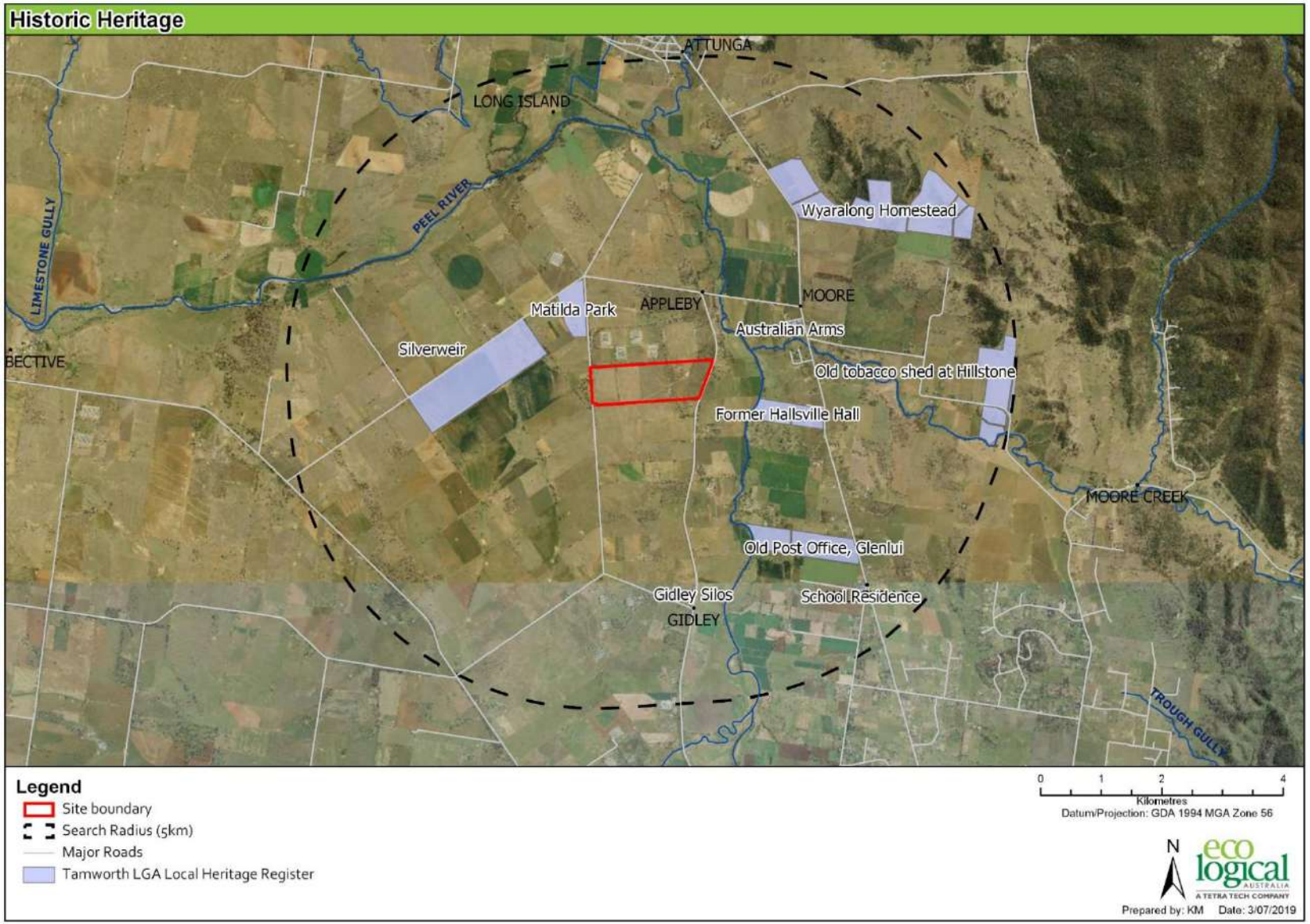

Figure 4:Historic heritage search database results within a 5 km buffer of the study area

2.2.3 Previous archaeological investigations

No previous archaeological studies have been conducted within or in reasonable proximity and relation to the study area whose information is considered significant to the current study.

2.3 Landscape assessment

The proposed site is located on very gently undulating terrain within the Keepit Slopes and Plains Mitchell landscape unit, which slopes down from a minor terrace to the east towards the Peel River. The entirety of the site is within the Red-Brown Earths soil landscape unit (OEH, 2017) (**Figure 5**). These plains continue extensively around the site, before leading into high relief hilly slopes approximately 9 km to the north-east and a prominent ridgeline 20 km to the west.

The site is situated within the Upper Devonian Parry Group (within the New England Orogen), locally consisting of the Mandowa Mudstone (thinly bedded to laminated muds, silts and fine sands with limestone bodies and minor volcanics) and Baldwin Formations (thickly bedded greywacke, arenite, muds and silts) with prominent residual eluvial and alluvial cover (ASUD, 2019; Geoscience Australia, 2019). On site, these lithologies outcrop as thinly laminated silts and muds with prominent volcanic and minor conglomeratic material. Most of the material (excepting the larger sedimentary and conglomeratic material which has been alluvially deposited) has undergone low-grade regional metamorphism, producing a highly fragmented rock unsuitable for stone tool production.

The main hydrological feature is the Peel River (Strahler 8th order) located ~900m to the east. Three highly modified and dammed ephemeral streams (Strahler 1st order) are located within the eastern portion of the site and flow from the minor terrace to connect to the Peel River. Several other 1st order ephemeral streams connecting to the Peel River surround the site, with three within 200m (**Figure 3**).

A number of factors influence the likelihood of Aboriginal objects being present in the landscape. The CoP states that further investigation in the form of a visual inspection must be conducted if activities are proposed to be:

- within 200 m of waters, or
- located within a sand dune system, or
- located on a ridge top, ridge line or headland, or
- located within 200 m below or above a cliff face, or
- within 20 m of or in a cave, rock shelter, or a cave mouth
- and is on land that is not disturbed land

The definition of disturbed land is as follows:

"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable."

Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks" (DECCW 2010).

The area of proposed works is not located within 200 m above or below a cliff face, within 20 m of or in a cave, rock shelter, on a ridgetop, headland, sand dune or in a cave mouth. Six 1st order ephemeral streams are located within 200 m of the site, three of which are located within the site boundary. These watercourses are not expected to have high archaeological potential given their ephemerality, location on highly disturbed and modified land, and high erosion potential. Given this, the lack of archaeologically sensitive landscape features indicates the site to have a low archaeological potential. The existing landscape shows high levels of previous disturbance due to agricultural operations, previous clearing, excavations, damming and earth stockpiling.

2.4 Predictive model

Based on the material evidence and range of archaeological sites across the region, it is clear that Aboriginal people have been utilising the land and resources within the New England Region for thousands of years. The predictive model outlined in **Table 6** below has been developed for the study area based on the AHIMS search results, landscape assessment and regional and local Aboriginal archaeological context outlined above.

Table 6: Predictive Model

Site Type	Description
Open camp sites / stone artefact scatters / isolated finds	Open camp sites represent past Aboriginal subsistence and stone knapping activities, and include archaeological remains such as stone artefacts and hearths. This site type usually appears as surface scatters of stone artefacts in areas where vegetation is limited and ground surface visibility increases. Isolated finds may represent a single item discard event, or be the result of limited stone knapping activity. The presence of such isolated artefacts may indicate the presence of a more extensive, in situ buried archaeological deposit, or a larger deposit obscured by low ground visibility. The site shows no evidence of these types of deposit, nor does it have high potential for these features
Potential Archaeological Deposit	Potential Archaeological Deposits (or PADs) are areas where there is no surface expression of stone artefacts, but due to a landscape feature there is a strong likelihood that the area will contain buried deposits of stone artefacts. There are no distinctive landscape features within the proposed site that would be conducive of PADs. There are previously recorded sites nearby (near ridges, prominent hills and watercourses), and the Peel River does have archaeological potential associated with it – the site will not have any effects outside of the proposed boundary, so these risks are mitigated.
Scarred or carved trees	Tree bark was utilised by Aboriginal people for various purposes, including the construction of shelters (huts), canoes, paddles, shields, baskets and bowls, fishing lines, cloaks, torches and bedding, as well as being beaten into fibre for string bags or ornaments (sources cited in Attenbrow 2002: 113). Trees may also have been scarred in order to gain access to food resources (e.g. cutting toe-holds so as to climb the tree and catch possums or birds), or to mark locations such as tribal territories. Such scars, when they occur, are typically described as scarred trees. No culturally marked trees are present within the site.
Axe grinding grooves	Grinding grooves are the physical evidence of tool making or food processing activities undertaken by Aboriginal people. The manual rubbing of stones against other stones creates grooves in the rock; these are usually found on flat areas of abrasive rock such as sandstone. No grinding groove features are present within the site. Whilst grinding grooves are recorded in the region, locally the site has no outcropping features within or nearby that would be suitable for these features.
Bora / ceremonial	Aboriginal ceremonial sites are locations that have spiritual or ceremonial values to Aboriginal people. Aboriginal ceremonial sites may comprise natural landforms and, in some cases, will also have

Site Type	Description
	archaeological material. Bora grounds are a ceremonial site type, usually consisting of a cleared area around one or more raised earth circles, and often comprised of two circles of different sizes, connected by a pathway, and accompanied by ground drawings or mouldings of people, animals or deities, and geometrically carved designs on the surrounding trees. No landscape or alteration features are present to suggest a bora / ceremonial ground.
Burial	These types of sites are most likely to occur in locations of Aboriginal and settler interaction, such as on the edge of pastoral properties or towns. Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics by Aboriginal people or be sites of Aboriginal occupation in the historical period. No records indicate interaction or burials within or near this site. These features were not observed in the field survey.
Contact historical sites	Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics by Aboriginal people or be sites of Aboriginal occupation in the historical period. No records indicate contact near this site and there are no historical places associated with the site.

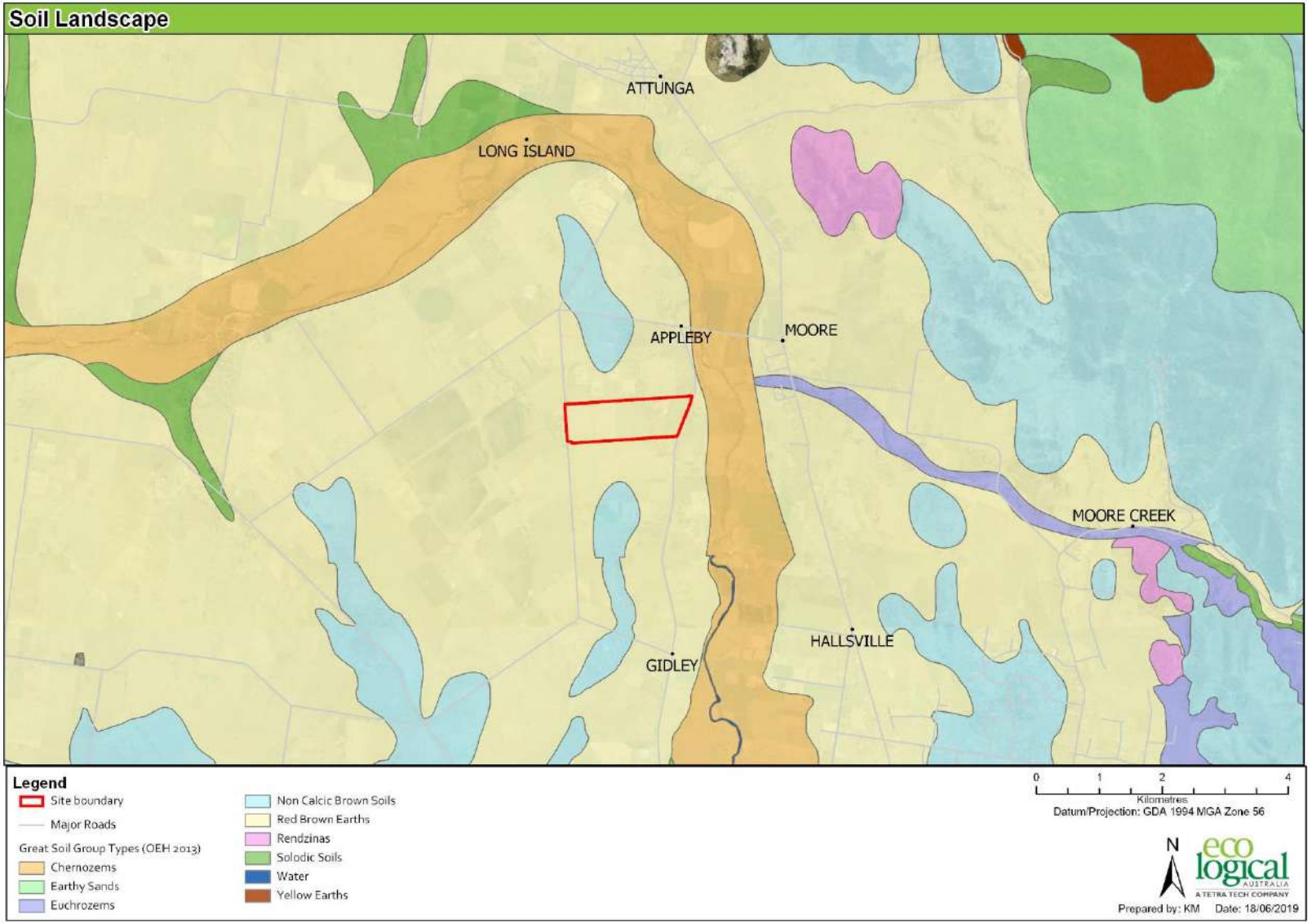

Figure 5: Soil landscapes of the study area.

2.5 Impact avoidance assessment

Database searches for indigenous archaeological items returned results within the regional vicinity with the closest two being ~3.19 km and ~4.27 km to the south with most other sites towards the south-east between ~6 – 12 km away and to the north-east between ~5 – 8.6 km away. Items of historical heritage are also present within a 5km buffer of the site area.

The proposed works will not impact any known sites. Due to the existing highly disturbed condition of the site and the lack of archaeologically sensitive landscape features there is low potential for an intact subsurface archaeological deposit to exist in the study area. Further works in the form of an Aboriginal Cultural Assessment (ACHA) are not required.

2.6 Visual inspection

A visual inspection of the study area was undertaken by ELA Archaeologists Andrew Crisp and Matt Elsley on June 13, 2019. A second inspection was carried out by ELA Archaeologist Matt Elsley and Local Aboriginal Lands Council Representative Christopher (Donny) Fermor on August 23, 2019. Visual inspection aimed to identify Aboriginal objects if present and assess the archaeological potential of the study area.

The proposed site consists primarily of cleared agricultural land and is generally flat-lying (**Figure 6a**), undulating more towards the east where the landform becomes a minor terrace (leading to the Peel River approximately 930 m to the east), on which a modified watercourse and household are located (**Figure 6b**). The site has several large established trees mainly within the eastern portion of the site, with a smaller number of trees located along the fence lines in the western area. These are all located within highly disturbed and modified land. All trees were closely inspected for cultural modifications (scarring), and none were observed.

Surface visibility is high, with groundcover being very thin and a large amount of bare earth visible due to previous disturbances. Most areas of bare ground have a low amount of fractured conglomeratic and volcanic material, with tracks and areas of earthworks including stockpiles and dams showing a higher proportion of material. All lithic material present within the site is not conducive to stone tool production. Evidence of previous subsurface disturbance is present with agricultural works (ploughing, fencing and land grading) (**Figure 6c**), damming (**Figure 6d**), soil and rock stockpiling (**Figure 6e**), bunds and residential infrastructure (**Figure 6f**). The site is highly disturbed, has no landscape features suggestive of indigenous use and indicated a low archaeological potential. Three verified artefacts were found during the second survey effort and consist of two small fragmented cores (CC01 and CC02) and one flaked glass fragment (CG01) (**Figures 7a to 7c**) (**Figure 8**). These artefacts were found in close spatial association with the disturbed ephemeral drainage line which leads off the terrace to the Peel River, which is a relatively high point in the immediate local setting and thus the area of the site most likely to contain artefacts. No other artefacts were found after a closer inspection of this drainage feature.

Despite artefacts being found along the terrace area, it is unlikely that an intact archaeological deposit exists in this area due to the high levels of disturbance and the lack of archaeologically sensitive landscape features. It is also not likely that the artefacts observed during the field survey are in their original context. Given that there are artefacts in the area however, there is a low potential for further

finds to be discovered once works begin, mitigations for which are provided in Section 4 and the attached LALC representative assessment (**Appendix C**).

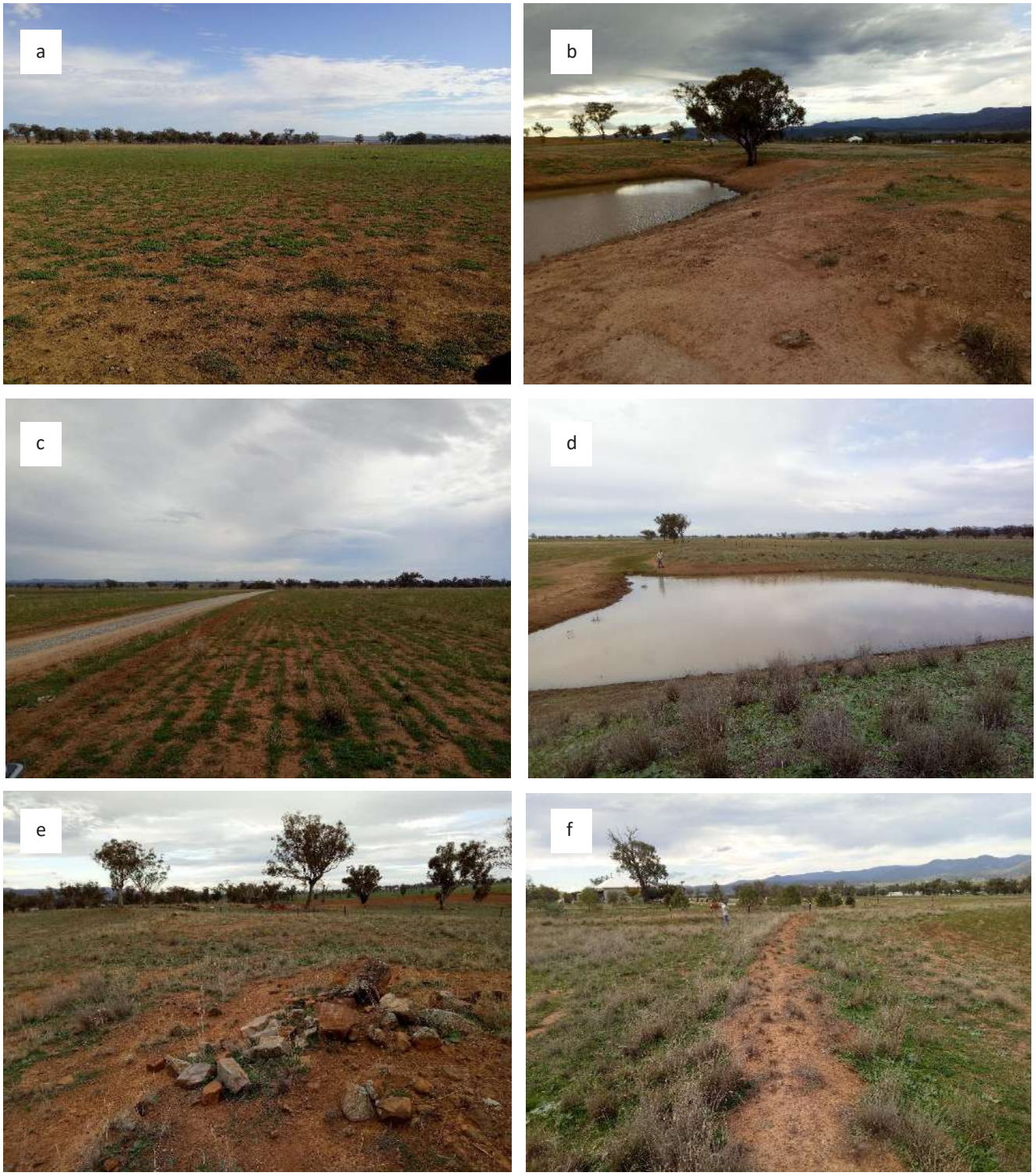

Figure 6: Site Description. (a) General site overview showing surface exposure and flat lying land. (b) Eastern area of the site showing more undulating land and modified watercourse. (c) Agricultural land showing ploughing and grading, as well as fencing and tracks. (d) One of the dams, note the exposure of bare ground and rock chips directly surrounding the dam. (e) Example of rock and soil stockpiling. (f) View showing the residential infrastructure and bunds, the latter of which are common throughout the site – particularly in the eastern area.

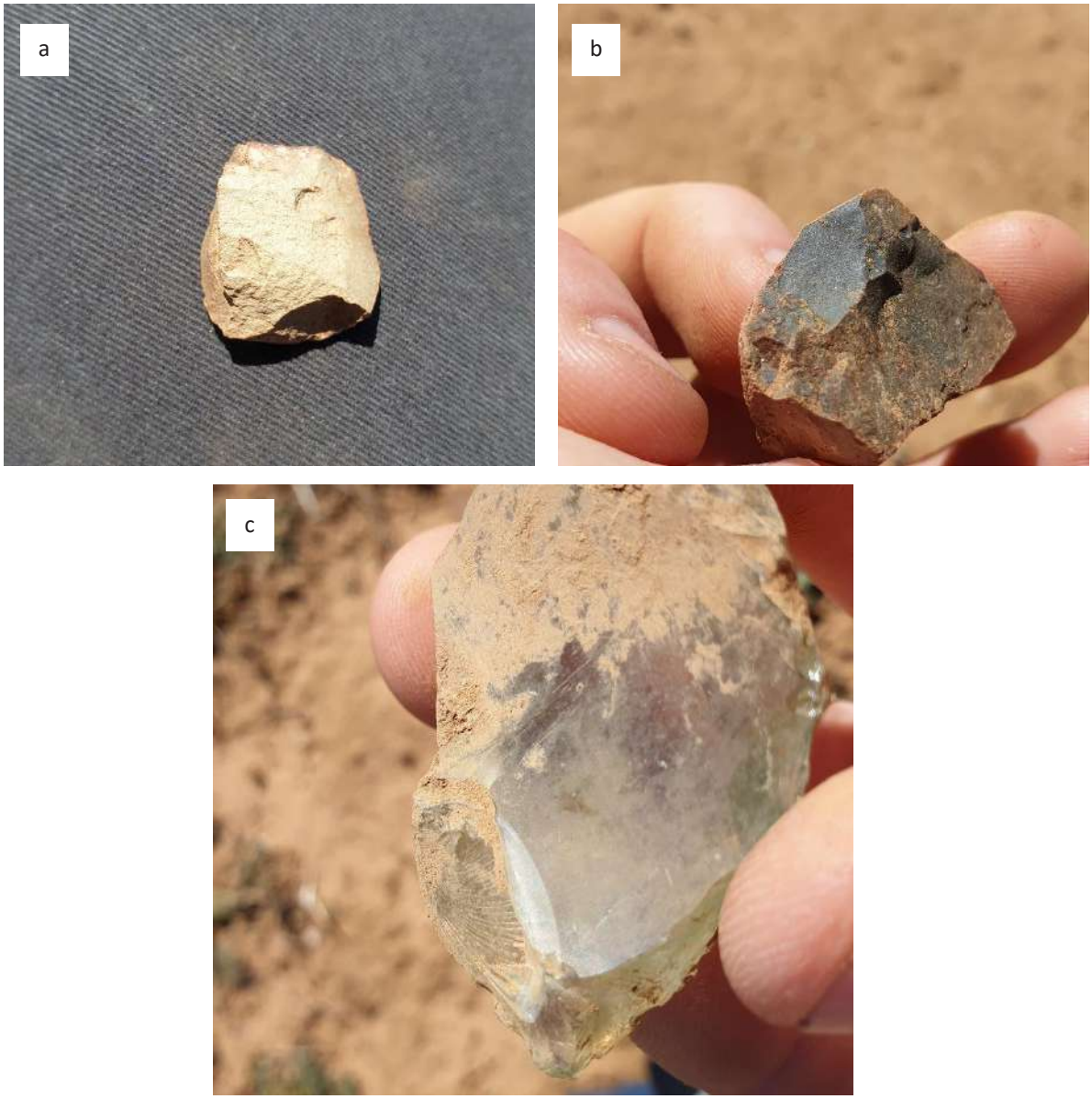

Figure 7: (a) Artefact CC01, 1.5 cm wide fragmented core with 4 flake scars, comprised of chert – evidence of machinery damage. (b) Artefact CC02, 2.4 cm wide fragmented core with 5 flake scars (1 possibly machine damage), comprised of argillite chert. (c) Artefact GC01, 5 cm wide fragment of thick glass – likely the bottom of a bottle as no seams are evident and it is relatively flat – 5 flake scars are present.

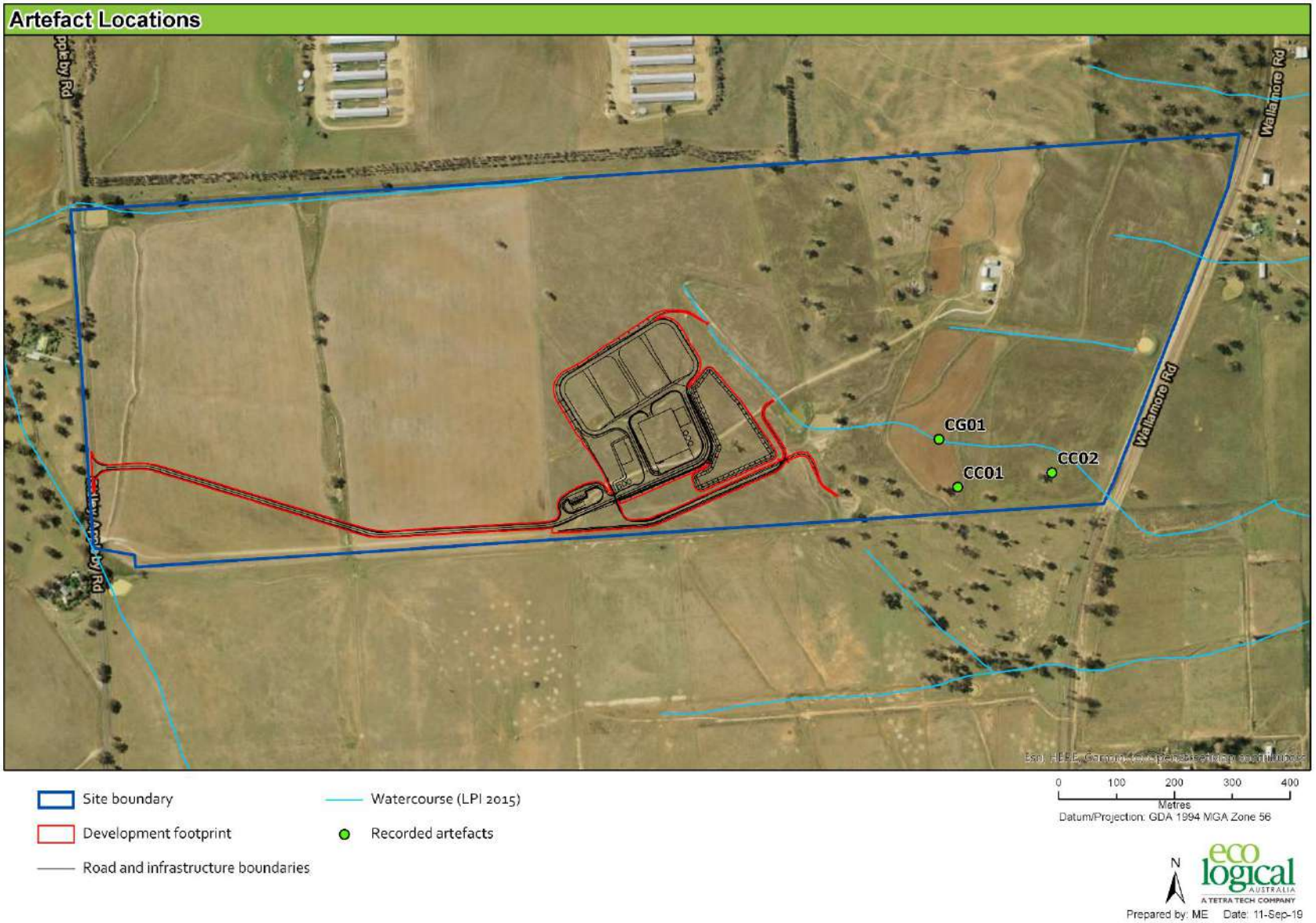

Figure 8: Artefact locations map.

3. Statutory Requirements

Aboriginal objects and places in NSW are afforded protection under the *National Parks and Wildlife Act 1974* (NSW) regardless if they are registered on the Aboriginal Heritage Information Management System (AHIMS) register or not. Strict penalties apply for harm to an Aboriginal object or place without a defence under the Act. Under Section 87 of the Act there are five defences to causing harm to an Aboriginal object:

- The harm was authorised under an AHIP.
- By exercising due diligence and be able to demonstrate this.
- The actions complied with a code of practice as described in the National Parks and Wildlife Regulation 2009, for example, undertaking test excavation in accordance with the '*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*'.
- It was a low-impact activity or omission under the regulation and where you don't know that an Aboriginal object is already present.
- Was an exemption under Section 87A, for example emergency fire-fighting act or bush fire hazard reduction work within the meaning of the *Rural Fires Act 1997*.

If an AHIP application is required, the OEH necessitate that it is supported by an Aboriginal Cultural Heritage Assessment (ACHA) prepared in line with the 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2010)', and a copy an approval for the development or infrastructure under Part 4 or Part 5 of the *Environmental Planning and Assessment Act 1979* (NSW).

Whilst three artefacts were found within the study area, none were within the subject site and will therefore not be impacted by the proposed development, thus an AHIP is not required. However, if the proposed development footprint changes and the identified Aboriginal artefacts are expected to be impacted, an Aboriginal Cultural Heritage Assessment would be required in support of an AHIP application.

4. Conclusions and Recommendations

The purpose of the archaeological due diligence assessment is to identify if there are registered Aboriginal sites and/or sensitive landforms which may indicate the presence of Aboriginal sites and may therefore require further assessment and approval under Part 6 of the *National Parks and Wildlife Act 1974*.

ELA has undertaken searches of the Aboriginal Heritage Information Management System (AHIMS) database maintained by the Office of Environment & Heritage (OEH), a review of available background reports and data and a visual inspection of the proposed works.

Three aboriginal objects were found during the survey however none of these are located within the subject site and will therefore not be impacted. No aboriginal sites were recorded within the proposed development footprint during the survey. The area of proposed works exhibits a low potential for an archaeological deposit near the terrace area to the east of the site, though it is unlikely that any deposit would be intact due to the highly disturbed and modified local setting.

A summary of this archaeological due diligence assessment can be found in Appendix B

Recommendations

Based on the findings of this due diligence and the requirement of the NP&W Act the following is recommended:

Due to the low potential for any intact archaeological deposits and the highly disturbed setting, further works in the form of an Aboriginal Cultural Heritage Assessment (ACHA) is not required

The LALC recommends that the area of potential archaeological deposit be avoided – which is achieved with the current development footprint – in addition to requesting a LALC Site Officer be present when soil is turned to monitor for any artefacts which may be discovered.

Aboriginal objects are protected under the NPW Act regardless if they are registered on AHIMS or not. If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, the OEH must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.

In the extremely unlikely event that human remains are found, works should immediately cease and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.

References

ASUD. (2019). Australian Stratigraphic Units Database. Geoscience Australia. Retrieved from; https://asud.ga.gov.au/

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OEH. (2017). NSW Landscapes (Mitchell 2002). New South Wales Office of Environment and Heritage.

Appendix A : AHIMS Search Results

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 13026_1
Client Service ID : 426940

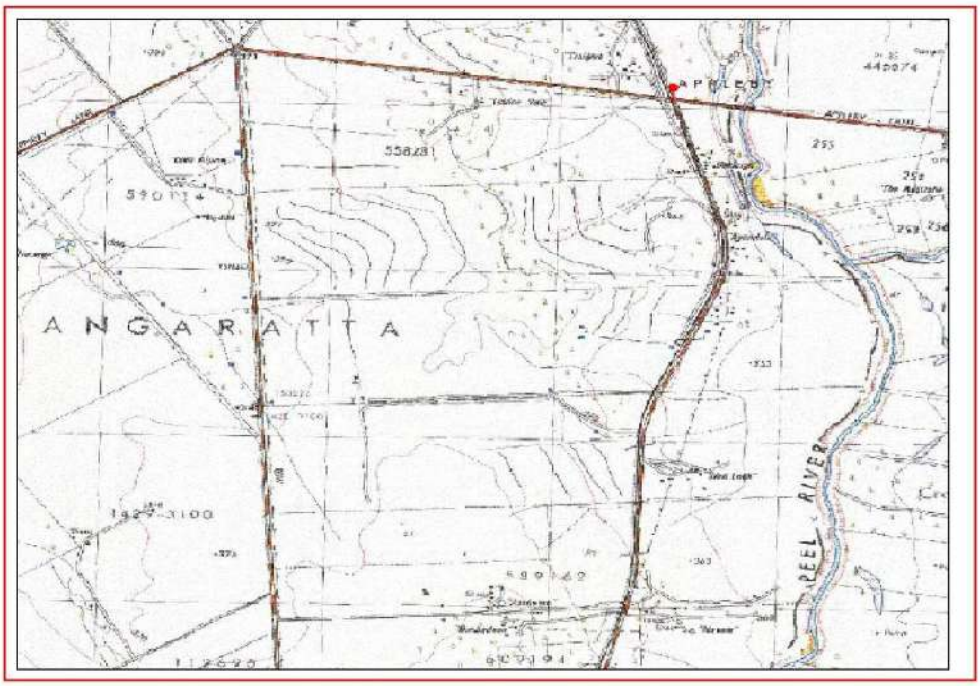
Eco Logical Australia Pty Ltd - Sydney
PO Box 12 668 Old Princes Hwy
Sutherland New South Wales 1499
Attention: Matthew Elsley
Email: matthew.elsley@ecoaus.com.au

Date: 11 June 2019

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 61, DP:DP707563 with a Buffer of 1000 meters, conducted by Matthew Elsley on 11 June 2019.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Local Basic AHIMS Search

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 13026_3
Client Service ID : 426947

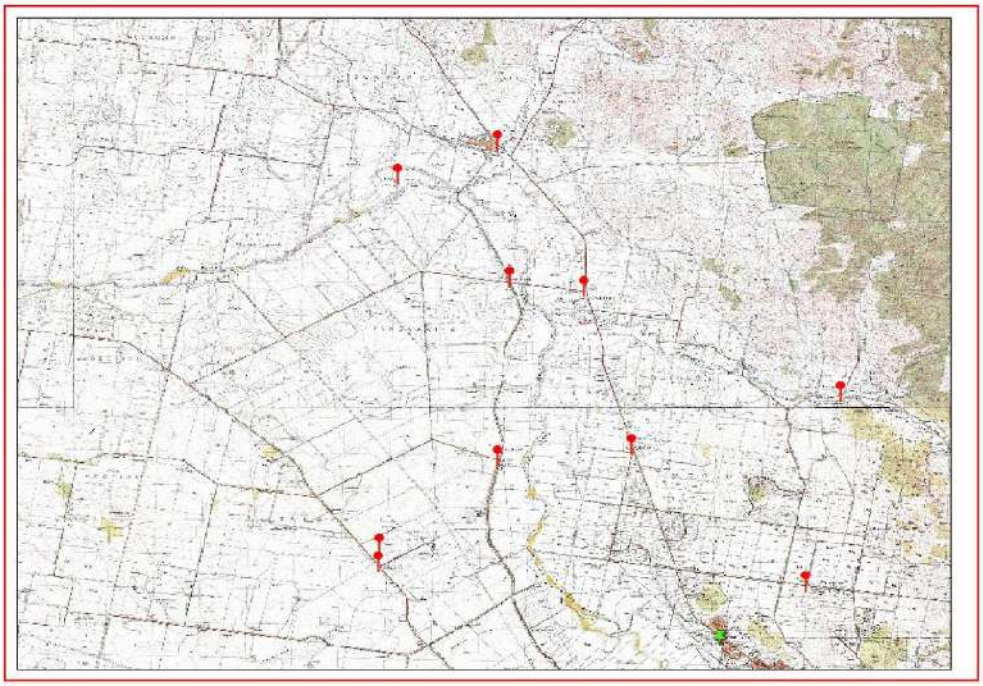
Eco Logical Australia Pty Ltd - Sydney
PO Box 12 668 Old Princes Hwy
Sutherland New South Wales 1499
Attention: Matthew Elsley
Email: matthew.elsley@ecoaus.com.au

Date: 11 June 2019

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.0412, 150.749 - Lat, Long To : -30.922, 150.9379 with a Buffer of 1000 meters, conducted by Matthew Elsley on 11 June 2019.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

89	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Regional Basic AHIMS Search

Extensive search results

Office of Environment & Heritage NSW GOVERNMENT

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 13026_3
Client Service ID : 426947

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
20-5-0003	Moore Creek 10;Moongabah Station;	AGD	56	301000	6568000	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Isabel McBryde					Permits		
20-5-0022	None Specified	AGD	56	298000	6575600	Open site	Valid	Artefact : -	Isolated Find	1951
	Contact	Recorders	Pam Dean-Jones					Permits		
20-5-0023	Attung 15-16;	AGD	56	294500	6576110	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.John Appleton					Permits		
20-5-0024	Attunga 1-3;	AGD	56	295000	6576870	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.John Appleton					Permits		
20-5-0025	Attunga 4-14;	AGD	56	294700	6576150	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr.John Appleton					Permits		
29-2-0072	Marengo 1;	AGD	56	303820	6563250	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0054	Peel River 1;	AGD	56	294850	6566880	Open site	Valid	Artefact : -, Stone Quarry : -	Open Camp Site,Quarry	
	Contact	Recorders	Mr.Jason Wilson,Janice Wilson					Permits		
29-2-0056	Peel River 3;	AGD	56	292990	6565700	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Mr.Jason Wilson,Janice Wilson					Permits		
29-2-0057	Peel River 4;	AGD	56	292870	6565600	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Mr.Jason Wilson,Janice Wilson					Permits		
29-2-0058	Peel River 5;	AGD	56	292900	6565700	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	Mr.Jason Wilson,Janice Wilson					Permits		
29-5-0028	Marengo 1	AGD	56	303820	6563250	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	Archaeological Surveys & Salvage ,Mr.Jason Wilson					Permits		
20-5-0047	INLET ROAD 1 ARTEFACT SHELTER	AGD	56	300530	6577500	Open site	Valid	Artefact : -		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0185	Kurrajong IP/7	AGD	56	301606	6566926	Open site	Valid	Artefact : 5		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0186	Kurrajong Park IP/8	AGD	56	301517	6566874	Open site	Valid	Artefact : 3		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0187	Kurrajong Park IP/9	AGD	56	301607	6566818	Open site	Valid	Artefact : 9		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0188	Kurrajong Park IP/10	AGD	56	301429	6566400	Open site	Valid	Artefact : 1		99317

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Your Ref/PO Number : 13026_3

Client Service ID : 426947

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0189	Kurrajong Park IP/11	AGD	56	301432	6566516	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0163	Moore Creek IP/109	AGD	56	303880	6566103	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0164	Moore Creek IP/108	AGD	56	303748	6566101	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage					**Permits**		
29-2-0165	Moore Creek IP/107	AGD	56	303374	6566101	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0166	Moore Creek IP/106	AGD	56	303680	6566522	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0167	Moore Creek IP/105	AGD	56	303540	6566828	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0168	Moore Creek IP/104	AGD	56	303731	6567105	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0170	Moore Creek IP/102	AGD	56	304008	6567360	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
29-2-0171	Moore Creek IP/101	AGD	56	303976	6567388	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**		
20-5-0049	NRA 1:Attunga State Forest	AGD	56	300539	6576115	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Ivan Johnson					**Permits**		
29-2-0190	Kurrajong Park IP/12	AGD	56	301429	6566400	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0191	Kurrajong Park IP/13	AGD	56	301373	6566544	Open site	Valid	Artefact : 2		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0192	Kurrajong IP/14	AGD	56	301024	6566688	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0193	Kurrajong Park IP/15	AGD	56	300937	6566750	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0194	Kurrajong Park IP/16	AGD	56	300814	6566750	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0195	Kurrajong Park IP/17	AGD	56	300981	6566698	Open site	Valid	Artefact : 1		99317
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**	2693	
29-2-0196	Kurrajong Park IP/18	AGD	56	302094	6567398	Open site	Valid	Artefact : 2		99317

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0197	Kurrajong Park IP/19	AGD	56	301779	6567457	Open site	Valid	Artefact : 1		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0198	Kurrajong Park IP/20	AGD	56	301691	6567465	Open site	Valid	Artefact : 1		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0199	Kurrajong Park IP/21	AGD	56	301653	6567774	Open site	Valid	Artefact : 27		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0200	Kurrajong Park IP/22	AGD	56	301166	6567401	Open site	Valid	Artefact : 1		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0201	Kurrajong Park IP/23	AGD	56	301009	6567057	Open site	Valid	Artefact : 1		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0179	Kurrajong IP/1	AGD	56	301918	6566458	Open site	Valid	Artefact : 24		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0180	Kurrajong IP/2	AGD	56	301802	6566506	Open site	Valid	Artefact : 15		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0181	Kurrajong IP/3	AGD	56	301668	6566863	Open site	Valid	Artefact : 9		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0182	Kurrajong Park IP/4	AGD	56	301844	6566912	Open site	Valid	Artefact : 2		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0183	Kurrajong Park IP/5	AGD	56	301865	6567096	Open site	Valid	Artefact : 1		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0184	Kurrajong Park IP/6	AGD	56	301574	6567003	Open site	Valid	Artefact : 10		99317
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits	2693	
29-2-0172	Hills Plain IP/10	AGD	56	299790	6563340	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	3153,3154	
29-2-0229	IP-15	AGD	56	301015	6565757	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0230	IP-16	AGD	56	301118	6565750	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0231	IP-17	AGD	56	301216	6565739	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0232	IP-18	AGD	56	301023	6565831	Open site	Valid	Artefact : 1		
	Contact S Scanlon	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0233	IP-19	AGD	56	301189	6565136	Open site	Valid	Artefact : 1		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0234	IP-20	AGD	56	301010	6565251	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0215	IP-1	AGD	56	301832	6565060	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0216	IP-2	AGD	56	301835	6565762	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0217	IP-3	AGD	56	301668	6565863	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0218	IP-4	AGD	56	301815	6565762	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0219	IP-5	AGD	56	301797	6565560	Open site	Valid	Artefact : 11		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0220	IP-6	AGD	56	302579	6565803	Open site	Valid	Artefact : 50		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
20-5-0056	Forest Fields IP3	AGD	56	301668	6568630	Open site	Deleted	Artefact : 1		
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits		
29-2-0235	Forest Fields IP5	AGD	56	301797	6565560	Open site	Deleted	Artefact : 11		
	Contact T Russell	Recorders	Archaeological Surveys & Salvage					Permits		
29-2-0236	Tamworth Hills Plain 2 (THP 2)	AGD	56	301292	6563749	Open site	Valid	Artefact : 7		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0237	THP 5	AGD	56	301133	6564104	Open site	Valid	Artefact : 6		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0238	THP 4	AGD	56	301455	6564119	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0239	THP 3	AGD	56	301500	6563843	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0240	THP 7	AGD	56	301363	6563089	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0241	THP6	AGD	56	301498	6563160	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0242	THP 8	AGD	56	301490	6564895	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0221	IP-7	AGD	56	302008	6565354	Open site	Valid	Artefact : 2		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0222	IP-8	AGD	56	302509	6565245	Open site	Valid	Artefact : 11		
	Contact	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0223	IP-9	AGD	56	302505	6565380	Open site	Valid	Artefact : 5		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0224	IP-10	AGD	56	302413	6565625	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0225	IP-11	AGD	56	302047	6565516	Open site	Valid	Artefact : 7		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0226	IP-12	AGD	56	302297	6565844	Open site	Valid	Artefact : 12		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0227	IP-13	AGD	56	301829	6565606	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0228	IP-14	AGD	56	301334	6565708	Open site	Valid	Artefact : -		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2387,2388	
29-2-0208	Glenmore IP/1	AGD	56	300630	6564902	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0209	Glenmore IP/2	AGD	56	300632	6564706	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0210	Glenmore IP/3	AGD	56	300279	6564734	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0211	Glenmore IP/4	AGD	56	300226	6564626	Open site	Valid	Artefact : 7		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0212	Glenmore IP/5	AGD	56	300156	6564370	Open site	Valid	Artefact : 1		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0213	Glenmore IP/6	AGD	56	300001	6564717	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Archaeological Surveys & Salvage					Permits	2663	
29-2-0258	Rockleigh 1P/3	AGD	56	299425	6563918	Open site	Valid	Artefact : 1		
	Contact	Recorders	Archaeological Surveys & Salvage ,Tamworth LALC,Ivan Johnson					Permits	3125,3148	
29-2-0259	Rockleigh ST1	AGD	56	299543	6564547	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Archaeological Surveys & Salvage ,Ivan Johnson					Permits	3125,3148	
29-2-0260	Rockleigh 1P/2	AGD	56	299222	6564284	Open site	Valid	Artefact : 24		
	Contact	Recorders	Archaeological Surveys & Salvage ,Ivan Johnson					Permits	3125,3148	

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0261	Rockleigh 1P/1	AGD	56	299223	6564206	Open site	Valid	Artefact : 10		
	Contact	**Recorders**	Archaeological Surveys & Salvage ,Ivan Johnson					**Permits**	3125,3148	
29-2-0106	Hills Plain 1	AGD	56	303060	6562750	Open site	Valid	Stone Quarry : -, Artefact : -	Open Camp Site,Quarry	
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0055	Peel River 2;	AGD	56	293100	6565900	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Mr.Jason Wilson,Janice Wilson					**Permits**		
29-2-0305	Bournes Lane 1	GDA	56	302580	6564800	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Mr.Patrick Gaynor					**Permits**		
20-5-0079	Attunga Creek DP1	GDA	56	294224	6575856	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Patrick Gaynor					**Permits**		
20-5-0080	Attunga Creek ST1	GDA	56	294177	6575857	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Mr.Patrick Gaynor					**Permits**		

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Appendix B : Archaeological Due Diligence Assessment Summary

Due diligence is defined in the CoP as "*taking reasonable and practical steps to determine whether a person's actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm*". The following section relates to the generic due diligence process as applied to the study area.

Step 1 – Will the activity disturb the ground surface or any culturally modified trees?

Yes. The proposed works will require surface disturbance associated with shallow excavation works for access roads and site infrastructure, as well as deeper excavations for the construction of a leachate dam.

There are no culturally modified trees recorded within the area of proposed works.

Step 2 – Are there any a) relevant confirmed site records on AHIMS, other sources of information, or b) landscape features that are likely to indicate presence of Aboriginal objects?

Consequently, if your proposed activity is:

Within 200m of waters, or

located within a sand dune system, or

located on a ridge top, ridge line or headland, or

located within 200m below or above a cliff face, or

within 20m of or in a cave, rock shelter, or a cave mouth;

and is on land that is not disturbed land then you must go to step 3.

"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.

Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks."(DECCW 2010)

The area of proposed works is not located within 200 m below or above a cliff face, within 20 m of or in a cave, rock shelter, or a cave mouth.

Though waters are located within 200m of the site, these have been assessed as not archaeologically significant.

No registered AHIMS sites are located within 200 m of the proposed area of works.

This assessment found that the area of proposed works displays high levels of previous ground disturbance. Due to previous workings and clearing, it is unlikely that an intact subsurface archaeological deposit will be present within the site. The local area surrounding the site is moderately to highly disturbed due to previous land clearing and agricultural development.

No landscape features near or in relation to the area of proposed works indicate high potential for expected archaeological deposits.

Step 3 – Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?

The proposed works will not impact on any known Aboriginal archaeological sites.

Regardless of the low archaeological potential of the area, predictive modelling indicates that potential subsurface Aboriginal sites are not likely to be impacted during these works.

Step 4 – Does the desktop and visual assessment confirm that there are Aboriginal objects or that they are likely?

The evidence collected during the assessments demonstrates that the site area is located locally within a low archaeological potential landform unit, and that Aboriginal sites are not expected to be present. Three artefacts were found during the visual inspection, though these are located in a highly disturbed area and their original context is therefore unknown. The proposed works subject site are is located away from these artefacts and thus will not impact any know aboriginal objects as a result of the development.

Conclusions

The purpose of the archaeological heritage due diligence is to identify if there are registered Aboriginal sites and/or sensitive landforms which may indicate the presence of Aboriginal sites and may therefore require further assessment and approval under Part 6 of the *National Parks and Wildlife Act 1974*.

ELA has undertaken searches of the Aboriginal Heritage Information Management System (AHIMS) database maintained by the Office of Environment & Heritage (OEH), a review of available background reports and data and a visual inspection of the proposed works.

Three aboriginal objects were found during the survey however none of these are located within the subject site and will therefore not be impacted. No aboriginal sites were recorded during the survey. The area of proposed works exhibits a low potential for an archaeological deposit near the terrace area to the east of the site, though it is unlikely that any deposit would be intact due to the highly disturbed and modified local setting.

Recommendations

Based on the findings of this due diligence and the requirements of the NP&W Act the following is recommended:

- Due to the low potential for any intact archaeological deposits and the highly disturbed setting, further works in the form of an Aboriginal Cultural Heritage Assessment (ACHA) is not required.

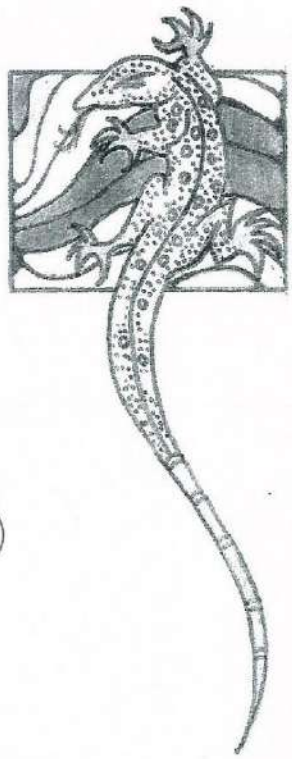
- The LALC recommends that the area of potential archaeological deposit be avoided – which is achieved with the current development footprint – in addition to requesting a LALC Site Officer be present when soil is turned to monitor for any artefacts which may be discovered.
- Aboriginal objects are protected under the NPW Act regardless if they are registered on AHIMS or not. If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, the OEH must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.
- In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.

Appendix C : Local Aboriginal Lands Council Site Assessment Report

Tamworth Local Aboriginal Land Council
ABN: 38919784345

PO Box 57
123 Marius Street
Tamworth NSW 2340

Phone: 02 67669028
Fax: 02 67669036
Email: tamworth.lalc@bigpond.com



SITE INSPECTION REPORT

Customer

Name: Eco logical (Matthew Elsley

Address: Armidale

Phone: 02 8081 2624

Contact Person: Matthew Elsley

Purchase Order: _____

Tamworth Local Aboriginal Land Council Contact

Site inspector name: Christopher (Donny) Fermor

Site inspection dates: 23.8.19

Hours worked: 11.10 – 2:30

Site Location

Gidley-~~PPP~~ Appleby Rd

Costs

Travel (Kilometers): _____

Invoice Sent 27/8/2019
Entered onto Sites Register

Land Form Farm

Vegetation Grass - Light Tree Coverage

Land Use Farming

Water Peel River

Current Land Tenure

- ∇ Public
- ∇ National Park/other Government Dept.
- ∇ Private

General site information

Features

- ∇ Ceremony and Dreaming
- ∇ Resource and Gathering
- ∇ Art
- ∇ Artifact
- ∇ Burial
- ∇ Ceremonial Ring
- ∇ Conflict
- ∇ Earth Mound
- ∇ Fish Trap
- ∇ Grinding Groove
- ∇ Habitation Structure
- ∇ Non-Human Bone and Organic Material
- ∇ Ochre Quarry
- ∇ Shell
- ∇ Stone Arrangement
- ∇ Modified Tree
- ∇ Water Hole

Site Report by Inspector

5? · Artefacts Found
Hearely used for Farming Pratice
Small unknown, Dry Crk (From Dam to Railway Lines) Could be a Protential archaeological deposit
This Were, All Artefacts was Found, if development go ahead Site Officer, Needs to be onSite, When, the Soil is turned to Monitor

Artifact Details:

5 Artefound 4, Flakes
1 Gloss, Core

Prepared by: Christopher (Donny) Ferm
Date Prepared: 23.8.10
Name of Sites Officer: AS ABOVE
Sites Officer's Signature:

ecological AUSTRALIA
A TETRA TECH COMPANY

bsi. ISO 9001 Quality Management
bsi. AS/NZS 4801 Occupational Health and Safety Management
bsi. ISO 14001 Environmental Management

1300 646 131
www.ecoaus.com.au

Geotechnical Assessment

Appendix J

pitt&sherry

Pitt and Sherry

Geotechnical Assessment

Proposed Organics & Recycling Facility

284 Gidley-Appleby Road, Gidley

Report No. RGS31861.1-AB Rev. 1

14 August 2019

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS31861.1-AB Rev. 1

14 August 2019

Pitt and Sherry
Level 9, North Tower
1-5 Railway Street
CHATSWOOD NSW 2067

Attention: Doug Johnston

Dear Doug

RE: Proposed Organics & Recycling Facility – 284 Gidley-Appleby Road, Gidley
Geotechnical Assessment

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a geotechnical assessment at 284 Gidley-Appleby Road, Gidley, where it is proposed to construct a new organics and recycling facility.

The investigation encountered a residual soil profile that grades into weathered siltstone at depths of between 0.35 and 0.9m.

Presented herein are comments and recommendations regarding earthworks, foundations and pavement construction.

If you have any questions regarding this project, please contact the undersigned.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

Simon Keen

Senior Geotechnical Engineer

Reviewed by

Adam Holzhauser

Associate Geotechnical Engineer

Regional Geotechnical Solutions Pty Ltd
ABN 51141848820

Unit 14, 25-27 Hurley Drive
Coffs Harbour NSW 2450
Ph. (02) 6650 0010

Email adam.h@regionalgeotech.com.au
Web: www.regionalgeotech.com.au

Table of Contents

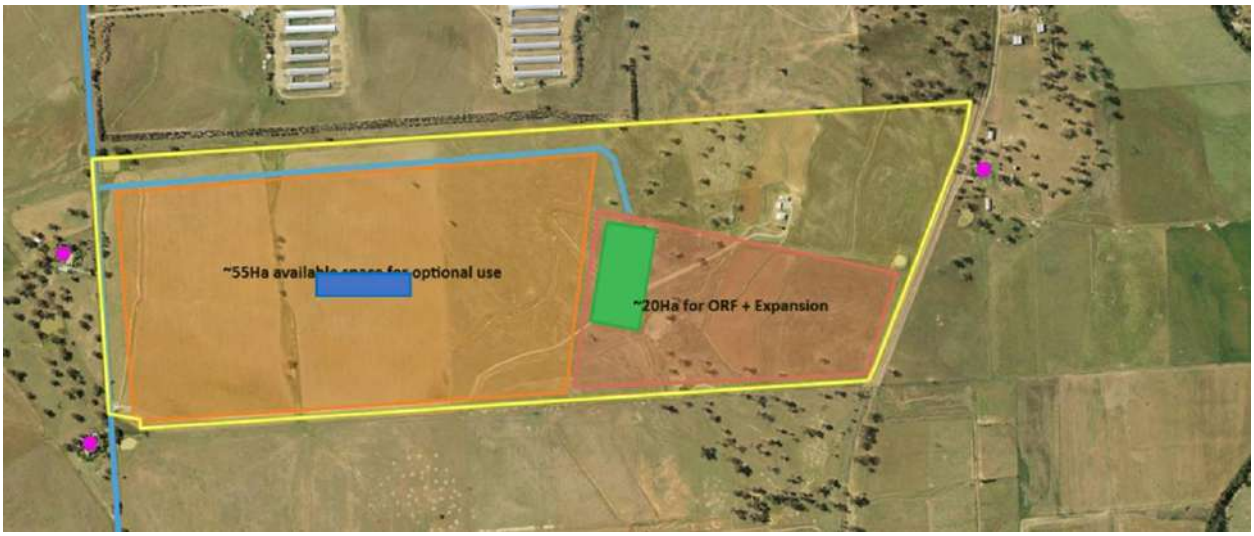
Figures

Appendices

1 INTRODUCTION

Regional Geotechnical Solutions Pty Ltd (RGS) have undertaken a geotechnical assessment for the organics and recycling facility that is proposed to be constructed at 284 Gidley-Appleby Road, Gidley (Lot 61 DP707563).

Only limited information has been provided of the proposed development, including that a concrete slab is proposed for the area shaded in green below, and the location of a proposed access road.



Provided concept plan for the proposed organics and recycling facility. A concrete slab is proposed for the area covered by a green box. An access road is proposed in the area covered by a blue line.

The purpose of the assessment was to provide comments and recommendations on the following:

- General site conditions and geology including soil and rock profile and groundwater conditions;
- Site earthworks including;
    - Excavation conditions;
    - Fill placement and compaction control;
    - Retention, retaining wall options and design parameters;
    - Reuse of site won material;
- Site Classification, including an assessment of predicted shrink-swell related ground surface movements (y_s values) in accordance with AS2870 – 2011;
- Suitable footing types and foundation design parameters; and
- Pavement construction. No pavement thickness designs have been provided at this stage but can be provided if required.

The report has been prepared based on the geotechnical site assessment and laboratory testing undertaken by East West Enviroa Pty Ltd (East West). The results of which have been discussed herein and presented in the Appendices.

2 SCOPE OF WORK

2.1 Field Work

Fieldwork for the assessment was undertaken by East West on 17 June 2016 and comprised the following:

- A general site walkover and observation of the site conditions;
- The excavation of five test pits (TP1 to TP5) across the site with a small excavator; and
- Collection of samples for laboratory analysis as discussed below.

The fieldwork was undertaken by an experienced Geotechnician from East West. Engineering logs are presented in Appendix A. The approximate location of the boreholes is presented on Figure 1.

2.2 Laboratory Testing

Samples collected during the fieldwork were returned to East West's NATA registered laboratory where the following testing was undertaken.

- Two shrink-swell tests to assist with the assessment of site classification;
- Two Emerson Crumb tests to assess soil dispersiveness; and
- Two CBR tests on expected pavement subgrade materials.

3 SITE CONDITIONS

3.1 Surface Conditions

The site is located within a region characterised by gently undulating residual slopes that grade down in varying directions at grades of generally less than about 5°. Typical site photographs are presented below.

Looking east across the site which is gently undulating

Weathered mudstone and shale exposed within one of the test pits

3.2 Subsurface Conditions

The 1:100,000 Manilla Geology Map indicates that the site is underlain by residual soil that overlies weathered mudstone, sandstone and shale.

The materials encountered within the test pits undertaken during the investigation are summarised in Table 1. Further details are presented on the attached engineering logs.

Table 1: Summary of Subsurface Materials

Material Name	Material Description	Depth to Base of Material Layer (m)				
		TP1	TP2	TP3	TP4	TP5
Topsoil	SILT, low plasticity, brown	0.15	0.5	0.1	0.1	0.15
Residual Soil	CLAY and Gravelly CLAY, medium plasticity, very stiff to hard	--	0.9	0.4	0.35	0.5
XW Siltstone	Extremely weathered, very low strength	0.8	1.3	1.1	0.8	--
DW Siltstone	Distinctly weathered, very low to low strength	≥ 1.3*	≥ 1.4*	≥ 1.4*	≥ 1.1*	≥ 0.6*

Note: ≥ Indicates that base of material layer was not encountered
* indicates that the test was terminated due to practical excavator refusal
-- Indicates that the material was not encountered at the test location

Groundwater was not encountered within the test pits. Groundwater levels do fluctuate due to inclement weather, seasonal variations, or due to reasons that may not have been apparent at the time of the site investigation.

Laboratory test results are summarised in Table 2. Test result sheets are presented in Appendix B.

Table 2: Summary of Laboratory Test Results

Test Pit Location	Sample Depth (m)	Material type	Shrink-Swell Index (%)	Emerson Class	Natural Moisture Content (%)	Optimum Moisture Content (%)	Maximum Dry Density (t/m³)	CBR Swell (%)	CBR (%)
TP2	0.5 – 0.8	Residual Gravelly CLAY	1.6	5	--	--	--	--	--
TP3	0.4 – 0.7	XW Siltstone	--	--	11.2	15.7	1.86	0.2	8
TP4	0.1 – 0.35	Residual Gravelly CLAY	1.6	5	--	--	--	--	--
TP5	0.15 – 0.5	Residual CLAY	--	--	22.3	24.2	1.58	2.2	5

NOTE:

1. *No laboratory testing was undertaken on samples recovered from TP1 due to the shallow rock profile encountered.*

4 GENERAL SITE CONDITIONS AND GEOTECHNICAL CONSIDERATIONS

The investigations indicate the subsurface profile that consists of topsoil to varying depths that overlies moderately reactive residual clays to between 0.35 and 0.9m, over weathered siltstone that resulted in practical excavator refusal at shallow depths.

The clays will be susceptible to moisture and on exposure the reactive clay subgrade will soften rapidly and site trafficability will become an issue during and following prolonged or heavy rainfall. The use of construction platforms comprising durable crushed rock or recycled concrete should be allowed for during construction, particularly in high traffic areas such as site access points and site compounds.

Appropriate cross falls should be maintained during and following site works to promote surface drainage. The surface of any exposed subgrade or fill layers should be sealed with a smooth drum roller at the end of each day's work to reduce the potential for moisture ingress. Batters and stockpiles should also be trimmed smooth.

The clay subgrade has reasonable CBR values (in the order of 5%), however, given the reactive nature of the soils and susceptibility to moisture, the implementation of good drainage as outlined in Section 7 will be critical to the long term performance of the pavement.

Geotechnical challenges for the proposed development and earthworks at this site include:

- Moderately reactive, moisture sensitive clay soils;
- Shallow weathered rock profile; and
- Low natural cross falls with resulting poor drainage conditions.

5 EARTHWORKS

5.1 Excavation Conditions

Proposed excavation depths have not yet been provided.

Excavation of the residual soil and extremely weathered siltstone will be achievable with a medium sized excavator of at least about 8 tonne. Excavation of the distinctly weathered mudstone encountered within the investigation will require a large excavator of at least 20 tonne, however, if higher strength or less fractured rock is encountered a single tyne ripper or a hydraulic rock breaker may be required.

5.2 Excavation Support & Earth Retention

All excavations on site must comply with the Safework Australia '*Excavation Work Code of Practice*' (March 2015). Vertical batters should not be undertaken without appropriate engineer designed support measures. Where space permits, temporary or permanent batter slopes (or equivalent benches with a maximum bench height of 1.2m) may be adopted at the site. Recommended maximum temporary and permanent batters are presented in Table 3.

Table 3: Recommended Maximum Temporary & Permanent Batters

Material	Temporary Batter[2]	Permanent Batter
Controlled Fill[1]	1H:1V[2]	2H:1V
Residual Soil	1H:1V[2]	2H:1V
Weathered Siltstone	1H:1V	2H:1V[3]

Notes: 1 *Fill placed under Level 1 conditions as defined by AS3798-2007 and summarised in Section 6.5*

2 *Up to a maximum height of 3m*

3 *Steeper batters such as 1.5H:1V may be adopted, however, the batters will be prone to fretting which may result in localised spoil deposits along the toe batter toe that would require additional maintenance to remove the spoil. A horizontal set back of at least half the height of the cut from any structures, pavements and footpaths would also be required.*

Where required, engineered retention systems such as reinforced concrete block walls or mass gravity walls (i.e. gabion baskets, concrete blocks, Gabi blocks, etc.) could be adopted at the site to support both temporary and permanent excavations.

Retention structures may be designed based on the parameters presented in Table 4. All earth retention structures must consider any permanent or temporary surcharges within the super-structure or behind retention structures (such as traffic loading, construction loading, temporary stockpiles, piezometric levels, etc.).

Table 4: Earth Retention Design Parameters

Material	Unit Weight, γ	Friction Angle, Φ'	Effective Cohesion, c'	Active Earth Pressure Coefficient, k_a	At Rest Earth Pressure Coefficient, k_o	Passive Earth Pressure Coefficient, k_p
Level 1 Controlled Fill (won from onsite)	20 kN/m^3	30°	5kPa	0.33	1.05	3.00
Residual Soil	20 kN/m^3	26°	5kPa	0.40	0.90	2.55
Weathered Siltstone	22 kN/m^3	30°	5kPa	0.33	1.05	3.00

The earth pressure coefficients detailed in Table 4 have been calculated using Rankine's Theory assuming level backfill. The retaining wall designer should ensure that the use of this method is appropriate for the individual retaining wall.

For freestanding retaining wall backfill should comprise free draining granular material. Drainage behind the wall should comprise a geocomposite drain or geotextile wrapped gravel drain at the back of the wall that drains to a geotextile wrapped subsoil drain along the wall toe. The toe drain should discharge to the site storm water system to provide long term drainage behind retaining walls.

5.3 Reuse of Site Materials

The existing topsoil at the site is not suitable for reuse as controlled fill and will be suitable for landscaping purposes only.

The residual clay is considered suitable for reuse as controlled fill at the site, however, the material is moderately reactive (shrink-swell index of 1.6%) and has a low CBR (5%). It is therefore recommended that the residual clay be blended with weathered siltstone and that the upper 0.5m of the fill profile beneath any proposed pavements or 1m below structures should comprise weathered siltstone materials.

Where higher strength and less fractured rock is encountered care must be taken to ensure the material has a maximum particle size of 100mm before reuse as engineering fill. This may require screening or mechanical breakdown of cobbles and boulders.

If site soils are to be disposed of offsite then further detailed assessment would be required. Based on site observations the residual clay and weathered mudstone will likely meet the requirements for Virgin Excavated Natural Material (VENM).

5.4 Stripping, Fill Placement & Compaction Control

The following general comments and recommendations are provided regarding subgrade preparation, fill placement and compaction control:

- All root affected material, uncontrolled fill and topsoil should be fully stripped and stockpiled for later reuse for landscaping purposes over the site. These materials are not considered suitable for reuse as engineered fill;
- Following stripping to an appropriate foundation level below fill areas, the exposed subgrade materials should be proof rolled to identify any wet, excessively deflecting or other deleterious material. Any such areas should be over-excavated down to a stiff base and backfilled with a clean select material. Any such areas are likely to be isolated;
- Where weathered rock is present at subgrade level, it is recommended that it be ripped to 300mm and re-compacted to break up preferential drainage paths and facilitate service trench construction;
- Controlled fill should be placed in layers not exceeding 250mm loose thickness. Fill below structures and pavement areas should be compacted to a minimum dry density ratio of not less than 98% Standard. The upper 300mm below pavements should be compacted to a minimum density ratio of 100% standard compaction;
- Fill should be placed and maintained at ±2% of Standard OMC;
- Where footings are to be founded within fill (i.e. within the proposed industrial lots) it must be undertaken in accordance with Level 1 construction monitoring and testing as defined in AS3798 – 2007 '*Guidelines on earthworks for residential and commercial developments*'. The Level 1 fill must extend beyond the footprint of the proposed buildings at a projected vertical angle of 45° to ensure that the Level 1 fill extends to at least the zone of influence of the footings; and
- Filling below pavements or in areas of individual lots where structures are not proposed should be carried out in accordance with Level 2 construction monitoring and testing as defined in AS3798 – 2007.

6 FOUNDATIONS

6.1 Preliminary Site Classification

AS2870-2011, '*Residential Slabs and Footings*', sets out criteria for the classification of a site and the design and construction of a footing system for a single dwelling house, townhouse or similar structure. The site classification presented herein is provided on the basis that the performance expectations of AS2870-2011 are acceptable for the proposed structure.

The preliminary site classification presented herein is based on the following:

- Depth of design suction change of H_s=2.3m;
- Crack depth multiplication factor of 0.5;
- Change in suction at design surface level of Δ_U=1.2;
- Shrink-swell index of 1.6% for the residual clay that extends to 0.5m and 0.5% for the extremely weathered siltstone; and
- Trees are not located at closer than half the mature height of the tree from proposed structures.

Based on the above, the site is classified as Class 'S' (slightly reactive) with a characteristic surface movement of up y_s = 20mm when assessed in accordance with AS2870-2011.

If cuts up to 1m deep or up to 1m of site won residual clay fill is placed at the site under Level 1 conditions as outlined in Section 5.4 then the site would be able to be reclassified as Class 'M' (moderately reactive) with a characteristic surface movement of y_s = 35mm.

Changes to the soil moisture regime resulting from leaking services or the effects of tree roots can affect foundation movement. Appropriate site drainage must be maintained during and post construction and it is recommended that tree removal be undertaken as soon as possible to allow the soil moisture profile to reach equilibrium prior to construction.

Shrink-swell related movements can be affected by alterations to the soil profile by cutting and filling, and by the suction related effects of trees close to the building area. The effects of any such cutting, filling or tree planting should be considered when selecting design values for differential movement across the slab.

6.2 Foundation Options & Design Parameters

Structures at the site are anticipated to comprise single storey commercial buildings and associated infrastructure. Shallow foundations such as pad/strip footings, raft slabs or shallow bored piles are considered suitable options and may be design based on the design parameters presented in Table 5.

Table 5: Shallow Foundation Design Parameters

Founding Material	Allowable Base Bearing Capacity (kPa)
Level 1 Controlled Fill	100kPa
Residual Soil	150kPa
Extremely Weathered Siltstone	150kPa
Distinctly weathered Siltstone	400kPa

It is typically recommended that all footings for an individual structure be founded on similar materials. All footings, edge beams and internal beams should be founded outside or below the zones of influence resulting from existing or future service trenches, retaining walls or other subsurface structures.

Prior to the placement of concrete, we recommend that footings be observed and assessed by a suitably experienced Geotechnical Engineer to assess that the correct founding material has been achieved.

Footings should be constructed as soon as practical upon reaching the founding depth and the foundations should not be left exposed and allowed to become wet and soften. If construction is delayed, the base of the foundation excavations should be blinded to prevent softening of soils and to provide a working platform for construction of the footings.

7 PAVEMENT CONSTRUCTION

The following general construction advice is given:

- Table drains should be constructed or maintained on both sides of the road that extend to at least the full depth of the pavement and pavement layers should extend to the edges of formation to allow lateral drainage. Where pavement geometry and surrounding ground does not allow the construction of a table drain, a sump should be provided at the outer edge of the shoulder, with geofabric wrapped subsoil drain installed, draining along the edge of the pavement to discharge to a culvert or other suitable outlet;
- A geotechnical assessment of the site should be undertaken following boxing out of pavement areas to assess the need for additional, or deeper, subsoil drains due to potential for isolated seepages to occur in the weathered rock profile in the areas of cut;
- Once the exposed subgrade has passed proof roll, unless distinctly weathered siltstone is exposed do not rip and recompact. Reworking may result in the subgrade having a higher moisture content that the surrounding soils which may result in shrinkage cracks propagating through the pavement seal during extended periods of low rainfall. Distinctly weathered siltstone should be ripped and reworked prior to construction of the pavement;
- Select Fill and pavement gravels should be placed and maintained at 60% to 90% of Optimum Moisture Content;
- Should wet weather occur prior to final sealing, the base course should be allowed to dry back to not more than 90% of Optimum Moisture Content prior to sealing. Trapping of excess moisture below the final seal will significantly reduce pavement life.

8 LIMITATIONS

The assessment presented herein was undertaken based on site information provided by East West. It has been assumed that the information provided is a true and accurate representation of site conditions.

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual

state of the site at all points. If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

Simon Keen

Senior Geotechnical Engineer

Reviewed by

Adam Holzhauser

Associate Geotechnical Engineer

Figures


TP 5
TP 3
TP 4
TP 1
TP 2

Appendix A

Results of Field Investigations

TESTPIT LOG

TESTPIT NO.: TP 1

CLIENT: Regional Geotechnical Solutions
PROJECT: Geotechnical Investigation
LOCATION: 284 Gidley Appleby Lane, Tamworth

JOB NO.: EW195175

CO-ORDINATES: ,
ELEVATION:
RIG: **DRILL BIT:**

START DATE: 17/06/2019
END DATE: 17/06/2019
LOGGER: S.M.

USCS	DESCRIPTION	GRAPHIC	DEPTH	DCP BLOWS (5 10 15)	IN-SITU TESTS	SAMPLE
	Silt, Topsoil	TS T TS				
	Shale, Extremely Weathered		0.5			
	Shale, Distinctly Weathered		1.0			
	BUCKET REFUSAL AT 1.3m		1.5			
			EOH: 1.60m			

REMARKS

TESTPIT LOG

TESTPIT NO.: TP 2

CLIENT: Regional Geotechnical Solutions
PROJECT: Geotechnical Investigation
LOCATION: 284 Gidley Appleby Lane, Tamworth

JOB NO.: EW195175

CO-ORDINATES: ,
ELEVATION:
RIG: **DRILL BIT:**

START DATE: 17/06/2019
END DATE: 17/06/2019
LOGGER: S.M.

USCS	DESCRIPTION	GRAPHIC	DEPTH	DCP BLOWS (5 10 15)	IN-SITU TESTS	SAMPLE
	Topsoil	TS T				
	??		0.5			0.50 - 0.80m, Small disturbed sample
	Shale, Extremely Weathered		1.0			
	Shale, Distinctly Weathered		1.5			
	BUCKET REFUSAL AT 1.4m		EOH: 1.80m			

REMARKS

TESTPIT LOG

TESTPIT NO.: TP 3

CLIENT: Regional Geotechnical Solutions
PROJECT: Geotechnical Investigation
LOCATION: 284 Gidley Appleby Lane, Tamworth

JOB NO.: EW195175

CO-ORDINATES: ,
ELEVATION:
RIG: **DRILL BIT:**

START DATE: 17/06/2019
END DATE: 17/06/2019
LOGGER: S.M.

USCS	DESCRIPTION	GRAPHIC	DEPTH	DCP BLOWS (5 10 15)	IN-SITU TESTS	SAMPLE
	Topsoil	TS				
	Gravelly CLAY, Medium Plasticity, Brown, MC < WP					
	Shale, Completely Weathered, Soil Properties		0.5			0.40 - 0.70m, Bulk disturbed sample
	Shale, Distinctly Weathered		1.0			
	BUCKET REFUSAL AT 1.4m		1.5			
			EOH: 1.80m			

REMARKS

TESTPIT LOG

TESTPIT NO.: TP 4

CLIENT: Regional Geotechnical Solutions
PROJECT: Geotechnical Investigation
LOCATION: 284 Gidley Appleby Lane, Tamworth

JOB NO.: EW195175

CO-ORDINATES: ,
ELEVATION:
RIG: **DRILL BIT:**

START DATE: 17/06/2019
END DATE: 17/06/2019
LOGGER: S.M.

USCS	DESCRIPTION	GRAPHIC	DEPTH	DCP BLOWS (5 10 15)	IN-SITU TESTS	SAMPLE
	Topsoil	TS T				0.10 - 0.35m, Small disturbed sample
	Gravelly CLAY, Medium Plasticity, Brown, MC < WP					
	Shale, Extremely Weathered		0.5			
	Shale, Distinctly Weathered		1.0			
	BUCKET REFUSAL AT 1.1m		1.5			
			EOH: 1.60m			

REMARKS

TESTPIT LOG

TESTPIT NO.: TP 5

CLIENT: Regional Geotechnical Solutions
PROJECT: Geotechnical Investigation
LOCATION: 284 Gidley Appleby Lane, Tamworth

JOB NO.: EW195175

CO-ORDINATES: ,
ELEVATION:
RIG: **DRILL BIT:**

START DATE: 17/06/2019
END DATE: 17/06/2019
LOGGER: S.M.

USCS	DESCRIPTION	GRAPHIC	DEPTH	DCP BLOWS (5, 10, 15)	IN-SITU TESTS	SAMPLE
	Topsoil	TS T TS T				0.15 - 0.50m, Bulk disturbed sample
CH	CLAY, High Plasticity, Dark Brown, MC = WP					
	Shale, Distinctly Weathered		0.5			
	BUCKEY REFUSAL AT 0.6m		1.0			
			EOH: 1.20m			

REMARKS

Appendix B

Laboratory Test Result Sheets

East West Enviroag Pty Limited
82 Plain Street Tamworth NSW 2340
ABN 82 125 442 382 124 ph 02 6762 1733 fax 02 6765 9109

eastwest
geo ag enviro

CALIFORNIA BEARING RATIO REPORT SHEET

CLIENT:	Regional Geotechnical Solutions		
CLIENT ADDRESS:	Unit 14, 25-27 Hurley Drive, Coffs Harbour NSW 2450	**REPORT NO:**	EW195175-1
PROJECT:	Geotechnical Investigation	**PROJECT NO:**	EW195175
SITE LOCATION:	284 Gidley Appleby Lane - Tamworth		
DATE OF TESTING:	1/07/2019	**DATE OF REPORT:**	2/07/2019
TECHNICIAN:	M.C.	**DATE SAMPLED:**	17/06/2019

SAMPLE DATA

Test Location	TP 3
Depth	0.4 - 0.7m
Material Description	Gravelly CLAY

Sample Number	2
Sampling Clause	AS1289.1.2.1.6.5.4

LABORATORY COMPACTION DATA

Australian Standards

- ☑ AS1289.5.1.1 - Standard Compction
- ☐ AS1289.5.2.1 - Modified Compaction
- ☑ AS1289.2.1.1 - Moisture Content - Oven

RTA Methods

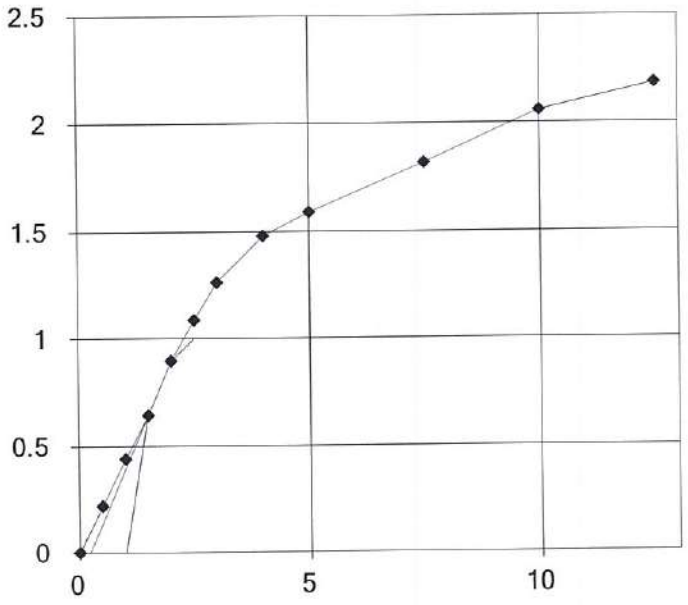
- ☐ RMS T111 - Standard Compaction
- ☐ RMS T112 - Modified Compaction
- ☐ RMS T120 - Moisture Content - Oven

Maximum Dry Density	t/m³	1.86
Optimum Moisture Content	%	15.7
Field Moisture Content	%	11.2

CALIFORNIA BEARING RATIO TEST RESULTS

☑ AS1289.6.1.1 ☐ RMS T117

Dry Density (At Compaction)	t/m³	1.86
Density Ratio (At Compaction)	%	100
Moisture Content (At Compaction)	%	15.8
Moisture Ratio (At Compaction)	%	101
Days Soaked		4
Surcharge Weight	kg	4.5
Swell (After soaking)	%	0.2
Dry Density (After soaking)	t/m³	1.86
Moisture Content (Top 30mm)	%	17.7
Moisture Content (Remaining Sample	%	16.4
CBR Value @ 2.5mm Penetration	%	**8**
Percentage of sample retained on 19mm Sieve		0



Sampled By: East West Enviroag

Tested By: EW - Tamworth

Comments:

Signed: _____ Approved Signatory

Signatory Name: S Mitchell
Document ID: REP-119
Issue No: 3
Date of Issue: 12-Jan-15

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

East West Enviroag Pty Limited
82 Plain Street Tamworth NSW 2340
ABN 82 125 442 382 124 ph 02 6762 1733 fax 02 6765 9109

eastwest
geo ag enviro

CALIFORNIA BEARING RATIO REPORT SHEET

CLIENT:	Regional Geotechnical Solutions		
CLIENT ADDRESS:	Unit 14, 25-27 Hurley Drive, Coffs Harbour NSW 2450	**REPORT NO:**	EW195175-2
PROJECT:	Geotechnical Investigation	**PROJECT NO:**	EW195175
SITE LOCATION:	284 Gidley Appleby Lane - Tamworth		
DATE OF TESTING:	1/07/2019	**DATE OF REPORT:**	2/07/2019
TECHNICIAN:	M.C.	**DATE SAMPLED:**	17/06/2019

SAMPLE DATA

Test Location	TP 5
Depth	0.15 - 0.5m
Material Description	CLAY

Sample Number	4
Sampling Clause	AS1289.1.2.1.6.5.4

LABORATORY COMPACTION DATA

Australian Standards

- ☑ AS1289.5.1.1 - Standard Compction
- ☐ AS1289.5.2.1 - Modified Compaction
- ☑ AS1289.2.1.1 - Moisture Content - Oven

RTA Methods

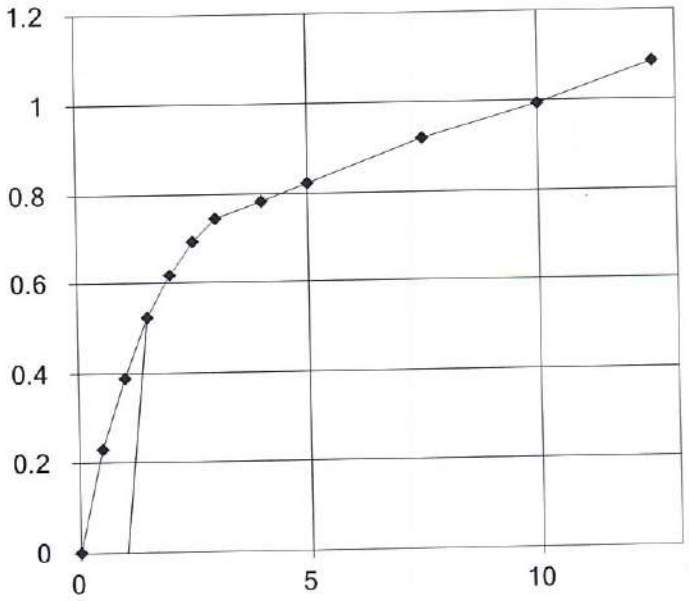
- ☐ RMS T111 - Standard Compaction
- ☐ RMS T112 - Modified Compaction
- ☐ RMS T120 - Moisture Content - Oven

Maximum Dry Density	t/m³	1.58
Optimum Moisture Content	%	24.2
Field Moisture Content	%	22.3

CALIFORNIA BEARING RATIO TEST RESULTS

☑ AS1289.6.1.1 ☐ RMS T117

Dry Density (At Compaction)	t/m³	1.58
Density Ratio (At Compaction)	%	100
Moisture Content (At Compaction)	%	24.2
Moisture Ratio (At Compaction)	%	100
Days Soaked		4
Surcharge Weight	kg	4.5
Swell (After soaking)	%	2.2
Dry Density (After soaking)	t/m³	1.55
Moisture Content (Top 30mm)	%	26.2
Moisture Content (Remaining Sample	%	24.4
CBR Value @ 2.5mm Penetration	%	**5**
Percentage of sample retained on 19mm Sieve		0



Sampled By: East West Enviroag

Tested By: EW - Tamworth

Comments:

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Signed:
Approved Signatory

Signatory Name: S Mitchell
Document ID: REP-119
Issue No: 3
Date of Issue: 12-Jan-15

East West Enviroag Pty Limited
82 Plain Street Tamworth NSW 2340
ABN 82 125 442 382 124 ph 02 6762 1733 fax 02 6765 9109

SHRINK SWELL TEST REPORT

Australian Standard 1289.7.1.1

CLIENT:	Regional Geotechnical Solutions		
CLIENT ADDRESS:	Unit 14, 25-27 Hurley Drive, Coffs Harbour NSW 2450	**REPORT NO:**	EW195175-3
PROJECT:	Geotechnical Investigation	**PROJECT NO:**	EW195175
SITE LOCATION:	284 Gidley Appleby Lane - Tamworth		
DATE OF TESTING:	27/06/2019	**DATE OF REPORT:**	2/07/2019
TECHNICIAN:	M.C.	**DATE SAMPLED:**	17/06/2019
Sampled By :	East West Enviroag		
Sampling Method:	☐ AS1289.1.2.1.6.4 b ☐ AS12891.2.1.6.5.1 ☐ AS1289.1.2.1.6.5.3 ☑ AS1289.1.2.6.5.4		

Sample Number:		1	3	
Sample Location:		TP 2	TP 4	
Sample Description:		Clayey Gravel / Gravelly CLAY	Gravelly CLAY	
Depth		0.5 - 0.8m	0.1 - 0.35m	
Test Result				
Shrink Specimen Moisture Content	%	20.6	18.2	
Swell Specimen Moisture Content Before and After	%	20.2 / 24.8	17.1 / 18.7	
Maximum Swell (Esw)	%	0.71	0	
Maximum Shrink (Esh)	%	2.6	2.92	
Shrink Swell Index (Iss)	%	1.6	1.6	
Cracking:		Slightly Cracked	Slightly Cracked	
Crumbling:		Nil	Nil	
Inert Inclusions:	%	50%	Nil	
Sample By:		S.M.	S.M.	

Remarks: Sample 1 had 5.7% moisture added and Sample 3 had 6.7% moisture added were remoulded prior to testing.

Signed: _____
Approved Signatory

Signatory Name: S Mitchell
Document ID: REP-117
Issue No: 2
Date of Issue: 24-Apr-13

East West Enviroag Pty Limited
82 Plain Street Tamworth NSW 2340
eastwest ABN 82 125 442 382 124 ph 02 6762 1733 fax 02 6765 9109
geo ag enviro

SOIL CLASSIFICATION TEST REPORT

AUSTRALIAN STANDARDS METHODS

CLIENT:	Regional Geotechnical Solutions		
CLIENT ADDRESS:	Unit 14, 25-27 Hurley Drive, Coffs Harbour NSW 2450	**REPORT NO:**	EW195175-4
PROJECT:	Geotechnical Investigation	**PROJECT NO:**	EW195175
SITE LOCATION:	284 Gidley Appleby Lane - Tamworth		
DATE OF TESTING:	27/06/2019	**DATE OF REPORT:**	2/07/2019
TECHNICIAN:	M.C.	**DATE SAMPLED:**	17/06/2019
Sampled By :	East West Enviroag		

	SAMPLE No:	1	3	
	SAMPLE LOCATION:	TP 2 (0.5-0.8m)	TP 4 (0.1-0.35m)	
	MATERIAL DESCRIPTION:	Clayey Gravel/Gravelly CLAY	Gravelly CLAY	
	WASHED/UNWASHED			
AS1289.3.8.1	Water Type & Temperature:			
TEST METHOD	TEST DESCRIPTION			
~~AS1289.3.6.1~~	75.0mm			
	63.0mm			
	53.0mm			
	37.5mm			
	26.5mm			
	19.0mm			
	13.2mm			
SAMPLING METHOD	% Passing Sieve Analysis 9.5mm			
	6.7mm			
	4.75mm			
~~AS1289.1.2.1.6.4~~	2.36mm			
~~AS1289.1.2.1.6.5.1~~	1.18mm			
~~AS1289.1.2.1.6.5.3~~	600µm			
AS1289.1.2.1.6.5.4	425µm			
	300µm			
	150µm			
	75µm			
AS1289.3.8.1	EMERSON CLASS NO:	5	5	
~~AS1289.2.1.1~~	MOISTURE CONTENT: %			
	CODE			
~~AS1289.3.1.1~~	LIQUID LIMIT %			
~~AS1289.3.1.2~~	LIQUID LIMIT %			
~~AS1289.3.2.1~~	PLASTIC LIMIT %			
~~AS1289.3.3.1~~	PLASTICITY INDEX %			
~~AS1289.3.4.1~~	LINEAR SHRINKAGE %			

CODES USED

Sample history for plasticity tests	
Air Dried	1
Low temperature oven (<50°) dried	2
Other/Unknown	3

Method of preparation for plasticity tests	
Dry sieved	4
Wet sieved	5
Natural	6

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Signed: .....
Approved Signatory

Signatory Name: S Mitchell
Document ID: REP-102
Issue No: 2
Date of Issue: 24-Apr-13

Bushfire Assessment

Appendix K

pitt&sherry

Tamworth Organics Recycling Facility (TORF)
Bushfire Management Plan
2019—2024

Bushfire Risk Summary

Property	• Tamworth Regional Council (TRC) proposes to construct and operate a Closed Tunnel Organic Recycling Facility on 284 Gidley Appleby Road, Gidley. The site accepts food organics and garden organics, timber, paunch, highly putrescible waste and liquid waste to be recycled into composted soil and composted mulch for off-site market sale. • Located 20 km north-west of Tamworth town centre and 15 km north-west of the Tamworth Regional Airport. See Figure 1. • Tamworth Regional Council administered land to be leased to a contractor (herein referred to as 'Facility Operator').
Area description	The surrounding area consists mainly of grazed rural holdings and pastoral companies with the Peel River located to the east.
Bushfire Prone Area	The subject land is not mapped as Bush Fire Prone however Bush Fire Prone Land mapping is intended to be a planning trigger rather than definitive mapping. Potentially, the subject land is susceptible to bushfire attack based on: • The site has potential to create bushfire risk from internal ignition sources i.e. operational activities—compost, hot works. • Grassland vegetation within and surrounding the site has the potential to sustain a bushfire or contribute to bushfire attack. • Weather conditions supporting bushfires of damaging potential occur annually. 'Elevated fire danger conditions' are considered to occur when FDI ≥ 80 (i.e. Severe Fire Danger Rating).
Bushfire Season	Bushfire risk in the region is greatest from October through to March for the majority of the District. Prevailing weather conditions associated with the bushfire season in the Tamworth BFMC are usually north-westerly winds accompanied by high daytime temperatures and low relative humidity. There are also frequent dry lightning storms occurring throughout the area during the bushfire season.
Summary of Bushfire Risk Factors	• **Risk:** Grassland areas within the subject land and unmanaged grassland areas adjoining the subject land are capable of supporting fire. On-site composting material capable of ignition. The following justifies these risk rankings: ◊ Ensure safety of life and property—within the subject land and surrounding land. • **Objective:** The objectives of bushfire management and mitigation on TORF are: *a. protect human life;* *b. protect assets; and* *c. minimise the physical and environmental impact of bushfires.* • **Strategies:** Entire site to be managed to Asset Protection Zone (APZ) standard or to a minimum fuel load, intensively fuel reduced areas reduces the risk from potential ignition points. Raising knowledge and understanding of bushfire risks and management within personnel, contactors and stakeholders. Good relations with local fire agencies. • **Risk Control Measures:** Fuel management and building maintenance within the site. Incident response preparedness, water supplies and ignition risk management etc. Site users aware of bushfire risk, preparedness, response and evacuation requirements.

Contacts

Reporting and Alert Procedures

Upon report of a fire:

Notify **NSW Fire & Rescue (F&R) and/or NSW Rural Fire Service (RFS)** on **000** with details on fire and current conditions.

Notify all contractors onsite

Notify NSW Environmental Protection Agency (EPA) on 131 555

Notify adjoining property owners:

348 Gidley- Appleby Road, Gidley

306 Gidley- Appleby Road, Gidley

279 Gidley- Appleby Road, Gidley

315 Gidley- Appleby Road, Gidley

Gidley- Appleby Road, Gidley (poultry farm which is owned by 'Proten Tamworth Limited')

87 Wallamore Road, Gidley.

Site manager to initiate first response requirement if safe to do so, with personnel to wait for NSW F&R or NSW RFS to arrive at gate, escorting them to location of fire (if required)

NSW F&R and/or NSW RFS to control and mop-up and notify when fire is out.

Initiate debrief and post-fire monitoring procedures

Access / Procedures

Main Entry: Entrance off Gidley-Appleby Lane (Figure 1)

Additional Entry Points: None.

Fire Fighting Hazards

- Storage of fuels/flammable liquids—10,000L diesel fuel cube adjacent to the equipment shed (Refer Figure 1)
- Traffic—trucks and machinery operating on site that may restrict fire appliances

Constraints & Restrictions

Only one access road to and from the site from Gidley-Appleby Road.

Document Authorisation

Authorised by: Jessica Berry	**September 2019**

Bushfire Warnings

Bushfire Warning	Information Type	Action required
Advice	*Provides information on where the fire is plus related general information. No immediate danger.*	Facility Operator of the site to assess whether staff, clients and contractors should evacuate the site or remain on site and communicate accordingly. All site users to communicate via radio
Watch and Act	*A fire is approaching. There is a threat to life and property. Take action to protect yourself and others.*	Facility Operator should contact all site users (staff, clients and contractors) and advise them to evacuate the site (according to evacuation procedures for TORF).
Emergency Warning	*The highest level of alert. You are in immediate danger and need to take immediate action.*	If it has not yet occurred, Facility Operator should contact all site users (staff, clients and contractors) and advise them to evacuate the site (according to evacuation procedures for TORF) or seek refuge. Any directions of the Emergency Services Authority should be followed.

Emergency Refuges of Last Resort

To facilitate quick and safe access for bushfire brigades, public access to the site is to ceased immediately upon detection or notification of a bushfire. The weighbridge for TORF is to close if the fire occurs on site

On notification of a bushfire, weighbridge is to immediately notify all staff, contractors, and customers operating within the site. The transfer of these people to refuge areas is to occur when it is safe to do so, i.e. the fire is not running between the people and exit and refuge points.

The maintenance of the clear tracks is essential to facilitate evacuation. Depending on the location of the bushfire and prevailing winds, suitable refuge areas are:

» The weighbridge area of TORF

» The junction of Gidley-Appleby Road and Wallamore Road.

Tamworth Organics Recycling Facility – Bushfire Response Plan

Fire Detected
Call 000

Notify
NSW State Emergency Services (SES)

1. NSW F&R or NSW RFS to provide suppression activities until fire is declared as being contained
2. NSW F&R or NSW RFS will coordinate provision of IC

Provide information on:

1. Location of fire, GPS reference (available from most smart phones), nearest access road/trail
2. Fire behaviour: size, rate of spread, flame height
3. Description of terrain and landscape
4. Any assets under threat
5. Nearest waterpoint

Notify
NSW Environment Protection Agency (EPA) hotline

Provide information on:

1. Time, date, duration of event, area of impact, fire contained, remediation proposed .

If staff/public on site:

1. Stop entry to site
2. Commence suppression activity, if safe to do so
3. Clear access to fire location for emergency services
4. If fire is uncontained, retreat to emergency evacuation area

If fire able to be extinguished:

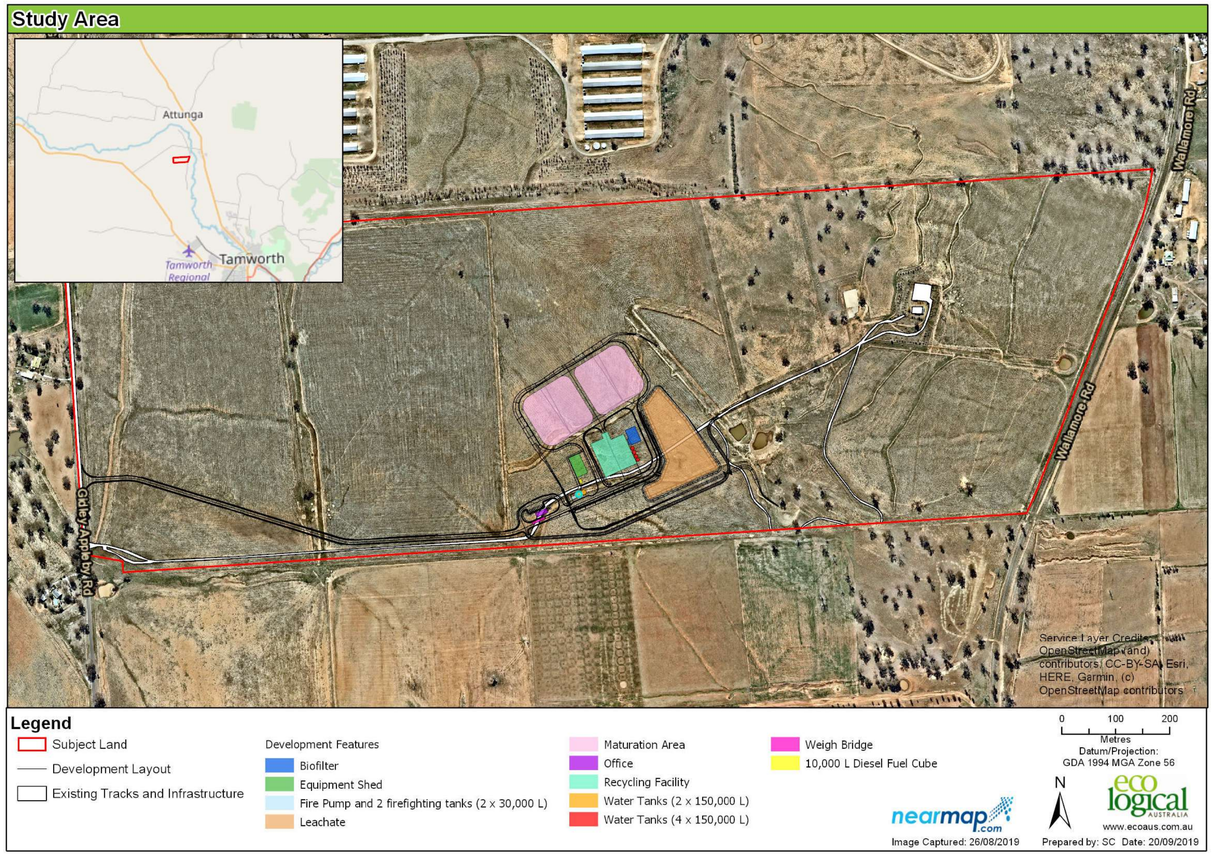
1. Report status to NSW F&R or NSW RFS
2. Resume activities, if safe to do so

Fire deemed as "Out" and "Safe"

Post fire monitoring / reporting

1. Once fire is contained, inform Facility Operator
2. Facility Operator to initiate post-fire reporting procedure (extent of fire, intensity, area affected, suppression activity required including number of appliances and personnel).
3. Facility Operator to provide reporting to NSW F&R or NSW RFS.
4. Facility Operator to provide reporting to NSW EPA—Armidale North Branch

Figure 1



Fire Suppression Resources

Response Task	Resources	Response Time	Notes
Initial attack	• Onsite – Fire extinguishers, water cart and fire hoses on TORF • Onsite – TORF staff resources variable (machinery) • Offsite – NSW F&R / RFS	• Onsite – dependent upon fire location and nearby static resources • Offsite – NSW F&R / RFS approximately 30 to 45 min	
Sustained suppression	• Offsite - NSW F&R / RFS	• Offsite – NSW F&R / RFS approximately 30 min • Resources dependent upon current risk, bushfire activity and prioritisation of assets under threat	• Assisted by TORF (machinery)
Mop up & patrol	• Offsite - NSW F&R / RFS	• As above	• As above
Logistical Support	• Fire control operations and briefings	• Various areas available onsite dependent upon current risk and bushfire activity	• NSW RFS located in Tamworth
	• Staging area for equipment entering / leaving site	• Various areas available onsite dependent upon current risk and bushfire activity	
	• Aircraft	• Response time varies • Resources dependent upon current risk, bushfire activity and prioritisation of assets under threat	• Aerial suppression resources to be authorised by NSW F&R or NSW RFS
	• Fire suppression bushfire chemicals		• Foaming agents (Class A Foam / BFFF) is permitted • Avoid BFFF use near wetlands, water courses, dams
	• Earth moving equipment	• Response time varies • Resources can depend upon current risk, bushfire activity and prioritisation of assets under threat	• A fire fighting vehicle must accompany earthmoving equipment in a wildfire
	• First aid facilities	• Onsite—TORF	
	• Catering options	• Nil onsite	• Tamworth town centre approximately 20 km (20 minute drive) south-east.

Preparedness

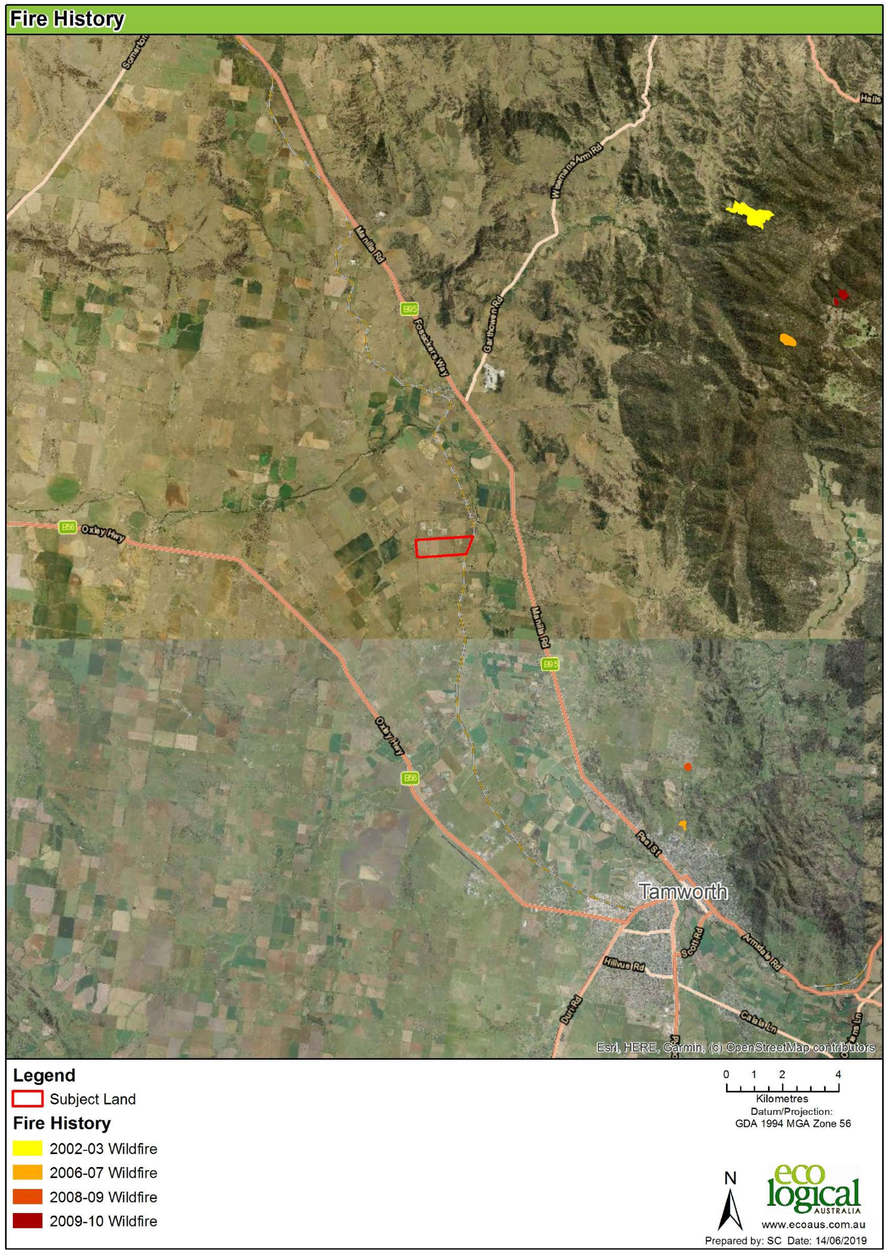
Fire Danger Rating	Fire Danger Index	Potential fire behaviour and impact	Restrictions	General preparedness
Low / Moderate	0 to 11	Fires can be easily controlled and are slow moving with low flame heights.	None	Ensure that occupants and wardens are aware of the Emergency procedures for the facility
High	12 to 24	Fires can be controlled but can still present a threat. Embers may be blown ahead of the fire and into and around buildings causing other fires to occur close to the main fire.	None	Ensure that all vegetation surrounding assets are fully managed.
Very High	25 to 49	Bushfire difficult to control and may be fast moving. Damage to assets will occur without suppression action. Expect embers to be occur up to 2 km ahead of the main fire.	None	Restrict site access
Severe	50 to 74	Bushfires unpredictable, fast moving and difficult to control. Flames may reach the tops of trees. Spot fires and heavy ember attack, with embers up to 4 km ahead of the fire. Damage to assets probable. Life and injury risks high.	None	Restrict site access
Extreme	75 to 99	Fires will be uncontrollable, unpredictable and fast moving with flames in the tree tops. Spot fires and heavy ember attack, with embers up to 6 km ahead of the fire. Damage to assets probable. Life and injury risks high.	None	Limit access to site Ensure all people on site are aware of evacuation procedures and radio channel for communication
Catastrophic	100+	Bushfires unpredictable, very fast moving and uncontrollable. Spot fires and ember attack is extreme. And could be up to 20 km ahead of the main fire. Damage to assets probable. Life and injury risks very high.	None	Limit access to site Ensure all people on site are aware of evacuation procedures and radio channel for communication

All sources of ignition are prohibited on declaration of Total Fire Ban.

Command and Control

Activity	Operational Guidelines
Fire Command and Incident Control (IC)	AIIMS is the command and control structure to be utilised. NSW F&R or NSW RFS will be the incident controller for all fires. The control of a fire on the site is, at the time of ignition, the responsibility of the relevant Facility Operator. The Command of the fire units and vehicles, and personnel is the responsibility of the senior brigade officer on duty. Upon the arrival of a local fire brigade, the control of the fire should be handed to the most senior officer of the brigade and a command liaison initiated between the Incident Controller and the Facility Operator/site manager.
Control Point, Operations Point & Incident Control Centre (ICC)	The control point for a fire is at the TORF office, or from a vehicle on the fire ground if in rural holding.

Figure 2



Awareness

Awareness activity/ product	Detail	Timing / Position Responsible
Prepare, Act, Survive Plans	• Prepare, Act, Survive plan be integrated into relevant site operational policies or developed for sites (emergency, evacuation, induction). • Include actions for triggers on alerts Advice, Watch and Act, Emergency Warning • Link to preparedness and response strategy • Refer to NSW RFS documents (https://www.rfs.nsw.gov.au/plan-and-prepare)	Annual Update Facility Operator of TORF
New starter, visitor and contractor inductions	• Update induction process to include evacuation, reporting of fires, operational restrictions during higher FDRs, etc.	Annual Update Facility Operator of TORF
Annual briefings and bushfire preparedness	• Review annual Mitigation works program	Annually Facility Operator of TORF
	• Review annual Preparedness and Response program • Undertake annual fire drill	Annually Facility Operator of TORF
	• Pollution Incident Response Management Plan (PIRMP) tested annually • Hard copy PIRMP must be kept on-site in the office, weighbridge and Hazmat box • Regular site inspections undertaken to assess environmental compliance of site which includes Fire Safety Regulation	Annually Facility Operator of TORF and relevant TRC Staff member
Fire Danger Rating notifications and restrictions	• Activities restricted (if any) based on FDR • Remind site users and contractors of current FDR in fire season	Oct-Mar Facility Operator of TORF
Links with other plans and agencies	• Make annual contact with NSW F&R or NSW RFS • Review/consultant Operational Environmental Management Plan (OEMP) and provide briefing.	Annually before 30 September Post fire season if required Facility Operator of TORF
Media releases	• Issued as required regarding prescribed burning and progress with any wildfire suppression	As required NSW SES with approval from TRC

Bushfire Preparedness Checks Program

Work Type	Location	Standard	Timing	Procedures	Responsibility / Monitoring
Access maintenance	Figure 1	Free from all obstructions to a width of 4 m to allow the safe passage of tankers	August and September (annually)	• Inspect in August and any works completed by end of September (annually), and as required in Fire Danger Period	Responsible –TORF
Water Supply maintenance	Figure 1		Prior to Oct (annually)	• Inspect/maintain operability of all Static Water Supply (SWS) including water level, hydrants, valves and connections • Ensure signage is installed and visible • Clear vegetation around SWS (minimum of 6 m) for ease of access	Responsible –TORF
Suppression equipment maintenance	All	To a functional and working standard	Prior to Oct (annually), and as required in Fire Season	• Inspect, service and maintain all suppression equipment contained on TORF (fire hoses, pumps, fittings)	Responsible –TORF
General Maintenance	All buildings		Prior to Oct (annually), and as required in Fire Season	• Check and clear all leaf litter from gutters on all buildings.	Responsible –TORF

Hazard and Risk Report

Appendix L

pitt&sherry

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Risk and Hazard Assessment

Tamworth Organic Recycling Facility

Prepared for

Tamworth Regional Council

Client representative

Megan Mather

Date

30 August 2019

Rev00

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List of figures

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Appendices

Prepared by — Eleanor Parry

Date —10/09/2019

Reviewed by — Jessica Berry		**Date — 30/08/2019**
Authorised by — Jessica Berry		**Date — 30/08/2019**

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft for internal review	EP	JB	JB	30/08/2019
00	Draft for client	EP	JB	JB	30/08/2019

Executive Summary

A hazard and risk assessment was undertaken by pitt&sherry for the proposed Organic Recycling Facility at 284 Gidley Appleby Road located approximately 15km north west of Tamworth City (the “Proposal”).

In accordance with the Secretary’s Environmental Assessment Requirements issued by Department of Planning, and Environment a preliminary risk screening in accordance with State Environmental Planning Policy 33 (SEPP 33) and Applying SEPP 33 has been undertaken. A development is considered potentially hazardous and requires a Preliminary Hazard Analysis (PHA) if the storage or transport of hazardous materials exceeds specific screening thresholds outlined in SEPP 33. As per the findings of the screening, the quantities of dangerous goods proposed to be stored on-site are well below the screening thresholds and do not trigger the requirement for a Preliminary Hazard Assessment (PHA).

A risk assessment was prepared for the Proposal, which considered normal operations, abnormalities in the operations, natural disasters or impacts, and external intervention such as terrorism, vandalism or residential encroachment. Further assessment of the risks and hazards associated with the production and storage of leachate, biosecurity risks, bird strike and operational fire were undertaken.

During the operation of the facility, controls in place as proposed such as the design elements considered, would assist in the management of hazards identified in this report. It has been assessed that most of hazards carry low risk and can be controlled by employing standard operating procedures and normal due diligence expected in a waste management facility. Recommendations to reduce construction risks include implementing the recommended mitigation measures including preparing a Waste Management Plan and Fire Management Strategy.

1. Introduction

pitt&sherry has been engaged by Tamworth Regional Council (TRC) to prepare an Environmental Impact Statement (EIS) for the proposed Organic Recycling Facility (ORF) at 284 Gidley Appleby Road located approximately 15km north west of Tamworth City (the "Proposal").

In accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by Department of Planning, and Environment (now Department of Planning, Infrastructure and Planning) a preliminary risk screening as per State Environmental Planning Policy 33 (SEPP 33) has been undertaken and included in this report.

Additionally, a preliminary risk assessment on hazards associated with the construction and operation of the ORF has been detailed. A review of an existing risk assessment performed on a similar facility was used to as a foundation to identify potential risk and hazards for the Proposal. The keys risks and hazards identified where:

- Contamination from leachate;
- Biosecurity breach through spread of pests, diseases, weeds and contaminants;
- Aircraft bird strike resulting from birds being attracted to the proposed facility; and
- Operational fire.

1.1 Project description

The proposed facility will accept Food Organics (FO), Garden Organics (GO) and Category 3 Organics, which will be processed to produce various soil amendments suitable for use in landscaping and agricultural production. Category 3 organic materials include meat, fish and fatty foods, fatty and oily sludges and organics of animal and vegetable origin. The proposed facility will utilise an enclosed Tunnel Composting System to process the batched organic materials.

The proposed facility would commence by processing approximately 35,000 tpa of FOGO and Category 3 organic materials from the Tamworth Local Government Area (LGA) that are currently landfilled at the TRC Forest Road Waste Management Facility (FRWMF). It is estimated the facility will then expand over the following years to process more tonnes of FOGO, however this will be part of a separate assessment later in the lifetime of the ORF. The facility will be designed with a total capacity of 35,000 tpa. This design capacity is likely to be utilised in the short term by the large (and rapidly growing) intensive poultry industry located in the Tamworth LGA.

Source separated organic materials will be derived from:

- A kerbside organics collection system in the Tamworth LGA for domestic food and garden organic collections;
- Domestic sourced drop-off garden organics (these will be received from FRWMF Transfer Station);
- Commercial drop-off garden organics;
- Uncontaminated wood products;
- Paunch; and
- Offal from nearby poultry processing facilities.

The proposed facility is a "composting facilities or works that process more than 5,000 tonnes per year of organic materials" and therefore meets the definition of a Designated Development as described in Clause 13 of Schedule 3 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation). Approval for the proposal is sought under Part 4 of the EP&A Act. An Environment Protection Licence (EPL) to construct and operate the proposed composting facility will also be required under the *Protection of Environment Operations Act 1997*.

1.1.1 Construction

Construction is anticipated to take 8-12 months and will be undertaken in two stages:

- Stage 1 – Ancillary and Enabling Works including road upgrades and connection of utilities to the Site.
- Stage 2 – Main works including:
    - Site mobilisation;
    - Excavation and civil works;
    - New building works;
    - Pavement works; and
    - External and miscellaneous works.

All excavated material (excluding weeds and organic materials) will be reused on-site as fill material. No imported fill material is anticipated to be required for the construction works.

1.1.2 Operation

A commercially available enclosed Tunnel Composting System (TCS) technology will be utilised for the proposed ORF. The TCS will be housed within a connecting shed adjacent to the Receivals Shed and comprise 7 enclosed tunnels for pasteurisation of the organic material. The tunnels (approximately 8m wide, 26m long and 5m high) will be arranged side by side. The system is supported by a biofilter with an integrated humidifier and a leachate collection system.

Each tunnel is self-operating and comprises an air duct system, blowers, process water collection and recycling systems and various process control features (temperature, pressure, etc.). The tunnel floor (i.e. aeration floor) allows the inflow of leachate and outflow of air into the composting material. Access to each tunnel is via a large front door, which during the pasteurisation process is locked hermetically to contain any odour and leachate.

Following receival into the Receivals Shed, organic materials are screened, shredded and mixed before being loaded into the tunnels for pasteurisation. The facility will utilise a two-stage tunnel composting process comprising 28 days residence time (2 x 14 days) to guarantee pasteurisation in accordance with Australian Standard AS4454-2012: Composts, Soil Conditioners and Mulches (AS4454). The material will be pasteurised at approximately 55-65 ºC.

The pasteurised product from the tunnels will be transported by front end loader to the maturation area for maturation in stockpiles of up to 2-3 metres high. Stockpiles will be formed in a trapezoidal shape in windrows 40 m in length allowing the compost to mature for up to 6-8 weeks with some windrow moistening and turning if required.

The composting process will be monitored in accordance with framework provided by AS4454 and an Environmental Management System (EMS) approved by TRC and the NSW EPA. Material sampling, quality testing, field testing and operational auditing will also be undertaken. The proposed facility will also be operated in compliance with the EPL required for operation. The testing of the material will include at least the following:

- Temperature testing of each compost batch on a daily basis;
- Moisture testing of each compost batch on a weekly basis or as required;
- pH testing of compost as required;
- Oxygen and / or carbon dioxide testing of compost batches as required;
- Product maturity using Solvita test kits or equivalent; and
- Physical and chemical contaminants in the final product.

The compost products produced at the proposed facility will be of a high quality suitable for sale in both agricultural and urban amenity markets such as landscaping. The biological and physical properties of the products will be in accordance with Australian Standard AS4454-2012: Composts, Soil Conditioners and Mulches (2012).

The layout of the Proposal is shown in Figure 1.

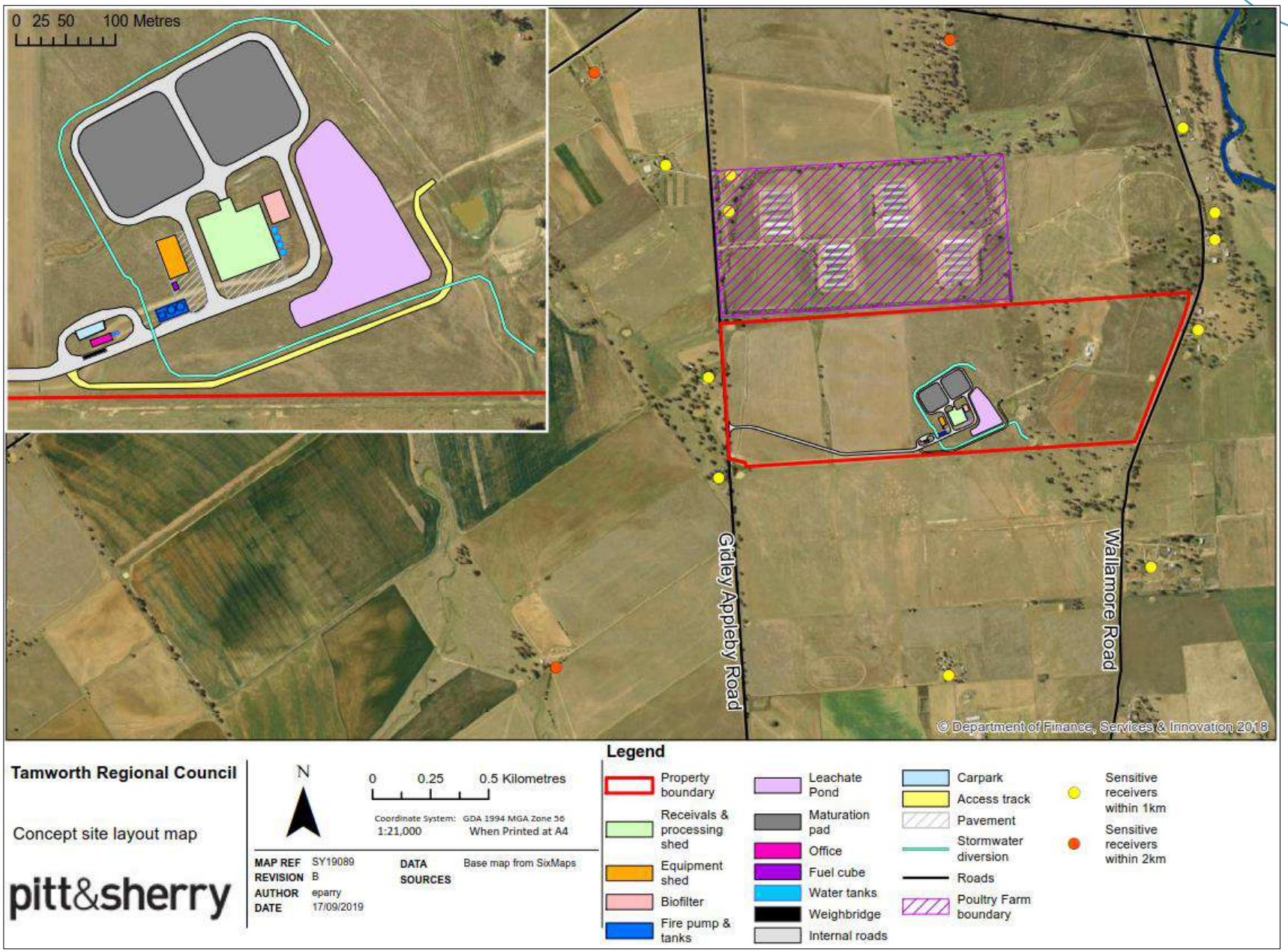

Figure 1 Site layout

2. SEPP 33 risk screening

The SEARs specified that the assessment of the Proposal must include a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 — Hazardous and Offensive Development and Applying SEPP 33 (DoP 2011).

2.1 State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33)

SEPP 33 provides an approach to assessing projects for potentially hazardous and offensive development for the purpose of industry or storage. A development is considered potentially hazardous and requires a Preliminary Hazard Analysis (PHA) if the storage or transport of hazardous materials exceeds specific screening thresholds outlined in SEPP 33. In accordance with SEPP 33 a preliminary risk screening has been completed for the Proposal to determine whether a PHA is required to support the development application (DA).

2.2 Applying SEPP 33

Hazardous and Offensive Development Application Guidelines- Apply SEPP 33 (Applying SEPP 33) provides guidelines for interpreting and applying SEPP 33. These guidelines assist in determining if SEPP 33 is relevant to a proposal and provides procedures for assessing hazardous or offensive developments.

Apply SEPP 33 provides a risk screening process to identify potentially hazardous development as shown in Figure 1 below. The screening thresholds and factors that can make a development hazardous are established in these guidelines. A preliminary hazard analysis is required to be undertaken if the risk screening procedure identifies that the Proposal as a ‘potentially hazardous industry’.

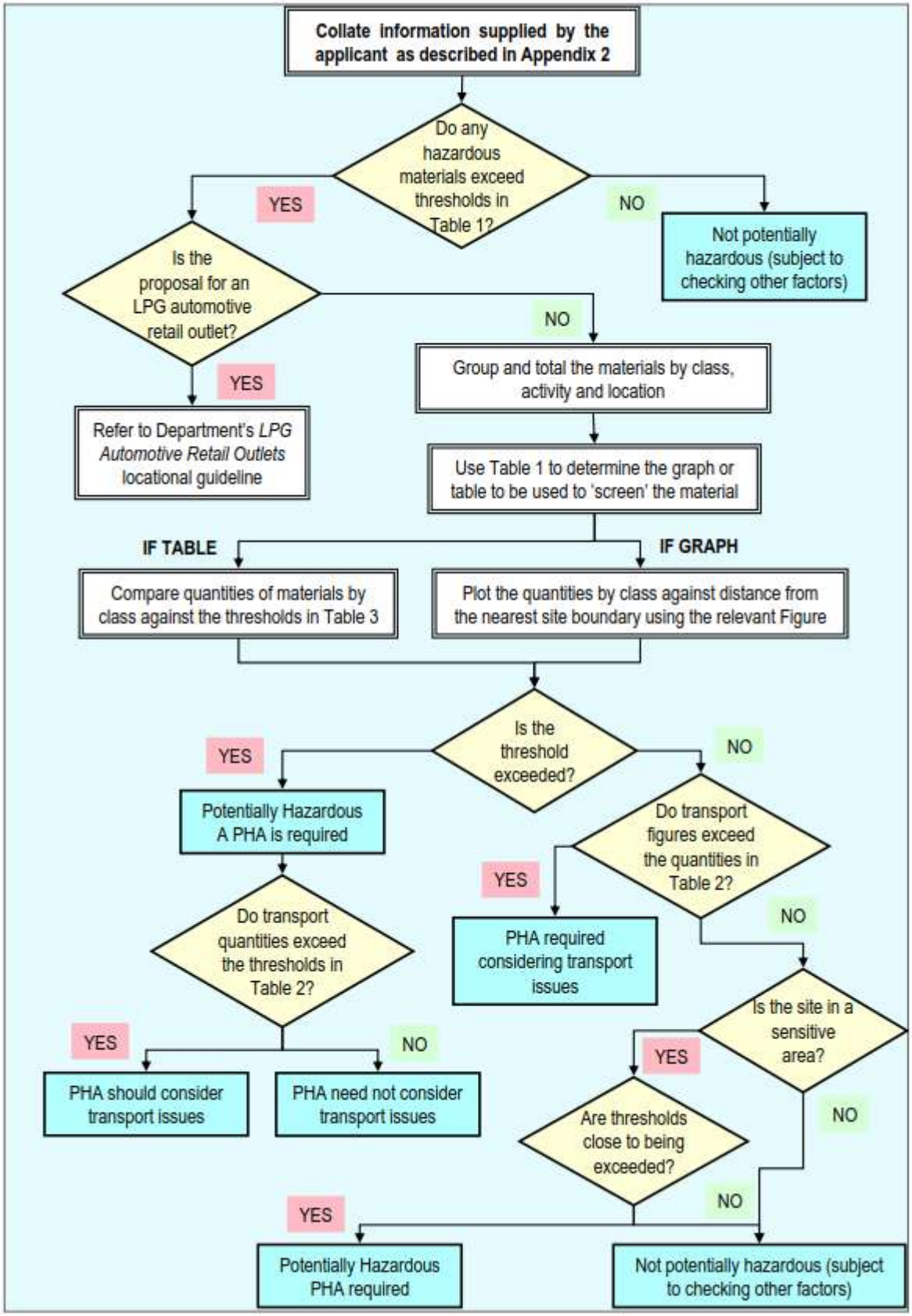

Figure 2 Risk screening procedure (DoP 2011)

2.2.1 Hazardous materials

A Preliminary Risk Screening has been completed in accordance with SEPP 33 and Applying SEPP 33. To determine if the Proposal is potentially hazardous, the following information was collated and provided in Table 1:

- A list of all the hazardous materials used in the proposed development and the quantity of each;
- The dangerous goods classification for each material;
- The mode of storage used;
- The distance of the stored material from the Site boundary for any of the materials in dangerous goods classes 1.1, 2.1 and 3; and
- The average number of annual and weekly road movements of hazardous material to and from the facility, and the typical quantity in each load.

Table 1 Material description and screening

Product	Dangerous Goods Classification (NTC 2018)	Quantities	Threshold	Storage location
Putrescible materials (including FO, GO, timber, liquid waste, offal, animal mortalities, paunch and animal manures and bedding).	Not applicable	35,000 tpa at capacity	N/A	This material will be transported to Site and stored within the tunnels and Receivals area.
Recycled organic products (including composted soil conditioner and composted mulch). Note: This product has undergone 28 days pasteurisation	Not applicable	19,000 tpa at capacity	N/A	This material will be stored in rows adjacent to buildings and transported from Site.
Leachate	Not applicable	Leachate dam designed to store 16ML	N/A	In the leachate dam
Diesel storage for operation of plant and equipment	C1 combustible liquid	10,000L	N/A	Fuel Cube
Unleaded petrol	Class 3 PG II	200L	5000 kg	Equipment Shed
Oils and lubricants	Class 3 Flammable Liquid	Only household quantities will be stored on-site for minor general maintenance of plant and equipment	5000 kg	Equipment Shed
Wastewater for off-site disposal	Not applicable	Septic Collection Tanks with pump outs (as required) or potentially consideration of composting toilets.	N/A	Adjacent to the office

Product	Dangerous Goods Classification (NTC 2018)	Quantities	Threshold	Storage location
Pesticides and Herbicides	Not Applicable	Only household quantities will be stored on-site for minor general maintenance of plant and equipment	N/A	Within the facility

As shown in Table 1, the quantities of dangerous goods proposed to be stored on-site are well below the screening thresholds and do not trigger the requirement for a PHA. All identified dangerous goods will be stored over 100 metres from the site boundary and over 800 metres to the nearest residential receiver.

According to the Applying SEPP 33, a development is considered potentially offensive if the development requires a pollution control licence (e.g. EPL). If the licence conditions could not be met, the proposed development would be considered offensive. An EPL is required for the Proposal but all conditions of the licence will be met.

Any general solid waste (putrescible) and general solid waste (non-putrescible) received for processing at the proposed facility will be assessed and classified in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (DECC, 2008). Non-compliant product will be further processed or disposed of at a facility licensed to accept it as a waste. Any physical contaminants will be removed through manual picking and / or screening methods and will be classified and transported to a suitably licenced facility for disposal.

2.2.2 Other risk factors

Other risk factors associated with the Proposal were considered in accordance with Applying SEPP 33 as shown in Table 2 below. No risks were identified which required the preparation of a PHA.

Table 2 Consideration of other risk factors

Risk factor (DoP 2011)	Comments
Any incompatible materials (hazardous and non-hazardous materials).	No
Any wastes that could be hazardous.	Inspection and screening of received organics will be conducted within the Receivals Shed and loads with excessive contamination will be rejected. Any physical items of contamination will be manually removed prior to processing.
The possible existence of dusts within confined areas.	No
Types of activities the dangerous goods and otherwise hazardous materials are associated with (storage, processing, reaction, etc.).	Only as described in Table 1

Risk factor (DoP 2011)	Comments
Incompatible, reactive or unstable materials and process conditions that could lead to uncontrolled reaction or decomposition.	No
Storage or processing operations involving high (or extremely low) temperatures and / or pressures.	The material will be pasteurised at 55-65 ºC.
Details of known past incidents (and near misses) involving hazardous materials and processes in similar industries.	No

3. Risk Assessment

A preliminary risk assessment was prepared for the proposal which considered normal operations, abnormalities in the operations, natural disasters or impacts, and external intervention such as terrorism, vandalism or residential encroachment. The findings are briefly discussed in this section while details of the assessment are included in Appendices A and B. A bioaerosol risk assessment has also been undertaken by Todoroski Air Sciences and included in Appendix C.

This preliminary risk assessment would be reviewed and updated during detailed design and prior to construction and operation by TRC.

3.1 Methodology

Likelihood of occurrence of the identified potential hazards are assessed based on experience from previous similar operations, general consensus and other assessment reports available on the project. All the hazards are assigned a likelihood of 1 (rare) to 5 (certain) in the risk spreadsheet as per Tables below.

Once the hazards were identified, risk evaluation was undertaken by assigning likelihood and consequences as per the risk matrix provided in Table 3 and Consequences are defined in Table 4.

A fault tree analysis was not considered necessary based on the process undertaken. If a particular hazard was found to have significant risk associated with it, risk mitigation / control measures are prescribed in the risk register spreadsheet, predominantly aimed at reducing the likelihood.

Table 3: Risk Matrix

		Consequence	1	2	3	4	5
			Negligible	Minor	Moderate	Major	Catastrophic
Likelihood	1	Rare (<5%)	1	2	3	4	5
	2	Unlikely (5-15%)	2	4	6	8	10
	3	Moderate (15-40%)	3	6	9	12	15

	4	Likely (40-70%)	4	8	12	16	20
	5	Certain (70%+)	5	10	15	20	25

The consequences are defined as per Table 4.

Table 4: Definition of consequences

Areas of interest	Definition of consequences				
	Negligible	Minor	Moderate	Major	Catastrophic
Safety	Cut, scrape or bruise	First aid	Lost Time Injury	Serious injury	Fatality
Environment	No measurable environmental impact	Incident	Reportable incident	Compliance breach	Tier 1 POEO offence
Public and off-site environment	-	-	Complaint	Authority investigation	Prosecution
Plant, operations and costs	No cost issue	Minor equipment damage with minor cost	Plant damage without interruption of operations	Plant damage impacting process	Significant plant or off site damage

3.2 Risk Management

Details of the preliminary risk assessment process are shown in the risk register provided in Appendix A. In the risk register, the potential hazards of the Proposal, which may present significant risks are assessed. The control measures for these hazards are then assessed and the residual risk is captured in the risk register. The register is envisaged to be maintained by TRC as a live document during the various phases of the project, employing routine risk monitoring and recording of progress where necessary.

During the construction phase, the Site will be handled by the contractor, as such, all risks applicable will be managed as per specific Construction Environmental Management Plans (CEMP). The site preparation and construction phases of the project are expected to release dust emission which is unavoidable in a construction project of this scale. No hazardous emissions are expected during construction.

During the operation of the Site, the enclosed design of the receiving and pasteurisation processes, as well as covered transportation vehicles, will minimise any emissions to the atmosphere on the site. Liquid waste is delivered directly to bunded tanks. A detailed air quality assessment was undertaken including dispersion modelling for impacts beyond the premises.

Generally, the risks classified as significant relate to hazards that are likely for operations of similar nature and scale and application of due diligence during various phases of the Proposal are seen to mitigate the risks to acceptable levels. Hazards associated with the on-site collection of leachate, bird strike and biosecurity risk are assessed further below.

3.2.1 Contamination from leachate

Leachate is defined as any stormwater that contacts and may be grossly contaminated by raw or processed organic materials. Contaminants of concern include organic matter (biochemical oxygen demand – BOD), nutrients (in particular

nitrogen and phosphorus), tannins and microbial pathogens. Leachate generally poses the greatest risk to water quality. Leachate is distinct from the relatively cleaner stormwater generated in other parts of the site, that does not come in contact with bulk organic materials.

The facility has been designed to prevent mixing of relatively clean stormwater with the organics received and the composting areas. Any surface water that comes in to contact with the processing and/or storage areas is managed as leachate. All leachate run-off generated will flow to a leachate dam using gravity in dedicated drainage lines which will prevent leachate from contaminating the subsoil.

The leachate dam has been sized to accommodate 16ML as determined in the Water Balance. Leachate from the dam will be reused on-site for watering the unpasteurised batches of organic material.

The leachate dam has been designed with a freeboard and spillway and levels will be monitored regularly alongside weather forecasts to ensure the dam does not overflow during rain events. In accordance with the Composting Guidelines the design includes freeboard that can accept a 1-in-10 year 24-hr rainfall event for additional storage and reuse, which adds additional capacity in the event of a larger storm.

Leachate dam levels would be monitored and identify the need for excess leachate to be removed (i.e. will be trucked off-site to an appropriately licenced facility) to ensure dam levels remain suitable for Site operations and forecasted weather events.

During extreme weather events (e.g. larger than 1-in-10 year 24-hr rainfall) the design of the leachate allows overflow (above the design storm criteria) into the stormwater dam, then offsite into Peel River during high river flow conditions.

An Operational Management Plan (OMP) will be prepared to manage operation of the proposed facility. As part of the OMP appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them.

3.2.2 Operational fire

Organic recycling facilities can pose a fire risk due to the temperatures reached during the composting process. Buildings and equipment used on-site by staff for construction and operations also increases the risk of human-caused fires. Therefore, in accordance with the *Environmental Guidelines – Composting and Related Organics Processing Facilities (DEC 2004)* a fire management strategy will be prepared for the Proposal.

To control a fire outbreak, the proposed facility has been designed to include:

- A 10m wide asset protection zone around the perimeter of the site for use as an access road for the fire brigade;
- Nine fire hydrants operating simultaneously. The Site will not use municipal reticulated water to provide the fire water so two fire tanks and two diesel engine powered fire pumps have been included in the design; and
- Sufficient coverage of the proposed office building and equipment shed will meet the requirements of the National Construction Code (NCC) 2016.

The Site will be managed in accordance with the Fire Safety Guideline: Fire safety in waste facilities (Fire and Rescue NSW2018). The storage and stockpiles including the windrows on the maturations pads, will be arranged so as to minimise build-up of a fuel and allow space for fighting access. Monitoring of moisture content and watering of composting material will be undertaken as required

It is considered that with the implementation of the fire management strategy, mitigation measures, operational procedures and design of the facility, the risk associated with operational fire hazards will be managed to an acceptable level.

3.2.3 Bird Strike

The National Airports Safeguarding Framework (Guideline C) identifies organic waste and putrescible waste facilities as a high wildlife attraction risk and are considered incompatible within 3km of an airport, must be mitigated within 8km and

monitored within 13km. The Site is located within the 13km buffer zone of the Tamworth Airport (YSTW).

The existing site is mostly cleared and provides minimal habitat for bird species. Organics-processing facilities with exposed, rapidly biodegradable organics may attract a large number of birds, particularly gulls and ibis; which can lead to noise problems and the spread of food scraps away from the site. Additionally, due to the proximity of Tamworth Regional Airport to the Site there is a potential risk of bird strikes with aircraft should the Site attract birds.

The risk of attracting birds is more likely on poorly managed sites that stockpile uncovered putrescible organics and release odour. The enclosed Receival Shed and TCS minimise the likelihood of attracting birds (Avisure 2018). The Proposal will significantly reduce these risks via the design of a fully enclosed Receival Shed and by undertaking pasteurisation within an enclosed TCS. Some residual risk will remain for birds to be attracted to the compost stockpiled on the maturation pad however this is considered to be a low risk due to this product having undergone the 28 day pasteurisation process.

As aircraft may still be within an altitude where avian wildlife are flying above the proposed ORF location, further monitoring and assessment is proposed. A pest and weed management plan will be developed, which will outline the measures to manage and monitor animals including birds on-site during operation. The number of birds visiting the Site and presence of roosting Sites will be monitored and should any in increases in bird presence be observed, the waste management measures will be reviewed and improved, and the Tamworth Regional Airport will be notified. Open communication channels will be established between the ORF Site and the Tamworth Regional Airport.

3.2.4 Biosecurity breach

The Site is located in a rural area and surrounded by land used for agricultural purposes including chicken farms, grazing and cropping land. Due to Proposal including the transport and handling of organic materials, the potential for both plant and animal diseases to cause a biosecurity risk to agriculture needs to be considered. A preliminary biosecurity risk assessment was prepared and Appendix B as a risk table. Hazard analysis specific to biosecurity issues did not reveal significant risks related to various aspects of the development and operation of the ORF. Specific biosecurity hazards including various plant and animal disease vectors have been included in the review.

Pathogens carried in the collected organic material potentially escaping from the truck during transit has been considered. Organic material will be from local and regional sources. The transport routes to and from the Site will pass through agricultural, industrial (poultry farms) and residential areas. Processing the organic material quickly and ensuring delivery trucks are properly sealed will minimise any biosecurity risks, such as the reproduction of Queensland fruit fly and American Foulbrood or Potato Cyst Nematode. To prevent spread and infestation of the insect phylloxera, which is prevalent in identified Phylloxera Infested Zones (PIZ), State Legislation includes measures to restrict or prohibit movement of phylloxera risk vectors such as grapevine material, grape products and vineyard/winery equipment/machinery. The proposed ORF is located in an area that has been classified as Phylloxera Biosecurity Zone (PEZ) and no organic material will be transported to the proposed facility from infested zones.

The Receivals Shed has been designed to fully enclose the compostable materials dropped off on-site and provide a suitable, controlled area for unloading of incoming organic materials. The material received will be processed for approximately 10-12 weeks including 28 days pasteurisation within the TCS. Pasteurisation for 28 days is twice the duration recommended by the indicative TCS supplier and the NSW EPA. This will be followed by 6 to 8 weeks maturation in the windrow system.

During the first 14 days of the composting process, the organic material will be pasteurised at around 55-65 ºC to destroy pathogens and denature weed seeds. The pasteurisation process will eliminate the viable plant matter and pathogens in the organic material prior to it being placed on the maturation pads. The proposed facility has been designed to securely store all organics, contaminated products and process residues that cannot be beneficially processed at the facility, until they can be disposed of at a suitably licenced facility.

The potential for attracting birds to the proposed facility has been considered as it may facilitate the spread of pathogens to and from the area. The extensive tunnel composting process and enclosed Receival Shed minimise the likelihood of attracting birds. The risk of attracting birds is more likely on poorly managed sites that stockpile uncovered putrescible organics and release odour (Avisure 2018). After the pasteurisation process, the biodegradable substances in the composting product will have decomposed and the odour is anticipated to be minimal. A pest and weed management plan will be developed, which will outline the measures to manage and monitor weeds and animals, such as birds on-site.

An assessment of the potential risk of bioaerosol and pathogen dispersion was undertaken for the proposal as shown in Appendix C. A review of the available studies on bioaerosol generation at composting facilities shows that bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind. The air dispersion modelling conducted for the Proposal shows that the levels of bioaerosols emitted would be diluted by approximately 1,000 times at a distance of approximately 200m and therefore would be at background levels at this distance. The poultry farm neighbouring the Site is located approximately 500m from the proposed facility. The bioaerosols from the Proposal would be diluted approximately 5,000 times or more before reaching the farm. Therefore, the impact from the Proposal on the nearest residents and poultry farm would be negligible.

Planned controls including adequate design and site management is expected to control the risk to biosecurity, with ongoing implementation of these controls and monitoring. The responsibility of applying risk treatment action of containment of transported material and on-site rests with the operator of the facility with reduced risk level after the containment. The composting process will be monitored in accordance with framework provided by AS4454 and an Environmental Management System (EMS) approved by TRC and the NSW EPA. Biosecurity risks will be managed in accordance with the Biosecurity Act 2015.

3.3 Mitigation measures

Recommended mitigation measures are outlined in Table 5.

Table 5 Hazard and risk mitigation measures

Ref	Mitigation Measures
Construction Mitigation Measures	
HR1	Review and adapt safety precautions into the design of the facility.
Operational Mitigation Measures	
HR2	In the Operational Management Plan include appropriate response procedures for situations where overtopping, breach or other failure of the leachate dam is possible and ensure all Site staff are appropriately trained to enact them. This should include implementation of additional leachate control measures and appropriate pathogen control measures.
HR3	In accordance with the *Environmental Guidelines – Composting and Related Organics Processing Facilities – Issue 12 - Fire Management* (DEC, NSW) and *Fire Safety Guideline: Fire safety in waste facilities* (Fire and Rescue 2018), a fire management strategy will be prepared for the Proposal. The fire management strategy should identify the following: • The potential causes of fire at the composting facility; • The procedure to follow, persons responsible, and equipment to be used in the event of a fire. This will include on-site resources and external resources (such as the Rural Fire Service), and details of how the procedure will operate on a 24-hour-a-day basis; • The maintenance schedules for all fire-fighting equipment and facilities. At a minimum, all equipment and facilities should be visually checked for damage on a weekly basis, and test-operated on a quarterly basis; • Details of all the fire-fighting equipment that will be installed at the flammable store and at Site buildings; • How all fire-fighting equipment will be clearly signposted and how access to it will be ensured at all times; • Details of the firebreaks to be constructed and maintained around all filled areas, stockpiles of combustibles, gas extraction equipment and Site buildings; • Management of storage and stockpiles; and

Ref	Mitigation Measures
	• Training of facility staff in fire-fighting techniques.
HR4	The risk register will continue to be maintained and developed to review ongoing activities and risks.
HR5	Develop and adapt standard operating processes / procedures based on experience, requirements and ongoing monitoring and measurement of risks.
HR6	The Biosecurity Act will be taken into consideration when planning the detailed design of the facility and quality operational process controls to ensure biosecurity measures are upheld.
HR7	A Waste Management Plan will be prepared for the Site including measures to ensure no organic material is imported to Site from Phyllozera infested areas.
HR8	Ensure biodegradable organics and compost stockpiles are well managed so as to minimise odour generation and avoid attraction of nuisance pests and vectors, including birds.
HR9	Prepare a pest and weed management plan (PWMP) to manage pests animals, reduce the spread of weeds and control weeds on Site and on soil stockpiles and adjacent roadways. The PWMP should include mitigation measures such as: the checking and cleaning of vehicles prior to entering and leaving the Site, as well as disposing of known weeds appropriately, and monitoring of birds and other animals and insects.
HR10	Monitoring of bird numbers visiting the Site and potential roosting locations on-site will be conducted. Should increased numbers of birds or roosting sites be observed, the airport will be notified, and the waste management measures will be reviewed and improved.

4. Conclusion

The overall conclusion of this risk assessment is that the proposed development of the ORF, as per current plans and designs being developed, does not constitute high risk activities after risk controls are in place.

A preliminary risk screening completed in accordance with *State Environmental Planning Policy No. 33 — Hazardous and Offensive Development* and Applying SEPP 33 and identified that the quantities of dangerous goods proposed to be stored on-site are well below the screening thresholds and do not trigger the requirement for a PHA. The risk screening identified this project not to constitute a hazardous / offensive development provided proper initial and planned risk control measures are in place.

Site preparation and construction of the facility would involve hazards that are expected and managed at any construction site and do not pose any additional risks.

During the operation of the facility, controls in place as proposed such as the design elements considered, would assist in the management of hazards identified in this report. It has been assessed that most of hazards carry low risk and can be controllable by employing standard operating procedures and normal due diligence expected in a waste management facility.

Recommendations to reduce construction risks include implementing the recommended mitigation measures including preparing a Waste Management Plan and Fire Management Strategy.

Recommendations to reduce significant operational risks include review and adaptation of safety precautions and management measures into the design of the facility, development and adaptation of standard operating processes based on experience and requirements as well as based on ongoing monitoring and measurement of risks.

The risk register assigns responsibilities to parties involved in the development and operation of the Tamworth ORF to improve risk management through additional risk control actions. This needs to be monitored and measured for

progress. It is recommended that the preliminary risk register developed during this hazard analysis is maintained as a live register to review ongoing activities and risks and updated to reflect ongoing conditions.

5. References

AP Business Technology Consultancy (AP) 2018, *Tamworth Tunnel Composting Facility* (1804_021_C_R0),

Avisure 2018, *Desktop Bird Strike Assessment Report*, Sydney (Appendix M of the EIS)

Department of Environment and Conservation (DEC) 2004, *Environmental Guidelines – Composting and Related Organics Processing Facilities,* NSW

Department of Planning (DoP) 2011, *Hazardous and Offensive Development Application Guidelines- Apply SEPP 33*, NSW

Department of Primary Industries (DPI) 2018, *Grapevine phylloxera*, https://www.dpi.nsw.gov.au/agriculture/horticulture/grapes/publications/grape-phylloxera, [accessed 02 July 2019].

Environment protection Authority (EPA) 2014, *Waste Classification Guidelines Part 1: Classifying Waste*, viewed: https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste [accessed 02 July 2019]

Fire and Rescue NSW 2018, *Fire Safety Guideline: Fire safety in waste facilities*, Fire and Rescue NSW, NSW

National Airports Safeguarding Advisory Group (NASAG) 2018, *The National Airports Safeguarding Framework*, https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/nasf_principles_guidelines.aspx

National Transport Commission (NTC) 2018, *Australian Code for the Transport of Dangerous Goods by Road and Rail - Edition 7.6*, viewed https://www.ntc.gov.au/Media/Reports/(A890348C-BEE7-3C64-A770-E98CFD8DDEFA).pdf [accessed 02 July 2019]

Preliminary risk register

Appendix A

Hazard Identification			Risk Analysis (see risk register tab for details)					Risk Treatment					
Source of Risk	**Identified Risks / Hazards (opportunities & threats)**	**Leading to . . .**	**Existing / Initial Controls of Identified Risk / Hazard (If any)**	**Likelihood *(1 - 5)***	**Consequence *(1 - 5)***	**Risk Rating**	**Is the Risk Significant? Yes ≥8 No <8**	**Treatments / Actions**	**Responsibility**	**Timing**	**Residual Likelihood *(1 - 5)***	**Residual Consequence *(1 - 5)***	**Residual Risk Rating**
Construction	Earthworks	Erosion and sediment issues	Contractor to prepare and implement Ensure Erosion and Sediment Control Plan (ESCP)	4	4	16	YES	ESCP is implemented, undertake site control audits	Contractor TRC	During construction phase	2	3	6
Construction	Earthworks	Dust	Contractor to prepare and implement construction dust management plan	4	3	12	YES	Ensure dust management plan is implemented, undertake site control audits	TRC	During construction phase	2	2	4
Construction	Construction waste	Inappropriate disposal	Contractor to prepare and implement construction waste management plan	3	3	9	YES	Ensure CWMP is implemented, undertake site control audits	TRC	During construction phase	2	3	6
Site Preparation	Dust during excavation	Dust issues for receivers	Contractor to prepare and implement dust management plan with dust control measures	3	3	9	YES	Ensure dust management plan is implemented, undertake site control audits	TRC	During site preparation phase	2	3	6
Sediment & Erosion	Rainfall causing sediment transport	Peel river contamination / local waterways contamination	Contractor to manage Site sediment control	4	4	16	YES	Ensure ESCP is implemented, undertake site control audits	TRC	During site preparation and construction phases	2	3	6
Sediment & Erosion	Erosion during construction	Causing sediment flow	Site has low slope; contractor to prepare and implement Erosion and Sediment Control Plan (ESCP)	4	4	16	YES	Ensure erosion is managed - undertake site control audits	TRC	Preparation and construction phases	2	3	6
Groundwater flow	Potential for Site to be contaminated from surrounding Site uses	Site contamination during site preparation, construction or operation	Undertake geological assessments, groundwater assessment and phase 1 contamination assessment where historical use identifies potential risks.	3	3	9	YES	Site assessments to be undertaken as part of EIS	KMH	Approvals phase	2	2	4
Operation -	Stormwater	Contaminated leachate	The design to incorporate adequate drainage including for storm events and ensure these are not blocked.	3	3	9	YES	Have adequate leachate and stormwater dam freeboard in design	KMH	Design phase	2	3	6
Operation	Pathogens / vermin	Biosecurity issues	Assess biosecurity risks and undertake mitigation measures	2	4	8	YES	Containment of transported materials, composting in accordance with Australia Standards, containment of contaminated material on-site	Operator	Operation phase	2	2	0
Operation	Spontaneous combustion / bushfire	Fire damage to site	Undertake routine temperature and weather monitoring and observe bushfire notifications	3	3	9	YES	Operator to maintain monitoring systems and records	Operator	Operation phase	2	2	4

Hazard Identification			Risk Analysis (see risk register tab for details)					Risk Treatment					
Source of Risk	**Identified Risks / Hazards (opportunities & threats)**	**Leading to . . .**	**Existing / Initial Controls of Identified Risk / Hazard (If any)**	**Likelihood *(1 - 5)***	**Consequence *(1 - 5)***	**Risk Rating**	**Is the Risk Significant? Yes ≥8 No <8**	**Treatments / Actions**	**Responsibility**	**Timing**	**Residual Likelihood *(1 - 5)***	**Residual Consequence *(1 - 5)***	**Residual Risk Rating**
Organic Material handling	Noise from Site plant / equipment	Complaints from receivers	Operator to prepare and maintain noise management plan; ensure equipment and plant are working properly within allowable decibel levels	2	4	8	YES	Stop work if noise levels leading to complaints; implement mitigation measures	Operator	Operation phase	2	2	4
Organic Material handling	Spills	Organic Material on the road	Ensure vehicles used are maintained properly, implement spill management plan. Ensure all loads are covered.	2	4	8	YES	All vehicles should have spill management kit	Operator / contractor	Operation phase	2	2	4
Organic Material handling	Bird strike	Aviation incident	Biodegradable organics will be stored in enclosed spaces and then composting will be undertaken in tunnel. Open stockpiling will only occur for products after the pasteurization stage.	2	4	8	YES	Ensure biodegradable organics and compost stockpiles are well managed so as to minimise odour generation, ongoing monitoring	Operator / contractor	Operations phase	2	2	4
Organic Material handling	Process conditions not right	C:N ratio not correct, leading to anaerobic conditions or slow process	Ensure correct parameters based on current known waste streams and quantities	3	3	9	YES	Will need additional material on hand to cater for immediate needs	Operator	Operation phase	1	2	2
Flooding	Leachate dam overflow	Contamination is spread to surrounding areas by flood waters	Site stormwater and leachate dams to be designed with freeboard as per guidelines (10-year storm)	2	4	8	YES	Have additional flood mitigation measures, monitor weather and adjust stockpiling / operations accordingly; communicate with SES if required	TRC	Operation phase	1	2	2
Time	Delays in site prep and construction	Project start delays and operations affected	Contractor's program management to review progress	2	4	8	YES	Monitor procurement processes	TRC	Approvals phase	1	2	2
Procurement	Delays in procurement of tunnel components	Project start delays and operations affected	Procurement plan and timely ordering of long lead items, as identified in program reviews	2	4	8	YES	Monitor procurement processes	TRC	Procurement phase	1	2	2
Pathogens	Equipment reliability and operations process issues	Pathogen inactivation inadequate	Operator to undertake process monitoring for temperature and other relevant conditions	2	4	8	YES	Re-processing may be required or other alternate measures to ensure product conversion and maturation occurs	Operator	Operation phase	1	3	3
Pathogens	Incoming organic material with high pathogens	Pathogen inactivation inadequate / stormwater contamination	Operator to undertake process monitoring and leachate dam water quality testing	2	4	8	YES	Re-processing may be required or other alternate measures to ensure product conversion and maturation occurs	Operator	Operation phase	1	3	3

Biosecurity risks

Appendix B

Biosecurity Hazard Identification			Risk Analysis				
Source of Risk	**Identified Risks / Hazards (opportunities & threats)**	**Leading to . . .**	**Existing / Initial Controls of Identified Risk / Hazard (If any)**	**Likelihood *(1 - 5)***	**Consequence *(1 - 5)***	**Risk Rating**	**Is the Risk Significant? Yes ≥8 No <8**
Biosecurity - existing plant uses	Impact on adjacent farming operations from the transportation and potential spillage of green waste that might include plant disease vectors	Farming issues in the adjacent farm lands	Site to be protected from surrounding plant use purposes Delivery trucks to be sealed	2	2	4	NO
Biosecurity - existing animal land uses	There is no current or planned animal uses at the site – the Site to be fenced off from animal incursions					0	NO
Operation - transportation	Spread of pathogen / vermin from newly arrived organic material through airborne or leachate flows	Biosecurity issues to emissions / contaminated leachate – potential health issues	Implement measures to contain emissions and leachate as per design, implement dust suppression measures, Implement waste management plan with monitoring measures	2	4	8	YES

Biosecurity Hazard Identification			Risk Analysis				
Source of Risk	**Identified Risks / Hazards (opportunities & threats)**	**Leading to . . .**	**Existing / Initial Controls of Identified Risk / Hazard (If any)**	**Likelihood *(1 - 5)***	**Consequence *(1 - 5)***	**Risk Rating**	**Is the Risk Significant? Yes ≥8 No <8**
Operation - waste transportation	Truck accidents could cause spilling of organic materials on road	Contamination on the road	Drivers to observe road rules and traffic conditions and undertake management measures for containment of waste	1	4	4	NO
Operation - product transportation	Truck wheels could track organic materials out of Site upon exit	Contamination on the road	Trucks to exit Site after wheel wash	1	4	4	NO
Operation - contamination	Product contamination causing pathogens and weed seeds to spread through compost	Biosecurity issues to land where compost is applied	Product quality testing, process monitoring	2	3	6	NO
Operation - storm / flood	Organic material and contaminated material spread through stormwater and flooding to neighbouring land	Contamination is spread on neighbouring land	Design and construct sufficiently sized leachate and stormwater dams with adequate freeboard and drainage channels; Operator to Manage control of process as per weather predictions	1	5	5	NO
Operation - pests	Organic material could be spread by vectors such as birds and rodents	Pathogenic or plant disease-causing material spreading outside site	Operator to consider these issues in site management	2	3	6	NO
Operation - animal diseases	Pathogens affecting animals spread through emissions from Site or spread through immature product -e.g. American Foulbrood disease with bees	Spread of livestock or pet diseases in compost in open area	Operator to implement proper Site management including process monitoring, transportation monitoring; composting process is expected to remove pathogens	1	3	3	NO
Operation - plant diseases	Weed seeds or other plant diseases could survive in the product - e.g. Potato cyst nematode, phylloxera, Queensland fruit fly	Spread of plant diseases weed seeds	Operator to implement measures for incoming waste containment; product quality testing, process monitoring; composting is expected to	1	3	3	NO

Biosecurity Hazard Identification			Risk Analysis				
Source of Risk	**Identified Risks / Hazards (opportunities & threats)**	**Leading to . . .**	**Existing / Initial Controls of Identified Risk / Hazard (If any)**	**Likelihood *(1 - 5)***	**Consequence *(1 - 5)***	**Risk Rating**	**Is the Risk Significant? Yes ≥8 No <8**
			remove pathogens				
Operation - pathogens	Site personnel affected by pathogens in contaminated raw waste material	Site personnel could be affected by pathogens and become sick - leading to lost time and health issues	All personnel to observe site safety measures and have all relevant PPE as required	2	3	6	NO
Operation - Vectors / Birds	Introduction of pathogen from migratory birds attracted to the Site	Material that could cause plant or animal diseases spreading outside Site	Operator to manage biodegradable organics and compost stockpiles so as to minimise odour generation which attracts birds	2	3	6	NO
Operation - Vectors / Birds	Organic material spread by vectors such as birds and rodents	Material that could cause plant diseases or disease pathogens spreading outside site	Operator to implement adequate site management measures to avoid vectors and birds have access to waste material	2	3	6	NO
Phylloxera	Phylloxera spread through agricultural waste material	Impact on vineyards in the area or near the transportation route	The area is not Phylloxera Infected Zone (PIZ); operators not to source incoming waste materials from PIZ identified regions	1	3	3	NO

pitt&sherry

Bioaerosol Risk Assessment

Appendix c

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27 August 2019

Jessica Berry
Senior Environmental Consultant
Pitt & Sherry
Via email: jberry@pittsh.com.au

RE: Advanced Organics Recycling Facility, Tamworth NSW – Assessment of bioaerosol risk

Dear Jessica,
The following provides an assessment of the potential risk of bioaerosol and pathogen dispersion in the surrounding environment associated with the proposed Advanced Organic Recycling Facility at Tamworth (hereafter referred to as the Project).

Introduction
Bioaerosols occur naturally in the ambient air with median and mean background concentrations ranging from 1 to 100,000 colony-forming units per cubic meter (cfu/m^3) for bacteria and fungi (**Pearson et al., 2015**). These bioaerosols include a mixture of diverse microorganisms composed of bacteria, fungi, virus, and biomolecules. Bioaerosol and pathogens are found to be generated from composting facilities and can be released into the atmosphere as a fugitive particulate emission through the handling of the compost material and wind erosion or efflux from the exposed compost piles.

It is also noted that a range of agricultural activities are also significant sources of bioaerosols. For example, mean levels of bacteria in the range 10,000 to 1,000,000 cfu/m^3, are reported close to wheat harvesting (**Hameed & Khodr 2001**), and levels of 1,000 to 10,000,000,000 cfu/m^3 reported in poultry houses (**Lonc & Plewa 2011**).

The levels of bioaerosls at and near these types of sources also need to be considered, when evaluating the various potential impacts of a proposed facility on the health of workers, residents and other activities in off-site areas.

Bioaerosol dispersion and concentration
The United Kingdom Environment Agency sets acceptable levels of exposure to bioaerosols from composting operations at 300, 1000 and 500 cfu/m^3 for gram-negative bacteria, total bacteria and Aspergillus fumigatus (A. fumigatus) respectively (**Environmental Agency, 2010**). Composting facilities must be either 250m away from receptors, or if closer, must show that these acceptable levels are met. The 250m buffer is based on the consensus of various studies presenting bioaerosol concentrations declining down to background levels within 250m downwind of large composting facilities (**Environmental Agency, 2010**).

The acceptable levels established for bioaerosols are not based on dose-response relationships or health based thresholds (**Pearson et al., 2015**), hence most assessments and other guidance relate to distances required for bioaerosols to be reduced to levels representative of background (as described in **Environmental Agency, 2010**).

The mere presence of bioaerosols does not necessarily create a situation where there are significant health risks. Whether or not a bacteria or pathogen is successful in causing disease is related to the health of the individual and the state of his or her immune system as well as the number of bacteria or pathogen cells required to make a person ill (infective dose). It is possible for exposure to a bacteria or pathogen to result in no infection, infection without illness or infection with illness (**Pahren, 1987**). The infective dose tends to be subjective and while it can be determined that the severity of a response is generally proportional to exposure (**Pahren, 1987**), it is difficult to determine quantitative health based guidelines.

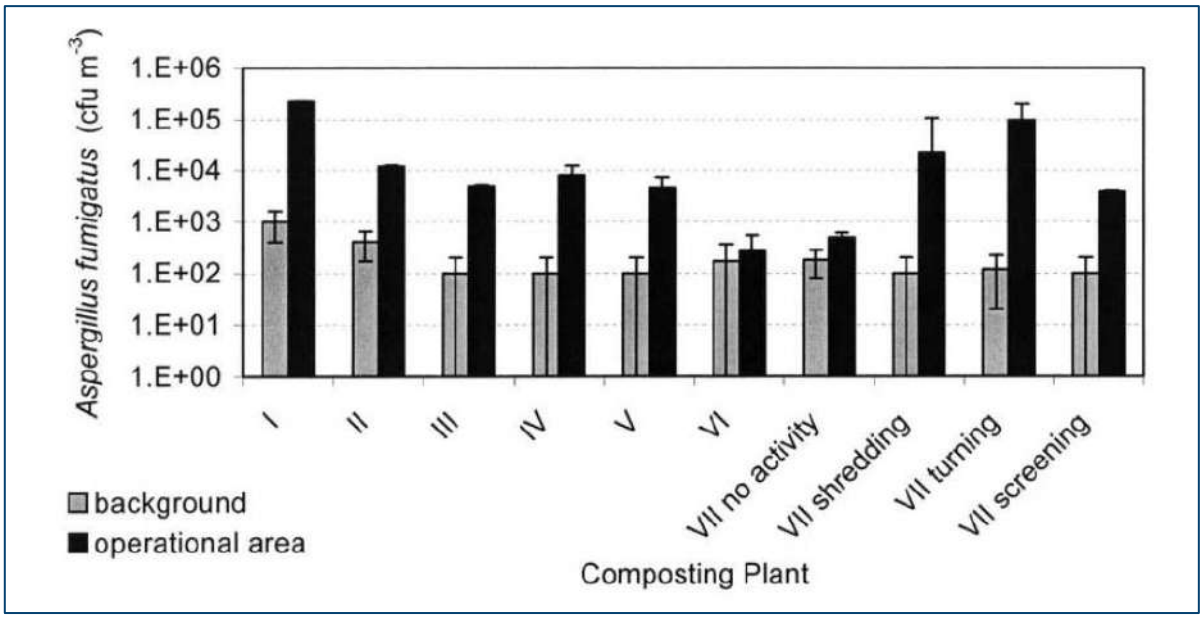
Evidence of exposures and health effects associated with composting facilities is largely occupational, for workers within such facilities. Such evidence within communities surrounding existing composting facilities is however limited, with no studies available which can be used to determine any quantitative, dose-response relationships (**Pearson et al., 2015**). On a qualitative basis these studies, as reviewed by **Pearson et al (2015)**, support the UK guidance in terms of the 250m buffer as protective of community health.

A review of other literature reports levels of bioaerosol declining to background levels at distances typically ranging from 150m to 500m beyond the composting facility (**Wéry, 2014**). The transport of bioaerosol from a composting operation is most likely determined by the meteorological conditions at the time (**Sánchez-Monedero et al., 2005**). The generation of bioaerosol concentrations at composting operations increase during compost agitation activities such as turning, shredding and screening (**Pearson et al., 2015; Sánchez-Monedero et al., 2005**).

The effect of compost agitation activity is demonstrated by the measured variation in bioaerosol generation by different activities taking place in **Figure 1** and **Figure 2** (**Sánchez-Monedero & Stentiford, 2003**). It should be noted that the compost agitation methods included large purpose built machinery which in one case flung a stream of compost though the air in a large arc to form a new windrow beside the machine as it travelled along. The other agitation methods examined included the use of a front end loader dropping material from the full reach height of the machine. Whilst a front end loader would be used in this case, it is not proposed to use a windrow turning machine which would toss material a long way through the air.

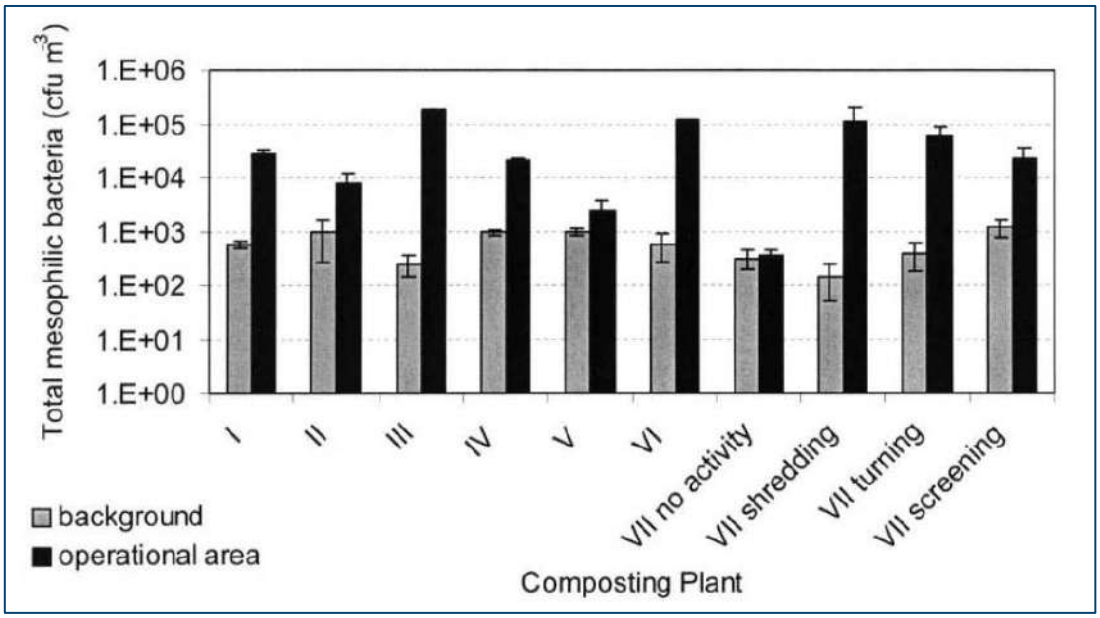
The study by **Sánchez-Monedero & Stentiford (2003)** measured background bioaerosol levels upwind of six composting facilities, and also the bioaerosol levels at the facility at the same time. The study found that the highest concentrations measured at the operational area were up to approximately 1,000 times higher than the upwind background levels (refer to **Figure 1** and **Figure 2**). This is consistent with results from a number of other studies conducted near composting facilities as summarised by **Pearson et al (2015)**, refer to **Figure 3** and **Figure 4**.

Overall the available studies which have been able to clearly identify the bioaerosol emissions from a composting facility amongst the background data, suggest that whilst composting operations can increase the level of bioaerosol in the ambient air close to the source by approximately 1,000 times above the background levels, these bioaerosol emissions from the source would reduce to background levels at approximately 150 to 500m downwind.



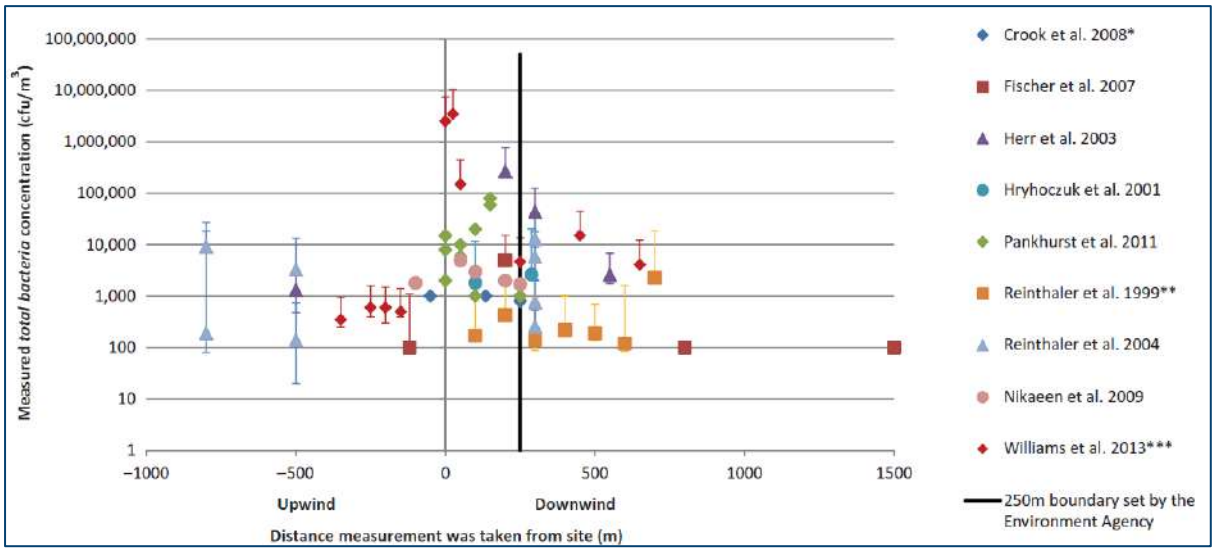
Source: **Sánchez-Monedero & Stentiford (2003)**

Figure 1: Concentrations of Aspergillus fumigatus recorded at different sites



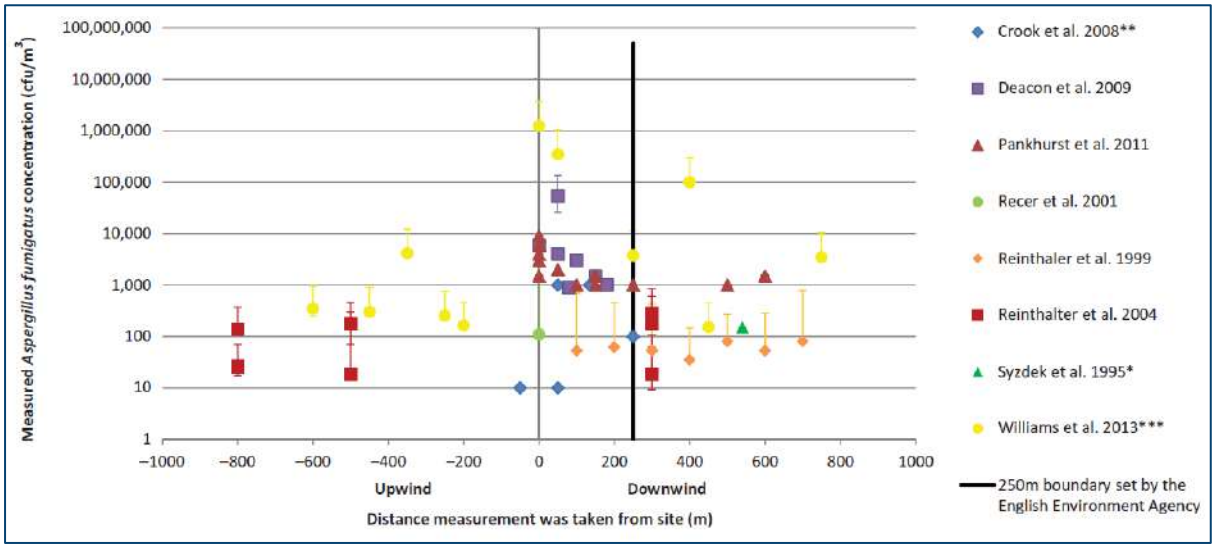
Source: **Sánchez-Monedero & Stentiford (2003)**

Figure 2: Concentrations of mesophilic bacteria recorded at different sites



Source: **Pearson et al (2015)**

Figure 3: Concentrations of airborne total bacteria concentrations near composting facilities from various studies



Source: **Pearson et al (2015)**

Figure 4: Concentrations of airborne Aspergillus fumigatus concentrations near composting facilities from various studies

Air dispersion modelling of bioaerosol

Air dispersion modelling of the bioaerosol from the Project operations was applied to determine the downwind dilution of particulate bioaerosol associated with the composting operations at the Project. An isopleth diagram showing the predicted dilution of emissions from the Project Site is presented in **Figure 5**.

It should be noted that in the modelling, activities such as shredding and turning are modelled to occur in every hour of the day, whereas in reality these activities occur for only a limited period during opening hours.

The results in **Figure 5** show a dilution of approximately 1,000 times in the emitted bioaerosols (in the gaseous form which have the most potential to travel further off-site) would most likely be achieved at a distance of approximately 200m from the source. The dilution increases to approximately 5,000 times (or five times below background) at the nearest poultry farm operation which is located approximately 0.5km to the north of the Project.

This indicates a margin of approximately fivefold in regard to the concentration of bioactive material from the Project in terms of colony forming units per cubic metre of air which may reach the nearest chicken farm. This additional factor is considered sufficient to address uncertainties inherent in any air modelling and measurement data for bioaerosols as reported in the various studies, for example as discussed by **Wéry (2014)**.

The results also show that bioaerosol levels from the Project would be several times below background levels at the nearest residential receptors.

These modelling results are consistent with the measured results in the available studies, suggesting that the level of bioaerosol generated from the Project would be close to background levels at a distance of approximately 200m from the source.

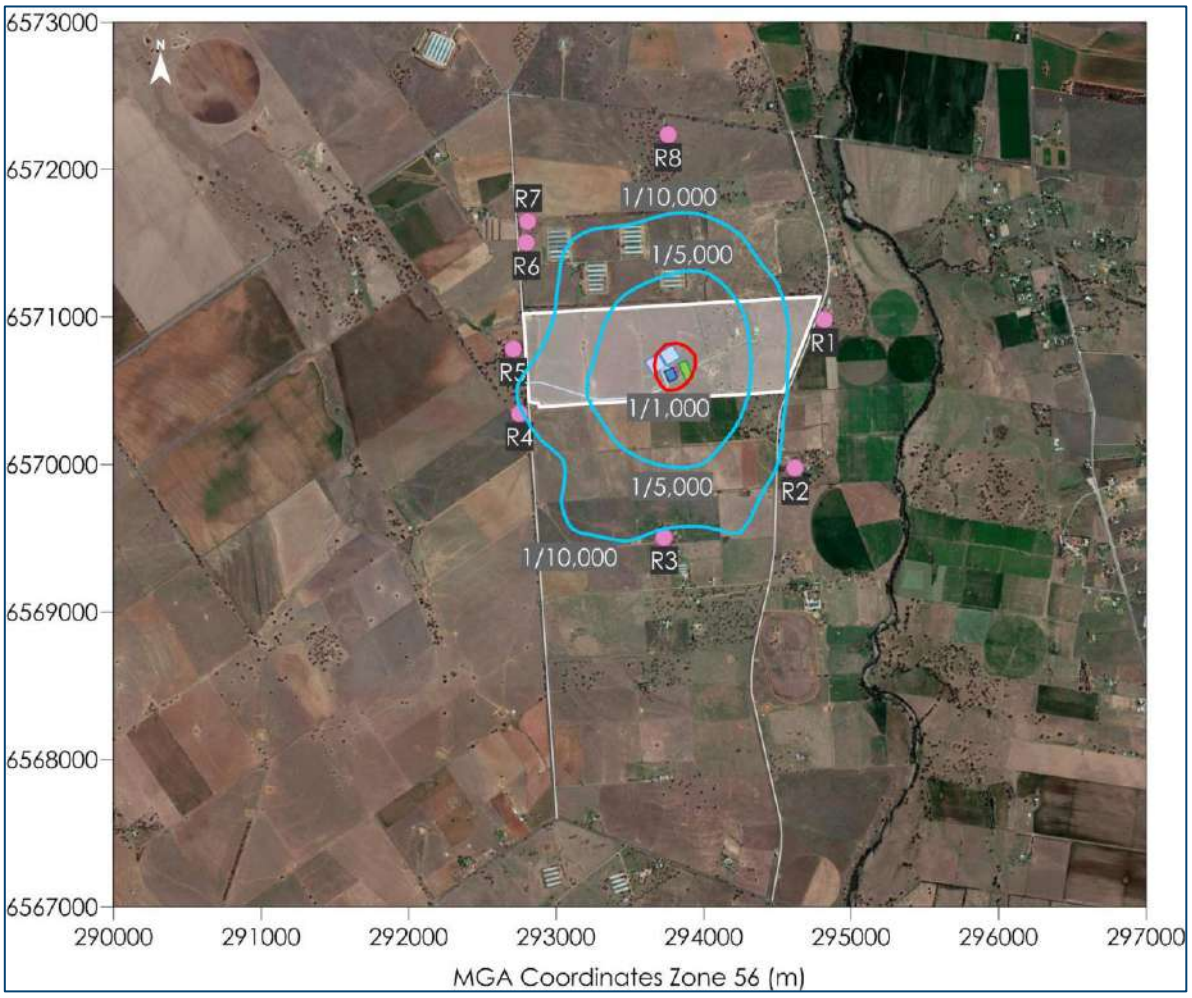


Figure 5: Dilution associated with a composting at the Project, red line indicates area where levels may be above typical background levels.

Discussion

A review of the available studies on bioaerosol generation at composting facilities shows that bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind where the bioaerosols would be diluted by approximately 1,000 times less than the level at the source.

The air dispersion modelling conducted for the Project shows that the levels of bioaerosols emitted by the Project would be diluted by approximately 1,000 times at a distance of approximately 200m and would thus be at background levels at this distance.

The results of the modelling assessment are consistent with the available research studies.

The nearby poultry farm is located approximately 0.5km from the Project Site. At this distance the bioaerosols due to the Project would be diluted approximately 5,000 times or more before reaching the poultry farm. This represents an approximate 5-fold or higher margin above the dilution level needed to bring the bioaerosols from the Project down to normal background levels, and indicates that there is sufficient separation distance between the composting facility and the farm.

Thus the nearest chicken farm is far enough from the Project to not experience any discernible impact from any bioaerosol emissions from the Project.

Similarly, the results also show that bioaerosol levels from the Project would be several times below background levels at the nearest residential receptors.

On the basis of the findings from our review of the available studies and the air dispersion modelling of the bioaerosol dilutions downwind from the Project, it is concluded that the Project would not cause any discernible bioaerosol impact at the nearby poultry farm, or at any dwelling.

Please feel free to contact us if you would like to clarify any aspect of this report.

Yours faithfully,
Todoroski Air Sciences

Aleks Todoroski

Philip Henschke

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Wéry, N. (2014)

"Bioaerosols from composting facilities – a review", Frontiers in Cellular and Infection Microbiology, 4 April 2014.

Desktop Wildlife Hazard Assessment

Appendix M

pitt&sherry

Desktop Assessment Report

Tunnel Composting Facility

August 2018

Tamworth Regional Council

AVISURE
safety | aviation | wildlife

Table of Contents

1. Introduction

1.1 Background

Tamworth Regional Council (TRC) proposed in 2017 to develop an Organics Recycling Facility (ORF) in close proximity (within 1km) of Tamworth Regional Airport (YSTW). TRC engaged Avisure to conduct a wildlife hazard assessment to review potential bird strike hazards posed to aircraft operations at YSTW (Avisure, January 2018). This hazard assessment resulted in the selected site being deemed unsuitable for this development and a new location was sought.

TRC has undertaken work to identify a new site for the ORF and also identified different technology (tunnel composting) which may be suitable to mitigate bird attraction. A site at Gidley has been selected, however, prior to progressing with a more detailed assessment, TRC has engaged Avisure to complete a desktop assessment of the proposed site and composting technology to determine if the operation would meet relevant standards related to wildlife hazards at YSTW.

1.2 Desktop Assessment

This desktop assessment aims to assess and review potential wildlife hazards posed to aircraft operations at YSTW by the ORF.

For this assessment, no field surveys were conducted, accordingly the assessment is based on knowledge obtained during previous surveys and review of relevant documents. This project did not include an airspace hazard assessment of the airport and surrounds. Further study requirements are identified in Section 3.

Despite these limitations, the desktop assessment addresses the scope which was to:

i. identify if the proposed site is likely to create a hazard to aircraft operations at and around YSTW

ii. identify surrounding habitats which may contribute to attraction of hazardous wildlife

iii. comment on the suitability of the Tunnel Composting technology

iv. provide guidance on the scope for further investigations with respect to the wildlife strike issue.

1.3 The Wildlife Strike Issue

The consequence of wildlife strikes with aircraft can be very serious Worldwide, in civil and military aviation, fatal bird strike incidents, have resulted in 450 human fatalities and 500 aircraft losses since aviation commenced (Thorpe 2016), most of those within the last 30 years. Bird strikes cost the commercial civil aviation industry an estimated US$1.2 billion per annum and involve more than just the repair of damaged engines and airframes (Allan 2002). Even apparently minor strikes which result in no damage can reduce engine performance, cause concern among aircrew and add to airline operating costs.

The main factors determining the consequences of a strike are the number and size of animal(s) struck, the phase of flight when struck and the part of the aircraft hit. Generally, the larger the animal, the greater the damage. Large animals have the ability to destroy engines and windshields and cause significant damage to airframe components and leading-edge devices. Strikes involving more than one animal (multiple strikes) can be serious, even with relatively small animals, potentially disabling engines and/or resulting in major accidents.

Historically, over 90% of reported strikes have occurred on or in close proximity to airports (International Civil Aviation Organisation 1999). Consequently, airports are the focus of management programs with the responsibility resting on airport owners and operators. It is, however, important that the whole airport community (including airline operators) and surrounding land managers are aware of wildlife strike as an issue and that all stakeholders become involved in the process of reducing the hazard. Effective management of wildlife-attracting land uses adjacent to airports is imperative.

2. Desktop Assessment

2.1 Summary of Literature Review

Avisure reviewed literature relevant to the wildlife hazards associated to developments in the vicinity of an airfield. For further details of relevant regulations and guidance material refer to appendix A.

A summary of relevant excerpts of legislations and guidance documents is included below:

International Civil Aviation Organization (ICAO) Annex 14 Vol 1. 6th Ed. 2013

"The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. Where the elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable."

ICAO Document 9184 Airport Planning Manual: Land Use and Environmental Control

"Any land use that has potential to attract birds to the airport vicinity should be subject of a study to determine the likelihood of bird strikes to aircraft using the airport."

ICAO Airport Services Manual Doc 9137 4th Ed. 2012

Refuse facilities that accept putrescible (organic) wastes are highly attractive to various bird and mammal species that are hazardous to aviation. Generally, it is desirable that sites be no closer than the 13 km radius from the airport and, in some cases, further —where studies of flightlines of birds attracted to these sites prove them problematic for the airport.

Fully enclosed waste-transfer facilities generally will not attract hazardous wildlife.

"For any new off-airfield developments being proposed that may attract birds or flight lines across the airport, it is important that the airport operator be consulted and involved in the planning process to ensure that its interests are represented."

International Bird Strike Committee (IBSC) Recommended Practices No. 1 Standards for Aerodrome Bird/Wildlife Control, 2006

Standard 9

Airports should conduct an inventory of bird attracting sites within the ICAO defined 13km bird circle, paying particular attention to sites close to the airfield and the approach and departure corridors. A basic risk assessment should be carried out to determine whether the movement patterns of

birds/wildlife attracted to these sites means that they cause, or may cause, a risk to air traffic. If this is the case, options for bird management at the site(s) concerned should be developed and a more detailed risk assessment performed to determine if it is possible and/or cost effective to implement management processes at the site(s) concerned. This process should be repeated annually to identify new sites or changes in the risk levels produced by existing sites."

The National Airports Safeguarding Framework (NASF) Guideline C

The National Safeguarding Framework identifies organic waste and putrescible waste facilities as a high wildlife attraction risk and are considered incompatible within 3km of an airport, must be mitigated within 8km and monitored within 13km.

2.2 Desktop Site Assessment

TRC has identified a potential site at 284 Gidley Appleby Road, Gidley NSW, which is located 10km North of YSTW (Figure 1). The proposed site is in a rural area, the majority of surrounding land uses are agricultural including cropping, livestock grazing and poultry production. Wildlife surveys of the site and surrounds have not been conducted. It is likely the immediate areas surrounding the site pose some attraction to wildlife that may be a hazard to aircraft operations, however given the distance of the site from YSTW it is unlikely this area contributes significantly to the current hazard levels at the airport.

A large number of attractive habitats surround YSTW (Figure 1), it will be important to ensure ORF site once developed does not increase hazards by supporting populations of hazardous birds or by drawing birds from existing habitats through YSTW airspace.

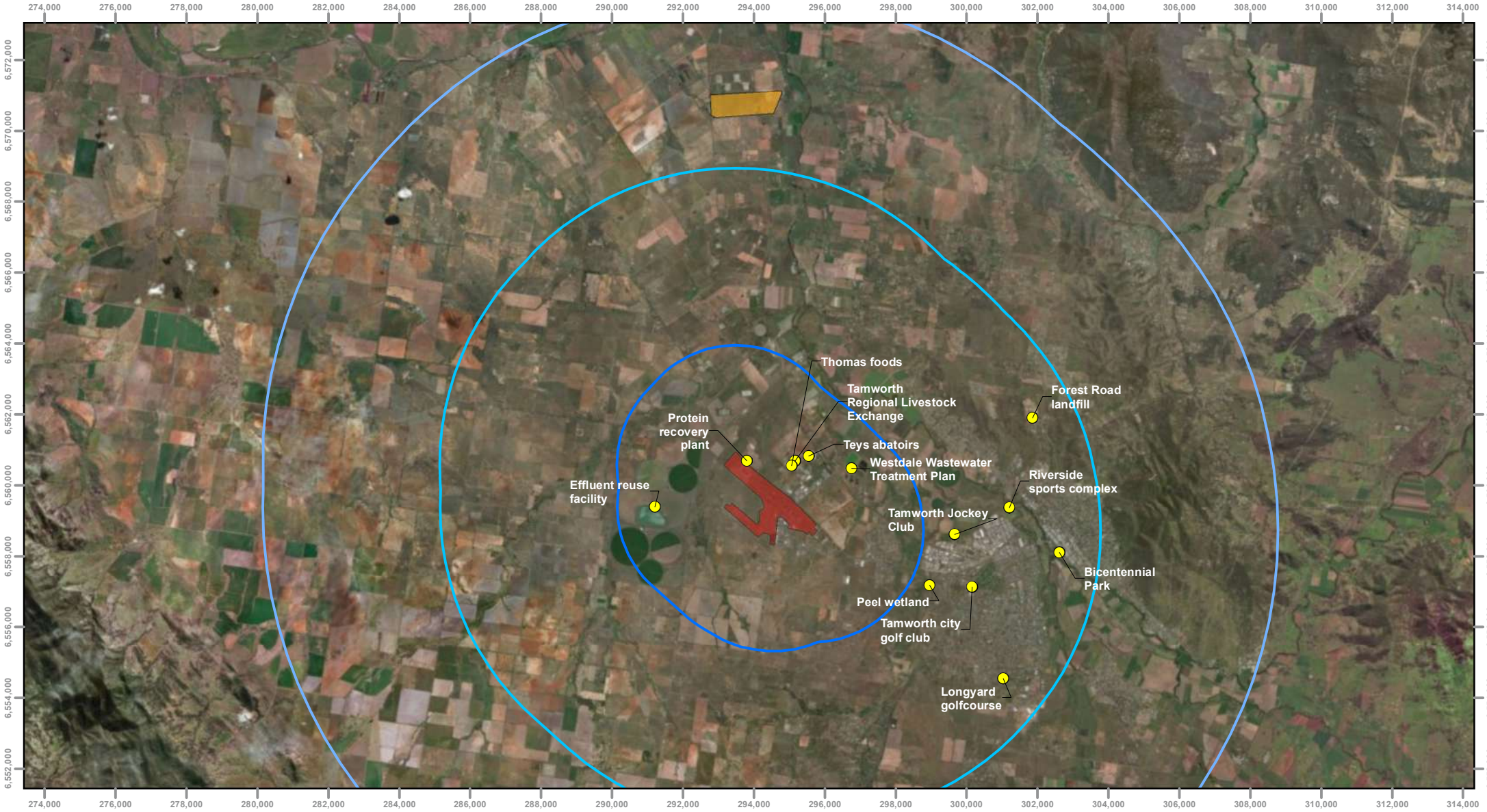

Figure 1: Proposed organic recycling facility and off-airport locations

Tamworth Regional Council

Organic recycling facility
desktop assessment

13km Buffer
8km Buffer
3km Buffer
Proposed ORF Site
Tamworth Regional Airport

AVISURE
safety | aviation | wildlife

Job number: PR3838
Revision: 2
Author: AJS
Date: 28/08/2018

0 0.5 1 2 3 4
Kilometers

GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

Data Sources: Avisure, 2018; Image: Nearmap 2018 and ESRI: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PR3838_MPX_OffAirport
A4

2.3 Composting Process

TRC has identified Tunnel Composting technology as a method to potentially reduce wildlife attraction. Tunnel composting relies on aerobic composting, using a forced air supply into fully enclosed self-contained “tunnels” which are surrounded by a receival shed with automated fast closing doors. Composting material remains inside the tunnels for 28 days, then moved outside for maturation and storage, by which stage, the material is expected to be inert and not attractive to wildlife.

Figure 2. Example of self-contained tunnel composting unit. (Image source http://www.apbtc.com.au/ accessed on 16/08/2018).

Figure 3. Example of composting plant (Image source Image source http://www.apbtc.com.au/ accessed on 16/08/2018). Note: TRC facility would be fully enclosed.

3. Recommendations and Further Studies

Although the site will receive putrescible waste and is within the 13km buffer zone of the airport, it is unlikely to create additional hazards to aircraft at YSTW provided that the tunnel composting and receival shed are enclosed. However further investigations and mitigation measures outlined below are required prior to approval and operation.

The following requirements should be included in the further studies:

- A site inspection and baseline surveys to identify populations of hazardous wildlife at and around the site.
- An aeronautical study to assess aviation airspace risks and consultation with Tamworth Regional Airport management to review and comment on potential conflicts and determine requirements for any hazard warnings or notifications.
- Review of infrastructure design to minimise bird access and nesting/roosting opportunities. For example; building eaves and internal structures can provide shelter and nesting platforms for birds.
- Confirmation that processed material is inert and does not include food sources for hazardous birds following the initial 28-day composting period.
- Determine monitoring and management actions for the operational phase of the site. Including requirements for: site cleanliness, threshold numbers of birds, managing spillage from trucks entering the enclosed facility, redundancies if there is an equipment failure, processed material attracting unacceptable numbers.

4. References

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Appendix A Regulation and Guidance

There are a number of national and international requirements and guidance documents that indicate land use in the vicinity of an airport can contribute significantly to the wildlife hazard levels and safety of aircraft operations. Relevant documents were reviewed and outlined in this section.

National Regulations and Standards

Work Health and Safety Act 2011

Section	Guideline
19	Primary Duty of Care: (2) A person conducting a business or undertaking must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.

Damage by Aircraft Act 1952

Section	Guideline

10	• Imposes strict and unlimited liability
	• Applies if a person or property on land or water suffers personal injury, loss of life, material loss, damage or destruction caused by:
	  ○ Impact with aircraft in flight
	  ○ Impact with aircraft that damaged or destroyed while in flight
	  ○ Impact with persons, animal or thing that dropped or fell from aircraft in flight
	  ○ Something that is a result of (1), (2) or (3)
	• If the act is applied, the owner or operator of the aircraft are jointly and severally liable.
	Damages are recoverable under the Damage by Aircraft Act without proof of intention or negligence.

The National Airport Safeguarding Framework

In May 2012, the Department of Infrastructure and Transport (DIT)[1] released the National Airport Safeguarding Framework (NASF). The NASF aims to develop informed land use planning regimes to safeguard airports and their adjacent communities.

Guideline C of NASF, *Managing the Risk of Wildlife Strikes in the Vicinity of Airports*, aims to provide guidelines to land users and planning decision makers regarding the management of wildlife hazards. Adhering to the ICAO guidelines relating to radial distances from airports (i.e. 3 km, 8 km and 13 km), the NASF allocates risk categories to incompatible land uses from very low to high and recommends actions for both existing and proposed developments (i.e. incompatible, mitigate, monitor, no action). The NASF encourages a coordinated approach between airport operators and land use planning authorities to mitigate risks, and where risks are identified for new developments, the NASF recommends:

- developing a management program
- establishing management performance standards
- allowing for design changes and/or operating procedures where the land use is likely to increase the strike risk
- establishing appropriate habitat management
- creating performance bonds should obligations not be met
- monitoring by airport authorities
- reporting wildlife events as per Australian Transport Safety Bureau (ATSB) requirements.

Relevant sections of Guideline C are presented in Table 1.

[1] Now the Department of Infrastructure, Regional Development and Cities

Table 1. Relevant sections of NASF Guideline C.

Section	Guideline
21	Land use planning authorities should ensure that airport operators are given adequate opportunity to formally comment on planning applications for new or revised land uses that fall within the guidance provided in Table 2. Airport operators will be expected to respond with comments on how the proposed changes to land use might increase the risk of wildlife strike and on any regulatory actions that could increase the risk of wildlife strike, such as permits related to land uses of concern.
24	Where local authorities seek to establish land uses which may increase the risk of wildlife strike near existing airports, steps should be taken to mitigate risk in consultation with the airport operator and qualified bird and wildlife management experts.
27	There would be safety benefits if airport operators and land use planning authorities follow a common, coordinated approach to managing existing wildlife hazards at, and within the vicinity of, airports. Managing wildlife attractants is a key strategy in discouraging wildlife on and around airports.

The National Safeguarding Framework identifies organic waste and putrescible waste facilities as a high wildlife attraction risk and are considered incompatible within 3km of an airport, must be mitigated within 8km and monitored within 13km (Table 2).

Table 2. National Airports Safeguarding Framework Guideline C: Managing the Risk of Wildlife Strikes in the vicinity of Airports.

Land Use	Wildlife Attraction Risk	Actions for Existing Developments			Actions for Proposed Developments/ Changes to Existing Developments		
		3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)
Agriculture							
Turf farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Piggery	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing /packing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Cattle /dairy farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Poultry farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation							
Wildlife sanctuary / conservation area - wetland	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife sanctuary / conservation area - dryland	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation							
Showground	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Racetrack / horse riding school	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, etc)	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park / Playground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic / camping ground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial							
Food processing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Warehouse (food storage)	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Fast food / drive-in / outdoor restaurant	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Office building	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel / motel	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Car park	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities							
Food / organic waste facility	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Non-putrescible waste facility - landfill	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

The Tamworth Regional Council Local Environmental Plan 2010

Section	Guideline
7.4	Development in flight path (1) The objectives of this clause are: (a) to provide for the effective and on-going operation of the Tamworth Airport, and (b) to ensure that any such operation is not compromised by proposed development in the flight path[2] of that airport.

Section 117(2) of the NSW Environmental Planning and Assessment Act 1979

Section	Guideline
3.5	(1) The objectives of this direction are: (a) to ensure the effective and safe operation of aerodromes, and (b) to ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity.

The NSW Environment Protection Agency, Waste Classification Guidelines, Part 1: Classifying waste

Section	Guideline
Step 6	Non-putrescible materials typically do not: • readily decay under standard conditions • emit offensive odours • attract vermin or other vectors (such as flies, birds and rodents). Wastes that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forestry and crop materials, and natural fibrous organic and vegetative materials.

[2] Note: ICAO regard animals and flocks of birds as an obstruction with regard to runway operations.

International Regulations and Standards

International Civil Aviation Organization

The ICAO defines aerodrome standards for wildlife hazard management at civilian airports. Tables 3 and 4 summarise the standards relevant to the proposed ORF.

Table 3. Sections of ICAO Annex 14 Vol 1. 6th Ed. 2013 relevant to the proposed ORF.

Section	Requirement
9.4.3	Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.
9.4.4	The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a wildlife hazard problem. Where the elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.
9.4.5	States should give due consideration to aviation safety concerns related to land developments in the vicinity of the aerodrome that may attract wildlife.

Table 4. Sections of ICAO Airport Services Manual Doc 9137 4th Ed. 2012 relevant to the ORF.

Section	Requirement
4.5.1	Airports should systematically review features on, and in the vicinity of, the airport that attract birds/wildlife. A management plan should be developed to reduce the attractiveness of these features and to decrease the number of hazardous birds/wildlife present or to deny them physical access to these areas.
4.5.2	Airport development should be designed such that it will not be attractive to hazardous birds/wildlife and no attraction will be created during construction. This may include denying resting, roosting and feeding opportunities for hazardous birds/wildlife.
4.5.6	Water bodies in many parts of the world can be a particular hazard because they can be very attractive to birds. It may be possible for these to be modified by netting them to exclude birds, fencing them to deny access to birds that walk in, have the sides steepened or made less attractive in other ways.

4.7.3	For any new off-airfield developments being proposed that may attract birds or flight lines across the airport, it is important that the airport operator be consulted and involved in the planning process to ensure that its interests are represented.
7.3	Surface water is often highly attractive to birds. Exposed water should be eliminated or minimized to the greatest extent possible on airport property as follows: a) *Depressions and water bodies*. Pits or depressions that fill with water after rains should be levelled and drained. Larger water bodies, such as storm-water retention lagoons, can be covered with wires or netting to inhibit birds from landing. Larger water bodies that cannot be eliminated should have a perimeter road so that bird/wildlife-control personnel can quickly access all parts of the water body to disperse birds. Water bodies and ditches should have steep slopes to discourage wading birds from feeding in shallow water.
7.4.1	Much care must be taken when selecting and spacing plants for airport landscaping. Avoid plants that produce fruits and seeds desired by wildlife. (Plant selection is also an important consideration for off-airport location in term of wildlife attraction).

World Birdstrike Association

Published under the World Birdstrike Association's (WBA) previous name, the International Bird Strike Committee (IBSC), the Best Practice Standards for Airport Bird/Wildlife Control states, "Controlling the attractiveness of an airport to birds and other wildlife is fundamental to good bird control. Indeed, it is probably more important than bird dispersal in terms of controlling the overall risk." (Table 5).

Table 5. Section of the IBSC Best Practice Standards relevant to the proposed ORF.

Section	Requirement
Standard 2	An airport should undertake a review of the features on its property that attract hazardous birds/wildlife. The precise nature of the resource that they are attracted to should be identified and a management plan developed to eliminate or reduce the quantity of that resource, or to deny birds' access to it as far as is practicable.

Federal Aviation Administration

The United States Federal Aviation Administration (FAA) has no jurisdiction over Australian aerodromes; however, they provide critical guidance on composting operations and water body management in Advisory Circular AC 150/5200-33B:

- **Composting operations on or near airport property.** Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any Air Operation Area (AOA) or the distance called for by airport design requirements (see AC 150/5300-13, Airport Design). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic.
- **New storm water management facilities.** The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow and linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

Revision History

Rev. No	Rev. Date	Details	Prepared by	Reviewed and Approved by
00	29/08/2018	Desktop assessment	Will Jamieson Principal Biologist	Phil Shaw Managing Director

Distribution List

Copy No.	Date	Format	Issued to	Name
1	29/08/2018	E-copy	Tamworth Regional Council	Megan Mather
2	29/08/2018	E-copy	Avisure	Administration

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Site Water Balance

Appendix N

pitt&sherry

pitt&sherry

Tamworth Organic Recycling Facility Water Balance Model

Site Water Balance

Prepared for

Tamworth Regional Council

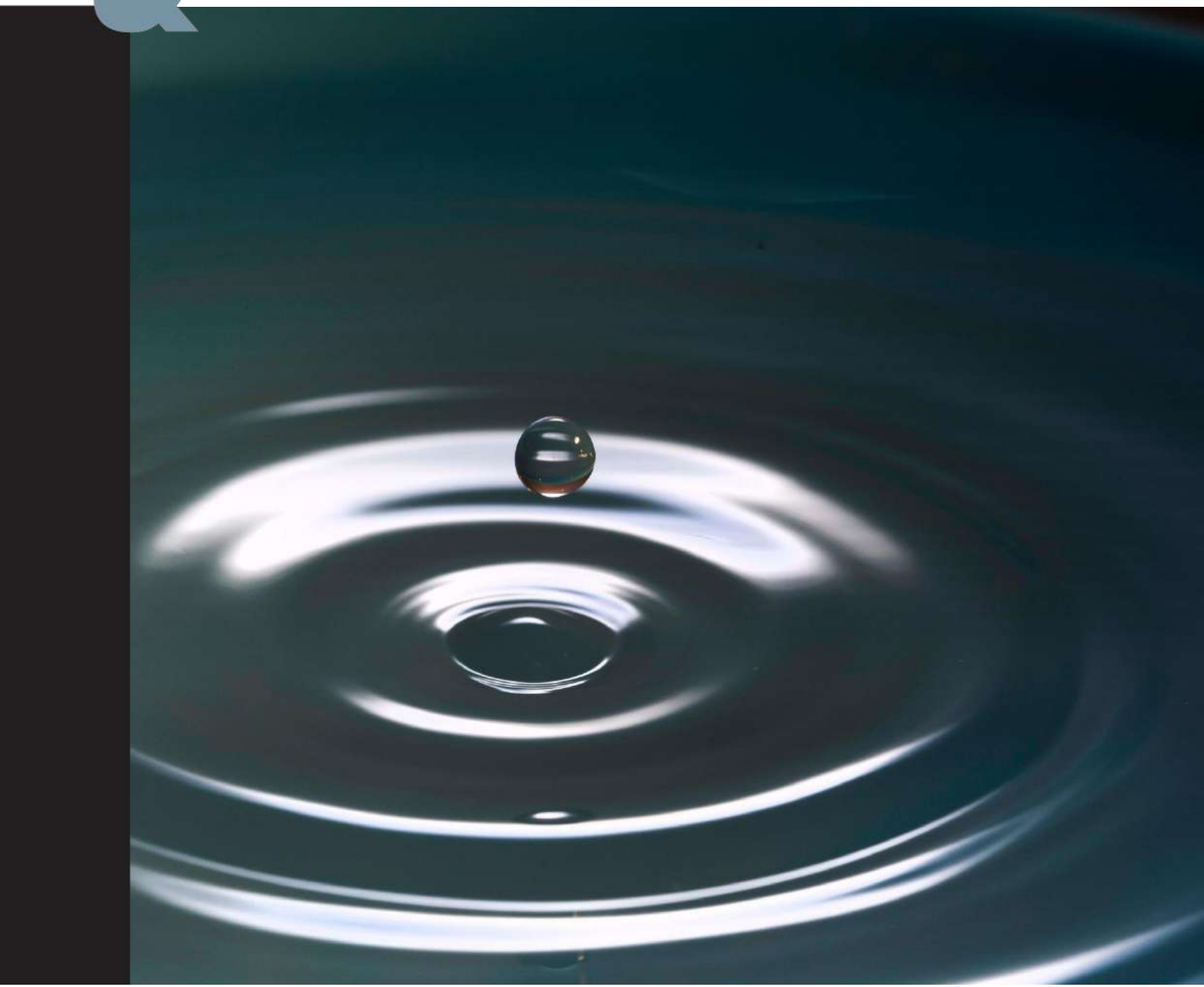
Client representative

Megan Mather

Date

13 September 2019

Rev01



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Prepared by — Amir Hedjripour/Zuzanna Graszkiewicz		**Date — 11/09/2019**
Reviewed by — Haydn Betts/Adam Bishop		**Date — 11/09/2019**
Authorised by — Jessica Berry		**Date — 11/09/2019**

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft for internal review	AH	HB	HB	12/07/2019
00	Draft for client	ZG	AB	JB	11/09/2019
01	Final	ZG	AB	JB	13/09/2019

1. Introduction

Tamworth Regional Council (TRC) proposes to construct and operate an organic recycling facility (ORF) on Gidley – Appleby Road in Tamworth, NSW. A Development Application is to be submitted for the proposed facility, which will be accompanied by an Environmental Impact Statement (EIS). In accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued for the proposal, the EIS must include water balance modelling of the proposed operations.

This report has been prepared to support the EIS and as such the EIS should be referred to for a detailed project description and summary of existing environment.

1.1 Report objectives

The site water balance has been developed to address the requirements of SEAR No. 1340 through:

- Assessment of site water budget and design of water management system.
- Assessment of changes to water transfers, catchments and operational conditions that may occur for approved conditions.
- Documentation of the predicted annual values of the water transfers within the site operations, as well as the effect of rainfall variability on annual water transfers.

Further assessment of the hydrological and groundwater conditions at the Site have been outlined within the EIS.

1.2 Scope of work

The following tasks have been undertaken to develop the site water balance:

- Collate and review existing data relating to the Site.
- Establish an understanding of the water demands and management system at the site.
- Ascertain adequate water availability and any external water supply requirements.
- Determine capacities of water storage facilities to manage leachate in a one in ten year (24hr) rain fall event.
- Develop a water cycle schematic for the water interactions within the site water management system.
- Develop a GoldSim water balance model for the site that can assess the water management system under various rainfall patterns.

1.3 Site Details

As outlined within the EIS, the facility has been designed to minimise surface water mixing with the organics received and the composting process to be undertaken on the Site. Any surface water that comes in to contact with the processing and/or maturation and storage areas, or that has been contaminated by leachate, is handled in the same manner as leachate. Within this report this water is referred to as Process water.

The Site has been designed to include three separate drainage systems:

- Stormwater Diversion – clean stormwater from areas surrounding the Site will be diverted to the existing Stormwater Dams on Site to align with existing Site conditions and separate it from process areas within the Site
- Non-Process Water System – stormwater from non-process areas within the Site will drain into the existing Stormwater Dams

- Process Water System – stormwater and run-off from process areas within the Site will drain into a Leachate Dam

All leachate run-off generated will drain to the leachate dam under gravity. The leachate dam has been nominally sized to accommodate up to 16ML as per the results of the water balance and this report. It is noted that the water balance would be further refined during detailed design and this may result in review of the leachate dam size.

The leachate dam structure will lined to prevent leachate from leaking through the base to groundwater. Liner design would be undertaken during detailed design, and may consist of a clay or modified soil liner consisting of at least 900mm thick of recompacted clay with an in-situ permeability of 10^{-9} ms-1, or an alternative liner providing a similar level of protection such as synthetic (plastic) material. The leachate management system is designed in accordance with the NSW EPA's Environmental Guidelines for Composting and Related Organics Processing Facilities (DEC 2004; the "EPA Guidelines").

Water inputs to the Site include:

- Rainfall
    - Roof runoff (directed to rainwater tanks)
    - General runoff (directed to stormwater or leachate dam systems)
    - Dam surface direct rainfall
- Moisture component of incoming waste/feedstock
- Bore Water (make-up water for operations)

Water demands (and losses) during operation of the Site include:

- Potable water (low use, amenities, drinking etc)
- Operational water including for
    - Dust management
    - General cleaning
    - Wheel wash system
- Tunnel composting moisture control (sprinklers) and biofilter loop demands
- Process water for moisture control during maturing processes
- Dam surface evaporation.
- Compost evaporation.

Note that for simplicity, minor operational water requirements associated with wheel wash requirements have not been included in the Water Balance. The wheel wash system will be a fully contained truck wash system with water recycling capability. This wheel wash is estimated to use on average 100L of water per large truck washed and has a 5,000L tank with submersible pump. The top up requirement for this tank are estimated by one manufacturer as up to 2,000L per day for an assumed twenty (20) trucks. The wheel wash is topped up from rainwater in the first instance, and bore water if required.

2. Site Hydrology

The proposed organic recycling facility is located approximately 15km north of Tamworth in the Peel River basin. The closest Bureau of Meteorology weather station to the project site is the Somerton (Bective Estate) Station (Station No. 055003), approximately 10 km west of the Site, with recorded rainfall data for the period 1882-2019, including 17 years of missing data. Climate data for Somerton is assumed to present a good analogue for the climate at the Site.

Based on the historical rainfall records of Somerton (Bective Estate) Station, the minimum, mean and maximum annual precipitations at the site are 284mm, 611mm and 1,121mm, respectively. On average, and based on the historical records, January is the wettest and April is the driest month. Figure 1 presents mean monthly rainfall depths based on Somerton historical data. Figure 2 presents the historical annual rainfall depths at Somerton between 1882 and 2018.

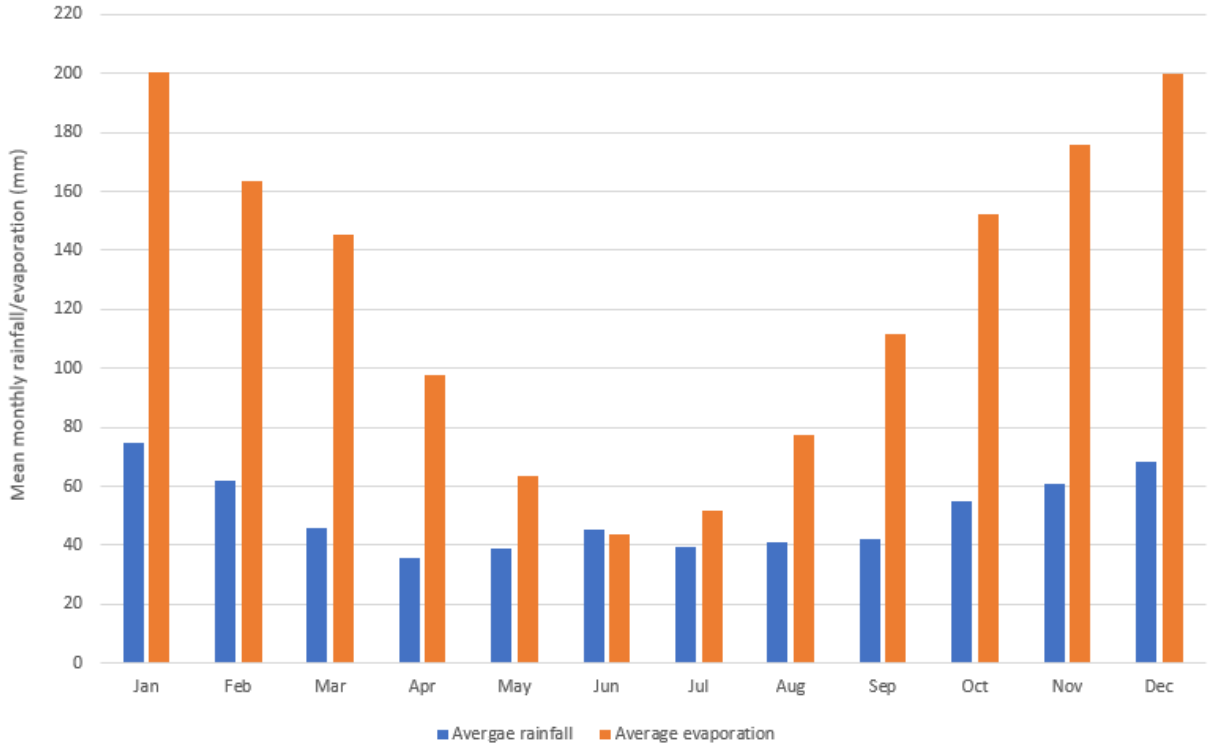

Figure 1 Site mean monthly rainfall at Somerton Station (1882-2018, BoM) and evaporation (1889-2018, SILO Data Drill)

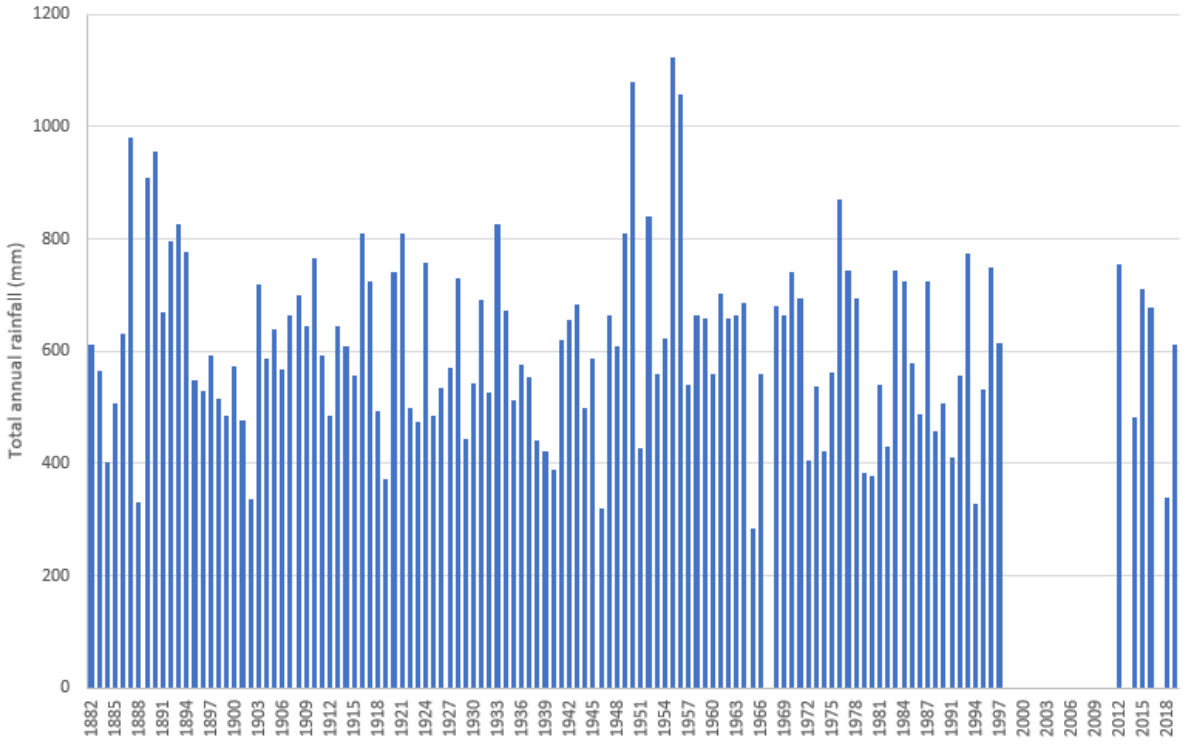

Figure 2 Historical annual rainfall depths at Somerton Station (1882-2018).

Average monthly evaporation data are also shown in Figure 1 and is based on the SILO database Data Drill (Queensland Government). The SILO database is hosted by the Queensland Department of Environment and Science and provides national coverage of daily climate variables convenient for use across all states. There is an appreciable moisture deficit (evaporation exceeds rainfall) across the year, the deficit being greatest in summer.

Rainfall intensity-frequency-duration data for the site were also downloaded from the Bureau of Meteorology and summarised in Table 1.

Table 1 Rainfall intensity-frequency-duration data (rainfall intensities in mmh^{-1})

	Annual Exceedance Probability (AEP)						
Duration	**0.632**	**50%**	**20%**	**10%**	**5%**	**2%**	**1%**
1 min	110	124	170	202	234	277	312
2 min	93	104	141	168	196	232	260
3 min	86.2	96.7	131	156	182	215	241
4 min	81	91.1	124	147	171	202	227
5 min	76.5	86.2	118	140	162	191	215
6 min	72.5	81.9	112	133	154	182	204
10 min	60.1	68.1	93.4	111	128	152	171
15 min	49.8	56.4	77.5	92.1	107	127	143
20 min	42.8	48.4	66.5	79.1	91.7	109	123
25 min	37.6	42.5	58.4	69.5	80.6	96	108
30 min	33.7	38.1	52.2	62.1	72.1	85.9	96.7
45 min	26	29.3	40	47.6	55.4	65.9	74.2
1-hour	21.5	24.1	32.8	39	45.4	53.9	60.7
2-hour	13.3	14.9	20.1	23.7	27.5	32.5	36.6
3-hour	10	11.2	15	17.7	20.4	24.1	27.1
4.5-hour	7.56	8.44	11.3	13.2	15.2	17.9	20.1
6-hour	6.19	6.91	9.2	10.8	12.4	14.6	16.3
9-hour	4.67	5.21	6.94	8.14	9.33	11	12.3
12-hour	3.81	4.26	5.68	6.67	7.66	9.05	10.1
18-hour	2.85	3.19	4.27	5.04	5.82	6.91	7.77
24-hour	2.31	2.58	3.48	4.12	4.79	5.71	6.45

3. Surface Water Management System

The generalised water flow diagram of Tamworth ORF is presented in Figure 3.

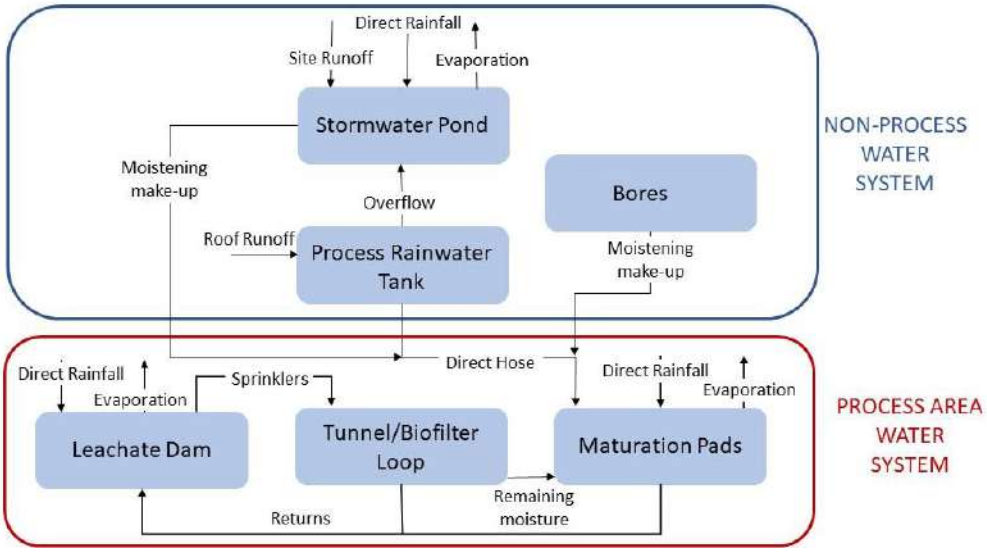

Figure 3 Site water balance schematic

The process and non-process water systems are explained further below.

3.1 Non-Process Water System

3.1.1 Stormwater Dam

The Site currently contains two existing stormwater dams previously used for agricultural purposes. The current estimated catchment area reporting to these is approximately 20Ha, of which 4.66Ha has been converted to Process Area and would be diverted to the Leachate Dam. The remaining area of 15.34Ha would remain as cleared pasture land and would continue to follow drainage patterns similar to existing via the existing stormwater dams.

These stormwater dams will continue to capture stormwater surrounding the Site as well as capturing runoff from non-process areas within the ORF Site, i.e. “clean” water. These dams may be used to supply water throughout the site in accordance with the harvestable rights provisions of the Water Management Act 2000. The aggregate capacity of all dams on the property has been determined to be within the allowed harvestable rights capacity for the Site (refer to the EIS for further description).

The stormwater dams are estimated to have a combined storage volume of 2,400m^3 and a maximum combined surface area of 1,600m^2. The stormwater dams capture only non-process area runoff and are allowed to overflow freely downstream. They are not sized or managed to provide a water quality control or detention function, therefore sizing of these dams is relevant only for consideration of storage capacity and water security.

The stormwater dams provide water that is suitable for watering the maturation pads where rainwater tank supply is insufficient. This water is also suitable for watering vegetation established on the Site. Additional exploration of beneficial uses of this water should be undertaken and incorporated into the water balance during detailed design.

3.1.2 Rainwater Tanks

Rainwater from building roofs will be captured into tanks within the ORF Site as outlined in Table 2.

Table 2 Location, runoff area and volume of site rainfall tanks

Location (building roofs)	Total **Area (m^2)**	Total **Tank volume** (m^3)
Process building and biofilter	4,715	300
Equipment shed	840	300
Office	160	20

By far the largest building roof is the process building. Only the rainfall tank capturing runoff from the process building and biofilter has been included in the water balance modelling at this stage. This provides priority water for the moistening demand of the Maturation Pads. The other tanks will be used for office area and wheel wash demands and have been sized to supply these demands outside of the water balance model.

3.1.3 Bores

There are two existing bores on the property, one of which has been deemed suitable for use to meet operational demands of the facility where rainfall and leachate stormwater does not suffice.

This bore is located south east of the ORF Site and could support extraction up to 6,000 m^3 per year. It is proposed to use bore water for maturation pad moisture make-up when required to augment the rainwater tank water.

The bore is currently licenced for stock and domestic purposes. The license would be amended if required to enable use for industrial purposes.

3.2 Process Area Water System

3.2.1 Maturation Pads

After the tunnel composting process, the pasteurised compost is placed on Maturation Pads in windrows for further composting. Water must be added to the compost windrows to maintain optimum moisture conditions for the composting process. This requires moisture addition on most days, though during rain there may be no need for make-up water.

The maturation pad water demand has been set to an average daily rate equivalent to 5,000m^3 per year (13.7m^3/d) on days where the rainfall is less than 5mm. For days where the rainfall is greater than 5mm, no additional water is required for the maturation pads.

Make-up water for maturing compost is to be clean water sourced from the rainwater tanks, stormwater dam or bore water in the event there is not sufficient water from these other preferred sources.

Any rainfall runoff or leachate generated by surplus watering of compost on the Maturation Pad, is to be treated as “leachate” and captured by the Leachate Dam. For the purposes of modelling the runoff from the Maturation Pads, 25% of the area has been assumed to be occupied by compost windrows and 75% is assumed to be vacant hardstand area. This reflects the large buffer distances established on the maturation pad to meet the Fire Safety Guidelines for Waste Facilities. The total surface area of the Maturation Pads is approximately 21,000m^2.

3.2.2 Tunnel and Biofilter Loop

Water is applied to composting material in the tunnels to maintain optimum moisture content and is also applied to the biofilter loop. Water supply to the tunnels and biofilter loop is maintained via sprinkler systems. Recycled water from the leachate dam is to be used in both cases, where available, and would be made up with stormwater or bore water if needed. This demand is set at a constant 5000m^3/yr.

3.2.3 Leachate Generation and Leachate Dam

The leachate dam collects the following:

- Overflow leachate from the tunnels and condensate from associated ductworks (referred together as process water). A small (70kl nominal) tank is proposed for capturing and reusing this water source within the tunnels. Rarely this tank may overflow and water would be directed to the leachate dam. Volume would be minimal.

- Rain fall runoff and leachate return from the maturation pads via the leachate drainage system. This includes any excess water 'sprayed on the maturing compost that does not get absorbed by the compost or evaporated. For the purposes of modelling we have currently assumed that 50% of the potential moisture loss from air-drying compost is returned to the leachate dam as leachate. This is very conservative, as almost all of the loss will be to atmosphere via evaporation.

- Runoff from process areas where there is potential contact with organic or composting materials. This includes the hardstands and roads surrounding the process building.

The estimated process area of the site that generates leachate is estimated as 34,600 m^2 which includes:

- Roads (8,000 m^2).
- Maturing pads (21,000 m^2).
- Concrete apron in front of the process building (1,200 m^2).
- Other areas around the process building (4,400 m^2).
- Direct rain water falling on the leachate dam surface(11,200 m^2).

The leachate dam supplies water for the tunnel and biofilter loop demand.

4. Modelling representation

The water balance model for the Tamworth ORF was developed using GoldSim Version 11.1 (GoldSim Technology Group, 2016). This software is a graphical object-oriented system for simulating either static or dynamic systems. It is like a 'visual spreadsheet' that visually represents data and equations. The model was produced by representing the water cycle as a series of elements, each containing pre-set rules and data, that were linked together to simulate the interaction of these elements within the water cycle. The water cycle was simulated over time in GoldSim and selected outputs from the modelled system were statistically summarised.

4.1 Time Steps and Simulation Timeline

The GoldSim model simulates the water cycle using daily time steps. Daily time steps were used for the modelling as daily rainfall data was the shortest period of data available and changes in operational conditions are typically made on a daily (or shorter) basis.

4.2 Probabilistic Modelling

Daily rainfall and evaporation data for the site were derived from the SILO database (Queensland Department of Environment and Science) for the period 1889-2018. SILO is an enhanced and convenient to use climate data bank based on historical climate data from 1889 provided by the Commonwealth Bureau of Meteorology. Records are mainly based on observed data from around Australia, with interpolation where there are data gaps.

The simulation was run for 110 'realisations', where each realisation represented a single model run of 20 years. Each realisation modelled a different continuous historical rainfall pattern of 20 years from the full series of 130 years of SILO data.

One hundred and thirty years of rainfall data provides 110 rainfall patterns as the seasonality in rainfall is maintained for each model run, e.g. the 1st January in the model was simulated with 1st January historical rainfall data. For each realisation, a continuous pattern of historical rainfall was applied over the simulation timeline. Where the end of the continuous historical rainfall record was reached in a realisation, the rainfall looped back to the start of the rainfall record.

4.3 Rainfall-runoff modelling

To estimate the runoff contributing to the surface water storages at the site, the Australian Water Balance Model (AWBM) was incorporated into the wider water balance model. The AWBM was adopted as the most suitable model as it is widely used throughout Australia, has been verified through comparison with large amounts of recorded streamflow data and literature is available to assist in estimating input parameters based on recorded streamflow data (Boughton and Chiew, 2003). Another advantage of the AWBM is the consideration of soil moisture retention when determining runoff.

The AWBM is a catchment water balance model that calculates runoff from rainfall after allowing for relevant losses and storage. As seen in Figure 4, the model consists of three storages representing factors such as infiltration into the soil. Rainfall initially enters these storages and once a storage element is full, any additional rainfall is considered to be excess rainfall. Of this excess rainfall, a proportion is routed to the groundwater/baseflow storage (BS) while the remainder is routed to the surface storage (SS). The discharge from the baseflow storage and surface storage is estimated as a proportion of the volume of the storages at the end of each day. The total daily runoff is equal to the combined volume of water discharged from these two storages. The AWBM model parameters were adopted from literature and previous experience from similar areas as summarised in Table 3.

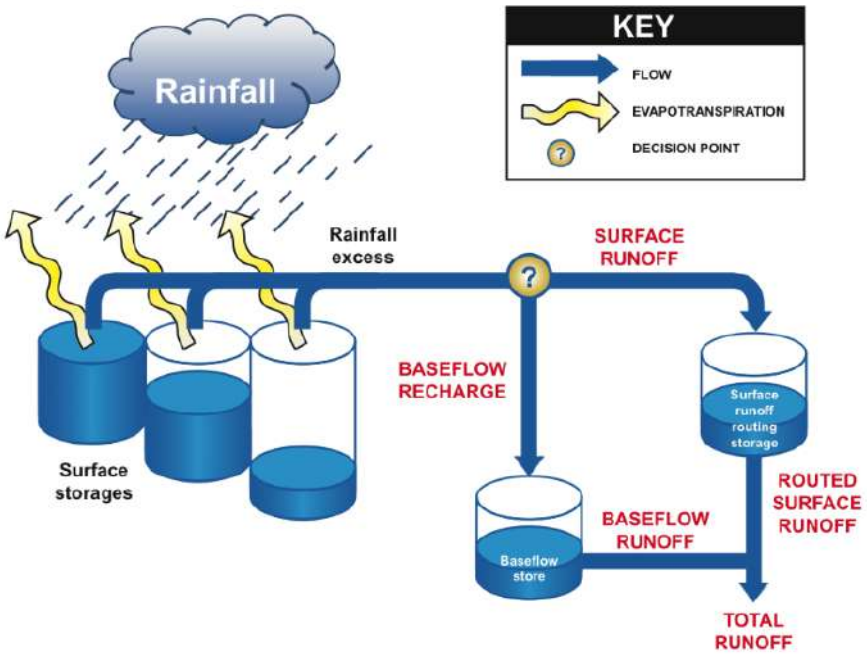

Figure 4 The Australian Water Balance Model (CRC for Catchment Hydrology, 2004)

The parameters of the AWBM and the land types used in the model are listed in Table 3. Parameters S1 to S3 and C1 to C3 together describe the three surface storages shown in Figure 4 and indicate how much storage is available in the land type to detain rainfall volume. The hardstand land type has a very low ability to detain runoff and is used to model all concrete hardstand areas. Most of the rainfall from Hardstand becomes immediate runoff. The Natural land type has medium initial ability to detain rainfall volume but relatively high capacity over time. It has been applied to the non-process, cleared pasture catchment area reporting to the stormwater dams. The Rehab Waste type has a very high retention initially and slightly lower capacity over time than the Natural type. It has been used to model the compost portion (assumed to be 25%) of the Maturation Pads area.

Table 3 The adopted AWBM model parameters

Parameters	**Description**	**Surface Type**		
		Natural	Hardstand	Rehab Waste
S1, S2, S3	The proportion of the catchment area contributing to storages 1, 2 and 3 respectively.	0.13,0.43,0.43	0.5,0.5,0	0.13, 0.43, 0.44
C1, C2, C3 (mm)	The capacity of storages 1, 2 and 3 respectively.	7.5, 76.2, 152.4	2,6,0	21, 56, 120
BFI	The proportion of excess rainfall flowing to the baseflow.	0.22	0.0	0.1
Excess	Excess from storages C1, C2 and C3.	calculated		
SS	Surface storage recharge.	(1-BFI) x Excess		
BS	Baseflow storage recharge.	BFI x Excess		
Kb (day^{-1})	The proportion of the volume of the baseflow storage remaining in the storage at the end of each day. Not applicable for this water balance model as there is no baseflow component.	0.86	0.1	0.92
Ks (day^{-1})	The proportion of the surface storage remaining in the storage at the end of each day.	0.2	0.0	0.2

4.4 Model set up

To undertake the modelling, the following arrangements have been adopted:

- Transfer and demand rates are modelled using daily time steps. In reality, transfer rates are determined during the day on an 'as needed' basis and may apply over periods smaller than a day.
- Operating rules were established in the model in accordance with advice from the design team to minimise dependency of site water supply on groundwater from bores through prioritising utilisation of recovered leachate water content and on-site stormwater water over groundwater.
- Rainfall and runoff are represented in daily time steps and therefore short duration, high intensity events are not accurately represented by the model. However, the EPA requirement to contain leachate from a 1 in 10 year, 24-hour event can be determined by considering inflows over a 24 hour (1 day) model timestep.
- The tunnel and biofilter process operates as a closed water loop from the process water tanks to the tunnels and recovered back to the process water tanks. To simplify this process, it is modelled as a net demand of 5ML per annum in the water balance model applied as a uniform daily rate. This is based on information provided by the compost technology provider.
- It is assumed that the average water demand for moistening the windrows at the Maturation Pads is 5ML per annum on days with less than 5mm of rainfall (equivalent to 13.7m^3/d). On days with 5mm or more rainfall the model sets the windrow moistening demand to zero.
- The rate of return leachate from Maturation Pads to leachate dam is assumed to be half of the moisture loss ((44%-30%)×35ML) per annum, which is equal to 2450 m^3 per year applied as a uniform daily rate in the model. This assumption is very conservative and will be reviewed as part of the refinement of the process water cycle during detailed design.
- The surface area of the Leachate Dam is assumed to vary linearly with the volume stored from 9,500m^2 up to a maximum surface area of 12,100m^2. Evaporation volume is calculated based on the stored volume and this relationship. Runoff is calculated across the maximum area of the Leachate Dam. The Stormwater Pond is treated in the same way with a surface area of up to 1,600m^2.

A screenshot of the water balance model as represented in GoldSim, is provided in Figure 5.

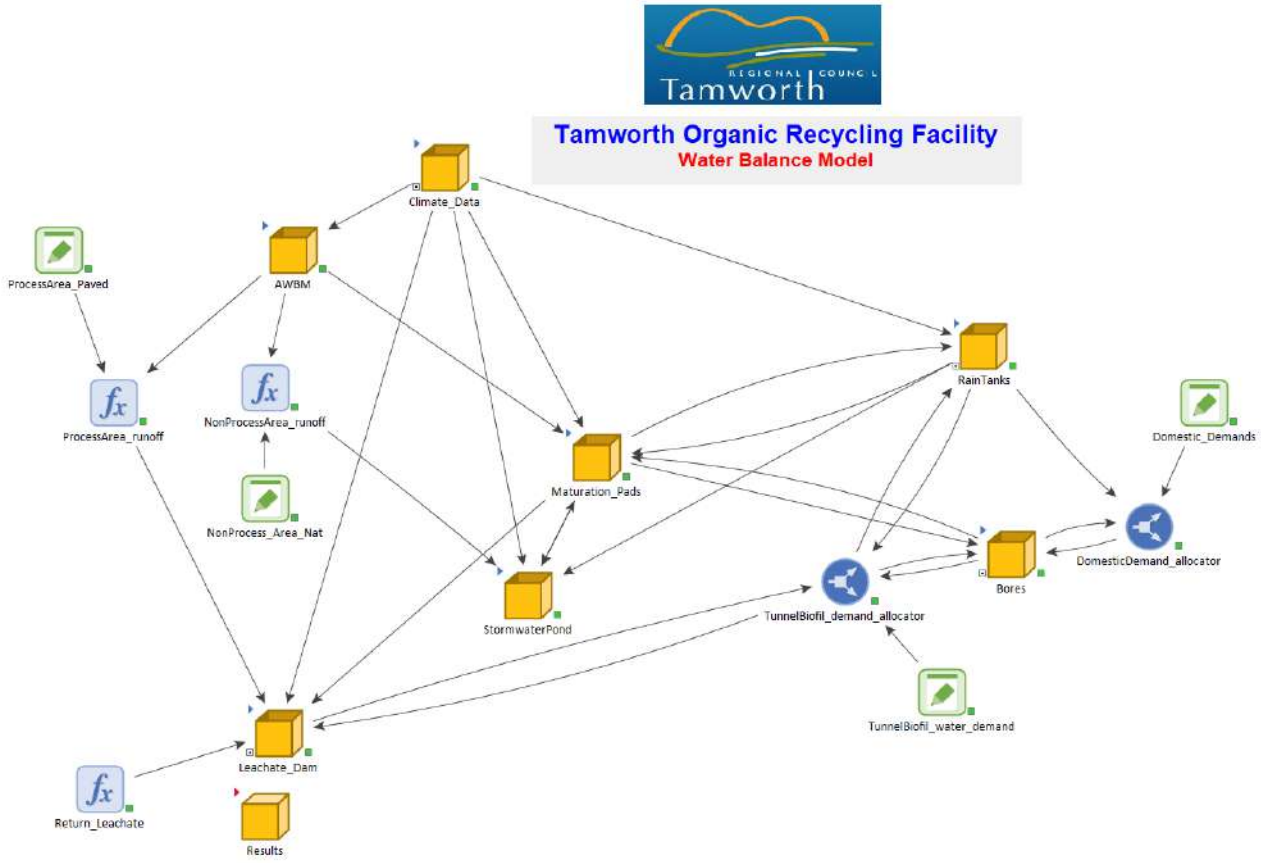

Figure 5 Screenshot of Tamworth ORF water balance model

5. Model results

5.1 Maturation Pad Moistening Demands

The Maturation Pad water demands are set at a daily rate of 13.7m^3 per day on days where rainfall is less than 5mm (equivalent to an annual rate of 5,000m^3/yr). Modelling results show that this occurs on average 329 days per year and equates to a total demand of approximately 4,500m^3 per year. Table 4 shows the average annual volume of water supplied to the Maturation Pads by the three possible sources in order of preferential use. Note that as these are average annual values based on a daily timestep over 20 years and 110 realisations, the sum is not exactly the average annual total demand of 4,500m^3.

Table 4 Average annual supply of Maturation Pad Moistening Demands

Source	Average annual supply (m^3)
Process Building and Biofilter rainwater tank	2,330
Stormwater Dams	1,820
Bores	590

5.2 Leachate Dam

The Leachate Dam capacity was set based on the results of the site water balance modelling. A capacity of 16ML was determined to allow the Leachate Dam to operate with a maximum likelihood of two overflow events per twenty years in a median 20 year period. In terms of the model realisation concepts, this equates to 50% of the 20 year realisations showing two or fewer overflow events in total. This concept of continuously modelling climate realisations is necessary for understanding an operational water balance but differs somewhat from an event-based runoff volume calculation as shown below. The use of the median climate series to establish the likelihood (i.e. 1 in 10 years) of a rainfall event is considered the most appropriate interpretation of the EPA requirement to capture the 1 in 10 year, 24 hour event.

The Leachate Dam average annual water balance is shown in Table 6. The median and 95th percentile operation of the Dam is shown in Figure 6.

The required volume of storage that is to be kept available at any time to capture a 1 in 10 year, 24 hour event is calculated to be approximately 3.1ML, determined using the Rational Method as presented in Table 5.

Table 5 Rational method calculation, 1 in 10 year, 24 hour event volume runoff

Parameter	Value	Units	Description
C	0.9	-	Runoff coefficient (for hardstand)
I	0.00412	m/hr	Rainfall Intensity (refer Table 1, 24hr 10% AEP event)
A	34,600	m^2	Catchment Area (Process area and maturation pads)
Q (Peak Flow)	128	m^3/hr	Q=CIA [Rational Method Formula]
Daily Inflow	3,079	m^3	Q x 24 hour duration

Table 6 Mean annual inflows and outflows to Leachate Dam

	Mean Annual Volume (m^3)
Inflows	
Process area runoff	3,497
Maturation pad runoff	4,238
Direct rainfall	7,581
Return leachate	2,450
Total annual average inflows	**17,767**
Outflows	
Tunnel/biofilter demands	5,000
Surface evaporation	13,937
Total annual average outflows	**18,937**

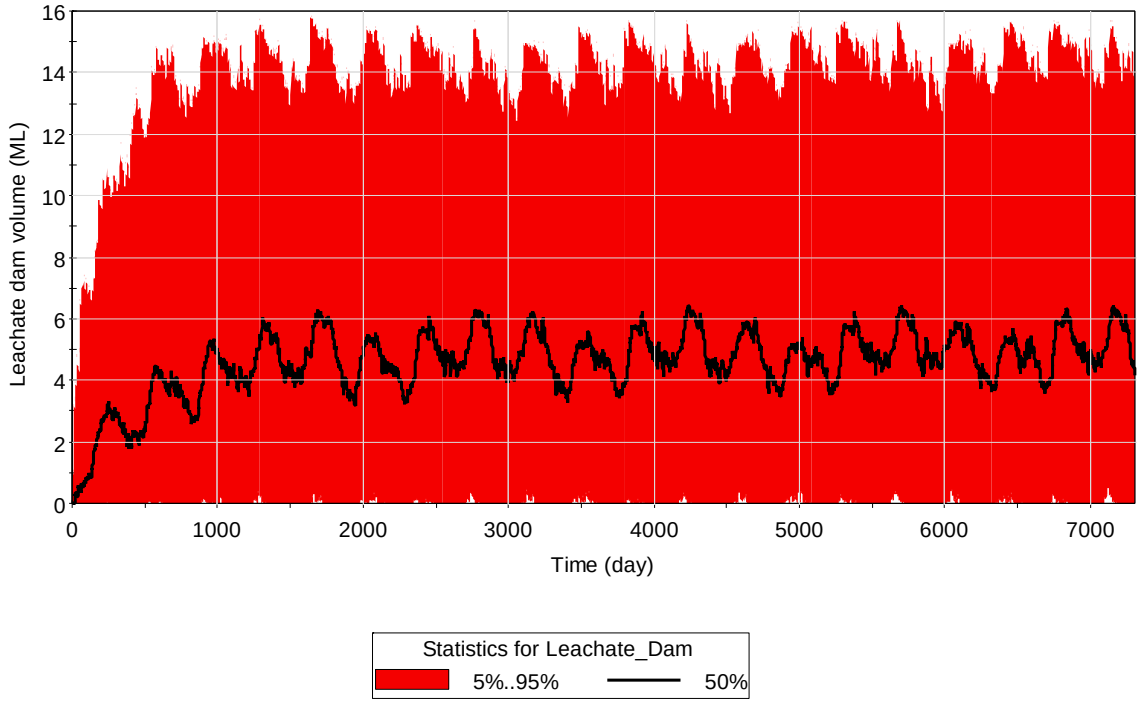

Figure 6 Daily variation in Leachate Dam volume during operations at the 5th and 95th percentiles and the median

5.3 Stormwater Dam

The Stormwater Dam was modelled as a combined storage with a capacity of 2,400m^3 and a maximum surface area of 1,600m^2. It provides make-up water to supply the demand for Maturation Pad watering and potentially other non-potable water demands. The results of the modelling show that the Stormwater Dam provides an average of 2ML per year of water to the Maturation Pads. The median and 95th percentile operation of the Dam is shown in Figure 7.

Further refinement of the Stormwater Dam water balance will be undertaken with the confirmation of contributing catchment areas during detailed design.

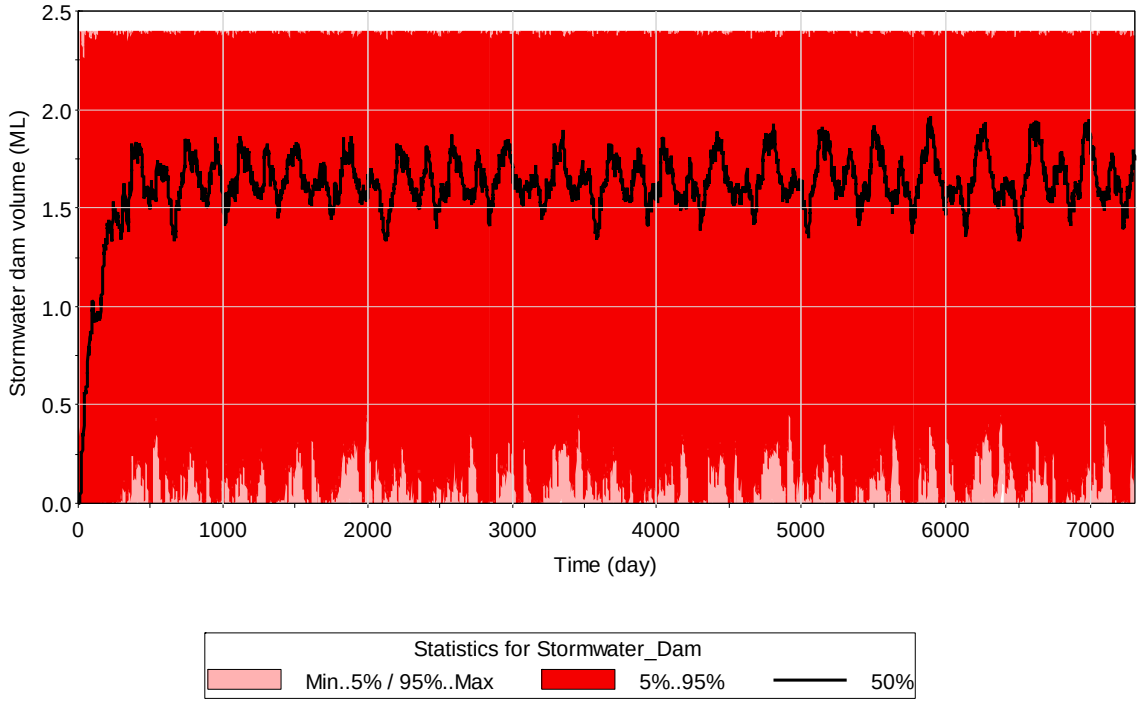

Figure 7 Daily variation in Stormwater Dam volume during operations at the 5th and 95th percentiles and the median

5.4 Process Building and Biofilter Rainwater Tank

The process building and biofilter rainwater tank is used as the first priority water for moistening the Maturation Pads. Modelling results show that the tank is able to provide on average 2.3ML of the Maturation Pad demand.

The rainwater tank is full on average 112 days of the year, but generally operates at between 0 and 100m^3 full as per Figure 8, due to the large volumes being regularly extracted for Maturation Pad moistening. The daily volume of water supplied from the rainwater tank to the Maturation Pads is shown in Figure 9.

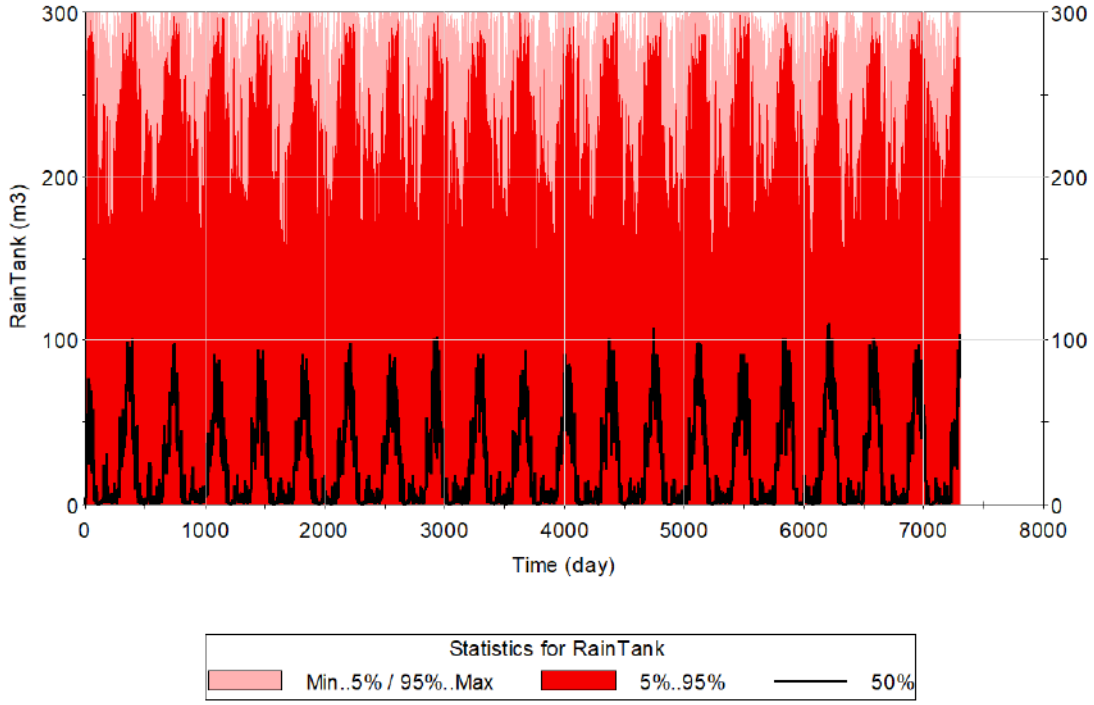

Figure 8 Daily variation in Process Building and Biofilter Rainwater Tank volume during operations at the 5th and 95th percentiles and the median

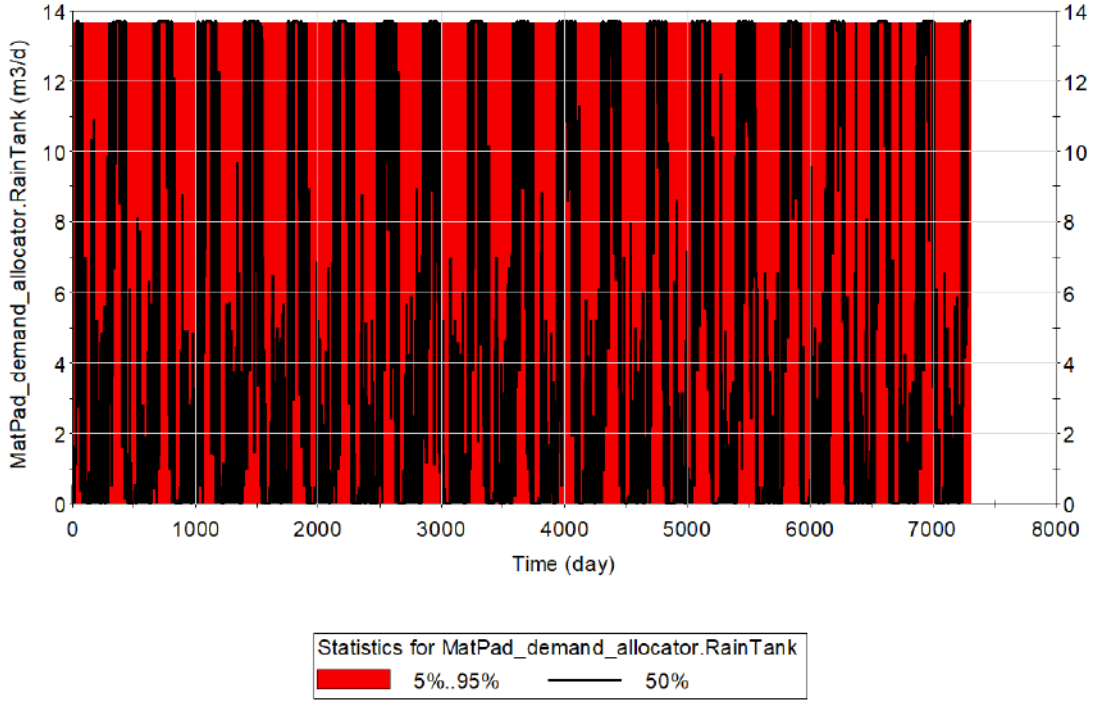

Figure 9 Daily Maturation Pad demands supplied by the Process Building and Biofilter Rainwater Tank at the 5th and 95th percentiles and the median

5.5 Bore water

A maximum allowable extraction of 6,000m^3 per year was included in the model for use as make-up water in the instance of shortfalls from what is available from the Rainwater Tank and the Stormwater Dam. Modelling showed an average use of only 425m^3 per year, although more than 5,000m^3 is required in a small number of modelled years as shown in Figure 10. The existing extraction limit of 6,000m^3 will suffice in topping up watering requirements in dry periods. No extraction will be necessary for process water demands in wet periods.

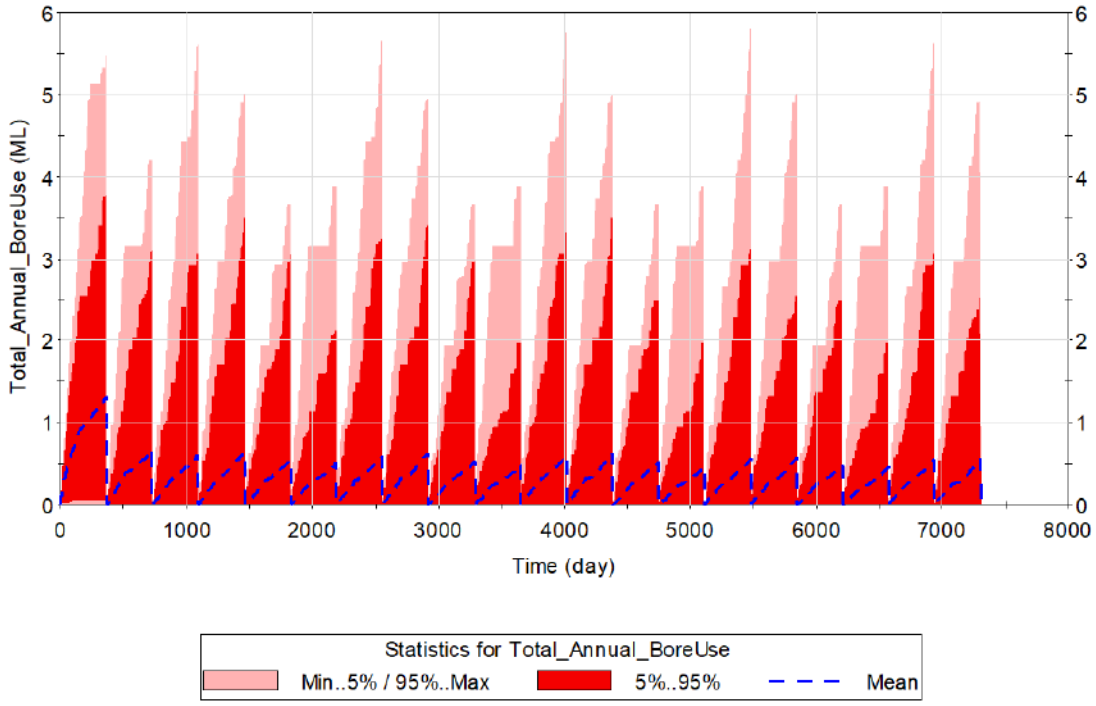

Figure 10 Annual bore water use for operations at the mean, 95% percentile and maximum use values

6. Conclusions

This Site Water Balance model has been prepared for the proposed Tamworth ORF to support an EIS and development application. All water inputs and outputs were identified, and the operational requirements calculated based on information supplied by potential composting technology providers, climatic factors and preliminary engineering design details.

The water balance results were used to inform aspects of the preliminary engineering design including leachate dam size. Due to site considerations and constructability aspects the exact sizes as defined in this report may vary with detailed design. The water balance would be reviewed at detailed design stage.

A summary of the main sources of water generation and water storage sizes are provided in Table 7.

Table 7 Summary of water balance model outcomes

Area	Area m^2	Water Type	Mean Annual Runoff Volume **(m^3 per annum)**	Storage Type	Designed Storage Volume
Office/Amenities Building roof	158	Rainwater	Not modelled	Tank	20kL
Equipment Shed roof	840	Rainwater	Not modelled	Tank	300kL
Process building and biofilter	4,715	Rainwater	2,980	Tank	300kL
Non-Process Area runoff	153,400	Stormwater	6,530	Stormwater dam	2.4ML
Process Area runoff	13,600	Leachate	3,500	Leachate dam	16ML
Maturation Pad	21,000		4,240		
Imported – Process Water (UV treated on site)	N/A	Underground Bore	N/A	Underground	N/A
Imported – Firefighting (trucked to site in tankers)	N/A	Potable Water	N/A	Tanks	590KL (effective)

The water balance modelling determined that:

- site water demands can be sufficiently supplied by the water sources available at the site, based on weather variability and operating arrangements. Bore water would be required as a back-up water supply at times.
- a 16ML leachate dam is adequate to fulfil operational needs and exceeds to minimum requirements to capture and contain leachate generated by a 1 in 10 year, 24 hour event.

pitt&sherry

Tamworth Organic Recycling Facility Water Balance Model

Site Water Balance

Contact

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Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport
Wagga Wagga

Report of Biosecurity Expert

For: Adam Bishop
Principal Environmental Consultant
pitt&sherry

Biosecurity Risk Assessment
Proposed Organic Recycling Facility
Gidley Appleby Road Gidley NSW
DA2020-0138-284
Tamworth Shire

Biosecurity Expert
Dr. Peter C. Scott
Scolexia Pty Ltd
Animal and Avian Health Consultancy
16 Learmonth Street
MOONEE PONDS Vic. 3039

January 2020




CONTENTS

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1.0 Name And Address of Expert

Dr. Peter C. Scott BSc, BVSc, PhD
Scolexia Pty Ltd
16 Learmonth Street
Moonee Ponds
Vic 3039

2.0 Experts Area of Expertise and Experience to Undertake This Report

Dr. Scott has had over 30 years of experience in intensive animal disease investigations and part of those responsibilities included investigations into production problems that may be related to husbandry, nutrition or disease. Peter holds several industry, academic and government positions that are directly related to providing technical information regarding intensive animal production, planning and environment, waste remediation, biosecurity risk assessment, project management. Some of these positions are or have included:

1. **Member of the Consultative Committee on Emergency Animal Disease (CCEAD)** which is the technical group responsible for decision making in the event of an Emergency Animal disease (EAD).
2. **Technical Advisor** to the Australian Eggs Ltd (AE).
3. **R & D committee (ICC) of the AE**. This role is involved with reviewing research related to emissions from poultry sheds and their impacts on the environment.
4. **Avian and mammalian pathologist** with the Department of Primary Industries of Victoria from 1979 to 1989.
5. **Committee member of Australian Food Standards** in the review of food safety for eggs and egg products.
6. **Committee member and technical advisor** to the AECL Egg Nutrition Advisory Group (ENAG) regarding food safety and AI.
7. **Associate Professor at the University of Melbourne** holding the position of Coordinator of Applied Research for the Asian Pacific Centre of Animal Health.
8. **Field veterinarian** for Australian and International companies.
9. **Consultant to State Food Authorities and Health Departments.**
10. **Biosecurity Consultant Insurance Underwriters.**
11. **Environmental Management Plans (EMP)** for various development applications.
12. **Author of National Water Biosecurity Poultry Production**, Department of Agriculture, Fisheries and Forestry, 2009.
13. **Author of National Farm Biosecurity Technical Manual for Egg Production**, Animal Health Australia, 2015
14. **Author of the Salmonella Enteritidis Response Plan,** Australian Eggs 2018

3.0 Directions to Form Basis of a Report

1. Adam Bishop of pitt&sherry identified the scope of work is to address the RFI (request for information) by the DPI (agriculture) in an email by Byron Stein dated 5 November 2019. "*It is recommended that a suitably qualified expert with expertise in poultry biosecurity undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks*. Copies of my email correspondence of instruction are in **Appendix 1.**
2. A copy of my curriculum vitae is attached at **Annexure 2,** which contains further description of my background and experience.

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4.0 Materials Provided for this Report

1. ABPTC - Draft Tunnel Conceptual Process
2. Aerial - Forest Road Landfill complete 19-10-23
3. Appendix E Air Quality Impact Assessment
4. Appendix L Hazard and Risk Report
5. FAQ Organic Recycling Facility Jul 2019
6. ORF - Site Layout
7. Organic Recycling Facility Community Information Session Report 8 July 2019
8. Process Building Drawings
9. SEARs 1340 Planning Secretary's Environmental Assessment Requirements, Tamworth regional Council
10. Site Locality Forest Rd Landfill
11. Site Overview Concept Drawings
12. SY19089S001 ppt Tamworth ORF Consultation Meeting RevB2
13. Publications
    a. 1999 Fisher et al.: Mycotoxins of Aspergillus fumigatus in pure culture and in native bioaerosols from compost facilities, Chemosphere: Vol. 8 No. 8 p.174
    b. 2001 Recer et al: Ambient air levels of Aspergillus fumigatus and thermophilic actinomycetes in a residential neighbourhood near a yard-waste composting facility, Aerobiologia: Vol 17 p. 99
    c. 2002 Kampfer et al: Imission of microorganisms from composting facilities, Microbiology of Composting Ed. SD, Klammer (Berlin: Springer), 571.
    d. 2016 Van Leuken: Atmospheric dispersion modelling of bioaerosols that are pathogenic to humans and livestock - A review to inform risk assessment studies
    e. 150107-order-exemptions-factsheet
    f. DR AS 4454: Composts, soil conditioners and mulches (Revision of AS 4454-2003)
    g. 2008 Chinivasagam; Food-borne pathogens and animal botulism issues surrounding the on-farm composting of layer chicken waste and mortalities a review. Queensland Government DPI and Fisheries
14. Email Correspondence: Consolidated in **Appendix 3**.
    a. Megan Mather; Tamworth Regional Council; 05/11/19: Tamworth Organic Recycling Facility - Seeking Independent Advice – Biosecurity Risks.
    b. Megan Mather; Tamworth Regional Council; 06/11/19: Tamworth Organic Recycling Facility – Additional Information - Biosecurity Risks.
        i. Objections
        ii. Comments and Summary of Planning issues.
        iii. Tabulated Input Organic Materials and Quantities as estimated 2017/2018 data
        iv. Vehicle type assessing the proposed facility
        v. DPI – Agriculture's request and rational
    c. Megan Mather; Tamworth Regional Council: Tamworth Proposal; 22 /11/19.
        i. Table 1: Received input of Paunch Organics at Forest Road Landfill for last 6 months.
        ii. Table 2: Received input of Offal Organics at Forest Road Landfill for last 6 months
        iii. Acceptance of poultry litter as General Solid Waste
    d. Kate Wingett; Senior Veterinary Policy & Project Officer, NSW Department of Primary Production: Biosecurity & Food Safety: 03/12/19
        i. Information on NSW EPA public orders and exemptions for resource recovery
        ii. Clarification of 'generators" and "consumers" in regard to waste composting orders and exemptions.
        iii. Further advice on Composting Orders and Exemptions.
    e. Kate Wingett; Senior Veterinary Policy & Project Officer, NSW Department of Primary Production: Biosecurity & Food Safety: 03/12/19: Detail on Specific Composting Orders
    f. Byron Stein, Development Officer, Poultry Meat Intensive Livestock. NSW Department of Primary Industries, Agriculture: 04/12/19
        i. Clarification that compost subject to a resource recovery order (RRO) does not apply animal material / carcasses.
        ii. Compost containing animal material requires a specific or individual RRO.

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iii. EPAS requirements of 55°C for 3 days and repeated 5 times for a total 5 days for windrows and 55°C for 3 days in static aerated piles based on US EPA protocols. Attached documents.

g. Megan Mather; Tamworth Regional Council: TRG – ORF Project – Additional Information – Biosecurity, 06/12/19
   i. Site Locaitry.pdf: Aerial -Forest Road Landfill complete 19-10-23 pdf
   ii. Forest Road Landfill Composting Facility and daily operations.
   iii. DAF / Grease Trap
   iv. ABPTC – Draft Tunnel Conceptual Process.
   v. Operational handling of raw materials and out-going materials.

h. Megan Mather, Response to questions, 17/12/19.

5.0 Expert's Approach to Completing this Report

Biosecurity is defined in a variety of ways by responsible organisations:

For the **OIE** it means a set of management and physical measures designed to reduce the risk of introduction, establishment and spread of animal diseases, infections or infestations to, from and within an animal population.
FAO: A strategic and integrated approach that encompasses the policy and regulatory frameworks for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment.
Biosecurity Australia describes itself as providing science-based quarantine assessments and policy advice to protect Australian agricultural industry, and to enhance Australia's access to international animal and plant related markets.

Thus, it can be seen that there are considerations of the species that may be potentially affected, the microbiological nature of that threat, the physical activity involved in mitigating that biosecurity risk and finally the procedural and operational protocols required.

Importantly, as recognised by Biosecurity Australia, a nil risk policy though is not the aim as under this restriction it would not be feasible to operate activities (such as imports, vehicular movements, necessary horizontal contacts) that allow for social and community interactive benefits. Biosecurity is thus about risk minimisation / mitigation.

An overview from information provided of the proposed Organic Recycling Facility will be undertaken looking at location, design, operational aspects, input materials and finished product.

To objectively undertake a Biosecurity Risk Assessment there is a need to look at all the components that contribute to the biosecurity risk of the specific activity being reviewed: in this case being the Organic Recycling Facility (ORF) proposed by Tamworth Regional Council.

<u>Components to be considered include</u>:

1. Source material that may or does contain the infective agent.
2. Organisms or pathogens involved.
3. The endemic status of the infective agent in regard to a pragmatic approach to biosecurity.
4. Potential species that may be affected which includes animals, plants and humans.
5. Physical and chemical properties of those infective or environmental contaminating agents
   a. Ability to inactivate the agent.
6. Epidemiology of disease spread:
   a. Nature of the spread being aerosol, horizontal contacts, etc.
   b. Persistence in the environment or infected host.
   c. Vectors of spread which may be animate or inanimate.
   d. Cross contamination.

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7. Ability to monitor, detect and trace the biosecurity risk.
8. Spatial separations from sources of infective material to susceptible sites and populations.
9. Protective procedures or mechanisms to reduce the likelihood of infection. Vaccination is an example.
10. Ability to contain a source of infection and the risk of spread.
11. Establish protocols in a biosecurity program that are workable and auditable

Finally, specific consideration will be given to respond to the Request for Information (RFI) by the NSW DPI (Agriculture) on eight (8) points; with a particular emphasis on biosecurity (**Section 11**).

Concluding remarks will identify the critical points around biosecurity in the operation of the proposed ORF and based on a risk assessment the way these can be mitigated.

6.0 Factual Matters and Assumptions Used Within The Report

While aware of the legislation and control orders associated with composting activity and the obligations of generators and consumers, the author of this report will not cover these aspects in the expert report other than the understanding that compost produced containing materials of animal origin requires a specific or individual resource recovery order and exemption from NSW EPA if the material will be removed from the site. This subsequently mandates requirements as to the temperature and time parameters around the compositing process.

6.1 Proposed Organic Recycling Facility (ORF)

Preliminary concept design is a Tunnel Composting System (TCS) which involves the independent treatment of batched organic products in fully enclosed long ventilated composting tunnels for up to 4 weeks. The operation involves mechanical fan ventilation and controlled water addition to optimise aeration, temperature and moisture. Advantages of the process are claimed to include faster composting under improved monitoring and control, reduced need for turning and the associated costs and reduced energy and water requirements. Extensive literature is available through internet searches and articles (Griinklee,1998;Lindberg,1996: http://www.environment.gov.au/protection/waste-resource-recovery/publications/food-and-garden-organics-best-practice-collection-manual) as to the acceptability of the technology in achieving effective composting over shorter time periods than windrow composting, with the necessary pathogen reduction, improved energy efficacy and leachate control. A schematic outline of typical TCS is provided in Fig.1. A YouTube presentation at https://www.youtube.com/watch?v=mBQ8n-sbGok will also provide the reader of this report with a perspective of the operational aspects of a TCS.
It is noted that the final detailed design of the proposed Tamworth Regional Council has not been completed pending the final DA approval. The preliminary Process Building Drawings show a large enclosed reception area for all the various solid, sludge and liquid waste materials, seven (7) Tunnel Compositing units configured with a layout of 4 and 3 on each side and a central corridor and exit, covered biofilter and leachate storage tank. Pasteurised material is then removed from the tunnel composter and placed outside on large padded area for further "maturation" and storage prior to being taken off site as finished material.

The document titled; ABPTC – Draft Tunnel Conceptual Process, provides detail regarding the fundamental design and operational aspects of the TCS. This includes:
The tunnel processes comprises two stages for pasteurisation (14 days) and composting (14 days). After the first stage, the tunnel batch would be loaded into another tunnel for the second stage of processing; and material will be pasteurised (55-65°C) to destroy pathogens and denature weed seeds.
ABPTC advised the Tamworth Reginal Council:
"*Given that the tunnel process is a static process, it is necessary to move, mix and break up the material after the first cycle in the tunnel. The material settles and compacts over time. So, this is not about any remaining unpasteurised 'pockets' or aeration. We always observe increased activity after a mixing step which fosters further break down, similar to what you can watch in windrows after turning. The bacterial can access fresh food sources.*

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The material will be/shall be pasteurised after the first cycle and the second cycle would only compost the material in order to increase the level of maturity, typically at lower temperature in order to stimulate the diversification and growth of the type of bacteria (such as fungi which can 'crack' the woody parts containing celluloses and lignin). Without mixing after the first cycle, the material would not achieve the desired degree of maturity."

The facility aims to divert existing organic materials from landfill to the proposed ORF and produce a high quality product for reuse. Such technology is well established and utilised currently by other councils such as that at Lake Macquarie City Council commissioned in 2018.

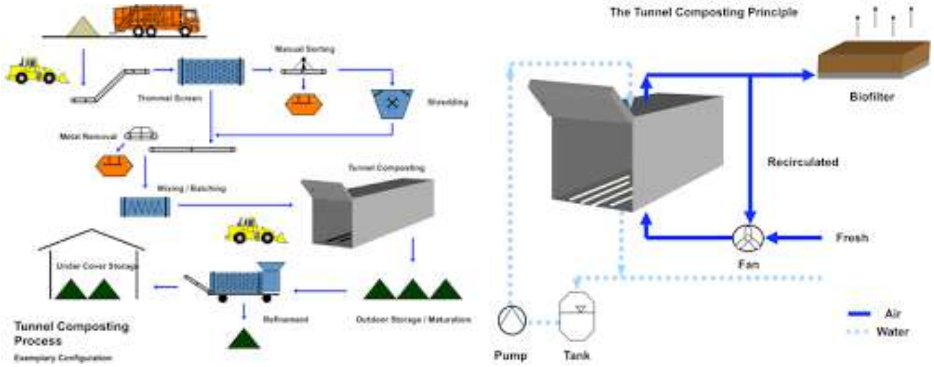

Figure 1: Schematic Outline of a Typical Tunnel Composting

The proposed facility to be located at 284 Gidley Appleby Road, Gidley NSW.
At this location it is adjoining a large broiler growing complex, a cluster of 4 by 6 shed units, operated by ProTen which is contracted to Baiada Poultry, at 500 metres from the proposed ORF. There are other broiler farms located 1 and 3 kilometres away.
The facility aims to divert existing organic materials from landfill to the proposed ORF and produce a higher quality product for reuse.

6.2 Current and Existing Waste Disposal Activity in the Tamworth Region

It is proposed that much of the waste material (plus additional material) for bioremediation that is currently going to the Forest Road landfill (**Appendix 4**) will be diverted to the proposed ORF.
Other existing material such as DAF / Grease Trap sludge is obtained from chicken, beef and lamb protein recovery (rendering) operations and from other commercial operations such as fast food outlets, restaurants and hotels. The DAF after drying is currently disposed through land application when approved or by landfill and Grease Trap waste taken to a WWTP where the settled water is treated and the consolidated fats and solids removed to an offsite licenced facility operated by Cleanaway in Newcastle.

6.3 Types of Waste Material Inputs for the proposed ORF

The type of waste materials to be received was detailed in email correspondence (**Appendix 3**) from Megan Mather, Tamworth Regional Council on the 6th and 22nd November 2019.
The type of waste materials include:

- Kerbside waste (Food Organics and Garden Organics {FOGO})
- Green waste
- Timber
- Paunch[1] (beef and lamb)
- Offals[2] (poultry, beef and lamb) and Poultry Carcasses / Mortalities
- Liquid Waste

[1] **Paunch**: The first stomach of ruminant (cattle and sheep)
[2] **Offals**: Entrails, internal organs and animal other animal parts.

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- DAF[3] Sludge / Grease Trap
- Poultry litter, accepted a General Solid Waste

Information regarding the vehicle types assessing the ORF were also provided (**Appendix 3**).This did not mention liquid transport vehicles.

7.0 Biosecurity Risk Assessment of Input Materials

Emergency Animal Diseases (EAD) requires some objective discussion in regard to the real or perceived biosecurity risk of the proposed ORF in the event of an EAD associated with livestock, other animals, insects and plants. The ORF would be a potential horizontal contact through vehicular movements bringing in potentially contaminated materials from a positive EAD site prior to its recognition (incubation and prior to confirmatory diagnosis). The increased mix of materials from processing plants (abattoirs), intensive animal facilities and DAF could though increase the risk of cross contamination between input vehicular movements. The risk mitigation here will be the same as for the ongoing endemic disease consideration and will be considered below in the relevant Sub Sections in **Section 7**.
In regard to the post arrival treatment (pasteurisation) of potentially contaminated materials at the ORF, this is a preferred outcome to existing practices of land fill, open air composting, use of raw material in horticultural activities or spreading on pasture.

The Tamworth Regional Council does though need to consider contingencies and policies in the event of an EAD in the region and the handling of contaminated material. While this now would apply to existing horizontal contacts and waste disposal sites for contaminated material it would also apply to the proposed ORF with expected added complexities in regard to multiple inputs and outputs.
Under the EAD Response Plan (EADRP) any contaminated or suspect contaminated material received would mandate that the ORF be considered a suspect In Contact Premise (ICP) and including the transport vehicles. Until proof of freedom the site would be quarantined with no movements in and out and this would apply to the adjoining poultry farms and particularly the one at 500 metres. Under normal monitoring procedures proof of freedom would take around 10 days during which time all movements would be prohibited. In the event of contaminated material being detected on site the ORF would be categorised as an Infected Premise (IP) and be subject to the quarantining of all movements until proof of freedom was established after cleaning, disinfection and monitoring. A one (1) kilometre Restriction Area (RA) would be placed around the facility of which there is the normal requirement that anything within the RA involving the host species (e.g. poultry) would be subject to slaughter out and eradication. Farms between 1 and 10 kilometres would need to be monitored for proof of freedom and then subsequent movements would be under permit.
The nearest shed boundary of the Proten broiler complex is approximately 500 metres from the proposed position of the maturation compost storage and the furthest shed border over 1 kilometre away. In the case of the ORF becoming an IP the entire ProTen complex would be considered to be in the RA.

Note also in the event of an EAD for example in poultry there is the dilemma of where to dispose securely of the slaughtered birds, product such as eggs and also contaminated litter and detritus. In the past these have been undertaken by approved site burial, composting and rendering plants. These alternative are all becoming more restrictive with often "unhelpful" assistance from the various responsible bodies and industries. Though unlikely the proposed ORF could be seen by EAD response team as a secure disposal site because of its pasteurisation process. This if it were to happen would invariably significantly reduce the operations activity at significant cost and loss of waste contingencies. This is a real scenario with such activity occurring at a NSW rendering plant at the last Avian Influenza outbreak in NSW.
In a reverse buffer consideration, if the ProTen site became an IP then the ORF would have its operational activity affected. The time period for this would be approximately 10 days while proof of freedom is established.
All the above considerations are applicable to the current ongoing activities of the movement, composting and landfill of animal material and waste.
The Tamworth Regional Council needs to have a proactive formal policy in place regarding EAD in their region.

[3] **DAF**: Dissolved air flotation (DAF) is a water treatment process that clarifies wastewater by removing suspended solids.

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For each of the considered inputs in **Section 7** no further comments will be addressed in regard to an EAD.

7.1 Kerbside waste (Food Organics and Garden Organics {FOGO})

FOGO would be generally considered a low biosecurity risk in regard to animal and plant disease. The reason why it is low and not very low (Refer Figure 1) is because of the recognition that household waste may contain non-compliant material such as imported foods and plant material that has breached Australian quarantine laws. This has been validated recently by the significant number of seizures of pig products at border control points that have tested positive for African Swine Fever (ASF) and even Foot and Mouth Disease. Similarly, it is recognised that a large amount of plant and particular seed also enter Australia via international travellers and cargo and a significant proportion is not detected.

Biosecurity Risk Assessment: Tamworth is in a recognised area of wild pigs and thus the placement of FOGO in open landfills and even with partial burial is a biosecurity risk for the potential incursion of an Emergency Animal Disease (EAD) such as ASF. Noting the current international situation there is a heightened awareness of the threat of an incursion of ASF into Australia and the recognition of Australia's susceptibility because of its significant feral pig population.

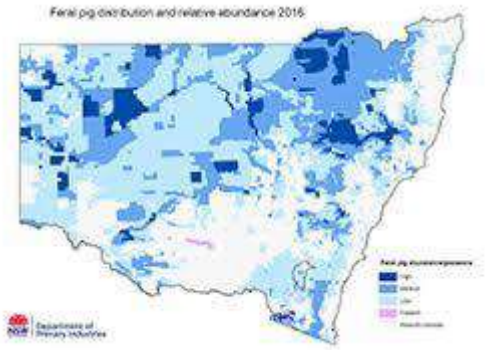

Image 1; Distribution Map of Feral Pigs in NSW

The diversion of FOGO to the proposed ORF is seen as a much preferred option than the current landfill practice.
The same consideration and preferred outcome is for plant and seed material also provided that the compliance composting temperatures are met and achieved as detailed in AS: 4454 2013 and the US EPA Part 5 Biosolids Rule 1994. This is with the understanding that the final composted and pasteurised product will be used eventually in horticultural activities. This applies to both exotic seeds and endemic pest seeds (e.g. Patterson's Curse). There are legislated guidelines (Rendered Animal Material ACT)[4] as to the appropriate use of waste material from animals fed meat meal.

7.2 Green Waste and Timber

Green waste and Timber is seen as a very low biosecurity risk in regard to animals and low risk for plants, seeds and plant pests as for FOGO. Refer **Section 7.1**.

[4] https://www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/tse-freedom-assurance-program/australian-ruminant-feed-ban

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7.3 Paunch (beef and Lamb)

Paunch material can contain a number of endemic infectious agents that could pose a biosecurity risk to the host species and in the case of salmonella and toxigenic *E. coli,* a zoonotic risk. Plant seeds from noxious weeds could also be contained in paunch material. The risk assessment for the latter is as in **Sections 7.1**

Biosecurity Risk Assessment: In regard to vehicle movements this applies to existing waste movement activities. This will be considered separately below in **Section 8** as a standalone topic.
In regard to endemic infectious agents the operation of the ORF are required to meet the conditions as directed by the NSW EPA and detailed in AS: 4454 2013 and the US EPA Part 5 Biosolids Rule 1994.
There is need for designers of the proposed ORF to have incorporated in the control system, based on their experience, adequate probes measuring temperature and moisture in real time to provide a high confidence that after the two stage process that the entire biomass has been subjected to temperatures above 55°C but not exceeding 65° for the required minimum duration as detailed in AS: 4454 2013 and the US EPA Part 5 Biosolids Rule 1994[5].
For the zoonotic aspects this additionally involves the handling of the raw input material by workers who need to ensure that phytosanitary and personnel hygiene procedures are optimal and are consistent with those recommended and guided by the NSW Food Authority and those that are applicable to abattoirs and rendering plants.
Cross contamination of raw input materials with pasteurised product prior to storage for maturing is a biosecurity risk assessment for the outward movement of compost. This will also be covered in **Section 9**

7.4 Offals (poultry, beef and lamb) and Poultry Carcasses / Mortalities

For ruminant offals **Section 7.3** applies. As Australia is negative for Bovine Spongiform Encephalopathy (BSE) the zoonotic risks of handling ruminant offal material including nervous tissue is not applicable.
It is still legislation though in Australia that all materials containing rendered animal protein is subject to restrictions and withholding periods (RAM ACT).

In addition to the broiler material in recent times the low capital value of spent layer hens (egg layers past their economic value) has meant that the mass destruction of these is becoming more common and carried out under approved methods such as gassing with carbon dioxide. The carcasses are subsequently sent for the production of a low quality rendered material, composted with a carbon source or disposed of in new technology bioremediation plants where they are recovered as a high quality fertiliser. Incineration is a less common form of disposal.
The poultry material in the Section (including poultry litter **Section 7.6**) is considered the highest biosecurity risk for this proposed ORF facility noting the intensity of poultry, broiler chickens, in the Tamworth Region and its economic importance to the district. In particular the close proximity of the ProTen broiler complex at 500 metres intensifies the biosecurity risk of transmission of infectious agents by aerosols, paratenic hosts and passive carriers like vermin and flies.

Biosecurity Risk Assessment: The endemic infectious agents of most significance include the avian viruses Infectious Laryngotracheitis (ILT), Infectious Bronchitis (IBV), Fowl Adenovirus (FAV), Chicken Anaemia Virus (CAV), Fowl Pox (FP), Marek's Disease (MD) and Infectious Bursal Disease (IBD). Bacterial diseases include mycoplasma (M*. gallisepticum* and *M. synoviae*), *E. coli*, salmonella and campylobacter. Insects such as Red and Northern Fowl mites and lice are also significant avian pathogens. Finally, litter beetles while not pathogens of chickens can be vectors of avian disease agents and also cause significant damage to facilities.

Poultry Viral Diseases: of those mentioned above in short lived birds like broilers they are all endemic in the broiler grow outs in the Tamworth region and most are effectively controlled by vaccination or maternal antibodies derived from the parents of the hatching eggs. ILT is the disease that requires more discussion because its control by vaccination alone is limited (but achievable) and biosecurity is an important aspect of

[5] The ABPTC - Draft Tunnel Conceptual Process indicates that the material is pasteurised in 14 days. This is thus dependent on AS: 4454 2013 condition being met as detailed Appendix O; Section O5: In-Vessel (Bioreactor) Horizontal Configuration.

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its control. The disease is currently existing and endemic in the Tamworth region and thus spread has been ongoing implying that currently applied mitigation procedures including horizontal contacts and vaccination are not proving effective. The prosed ORF is thus not expected to contribute to any increase or enhancement of ILT but in fact may improve the situation through better containment and control of secure vehicular movements and the pasteurisation on input material including poultry litter compared to existing practices of disposal.
Australian epidemiological observations indicate that ILT can spread by aerosol for up to 2 kilometres under favourable conditions, this being in the drier ambient conditions. This thus puts the ProTen broiler complex as a potential risk site for the aerosol spread of ILT from the ORF and then the subsequent on spread to the other more distant two adjoining broiler farms. The incremental increase in risk of ILT at the ProTen site is unknown as the author does not have any information on ProTen's current or historical status in regard to ILT incidences. The potential ILT outbreaks to occur because of existing horizontal contacts including catching crews, vehicular movements, adjoining farms, personnel movements, etc.

The ORF biosecurity risk mitigation steps for ILT and aerosol spread to the ProTen broiler complex include:

- Knowledge and traceability of the type of material being brought into the ORF.
- Poultry offal and poultry litter transported in sealed / covered vehicles until entered into the receival enclosed area. Refer **Section 8**
- Poultry material remains in enclosed receival area with aerosol emissions directed through the biofilter.
- Poultry material pasteurised in the CTS meeting prescribed temperature and moisture conditions.
    - ILT infectivity has been rapidly inactivated by heat when exposed to 55º C for 15 minutes or 38º C for 48 hrs (Hidalgo, 2003).
- CTS emissions diverted through biofilter which with the right type of material, proportions, moisture content and maintenance will remove up to and in excess of 90% of bacteria and endotoxins. The nature of the material in the biofilter and the bacteria present is expected to substantial reduce viruses in the bioaerosol, these being reduced by mechanical shear forces and chemical / bacterial interaction. (Frederickson, J., 2013, Janni, et. al., 2001, Tymczyna, L., 2007).
    - It is expected that the risk of ILT containing emissions entering the biofilter is only for the first days prior to the TCS achieving adequate time and temperature to inactivate the ILT virus. Noting inactivation is expected to have occurred well before the CTS reaches 55°C (Hidalgo, 2003).
- Mechanical cleaning and pathogen control (e.g. disinfection) of corridor floors to ensure cross contaminating of input material with outgoing pasteurised material is limited and inconsequential. Refer **Section 9**
- Vaccination program for ILT at the ProTen site
    - It is to be noted that there is also the possibility for reverse contamination of the maturing composted material placed externally at the ORF from aerosoling of ILT infected birds at the ProTen site. The significance of this is considered to be very low (Figure 1.).

Overall the proposed ORF is considered a better option to aid the control of ILT in the Tamworth region compared to existing practices (many of which are expected to continue). And include:

1. The vehicular movement of used litter.
2. The vehicular movement of mortalities.
3. Open sided live bird transports.
4. The storing or spreading of un treated litter material for horticultural use.
5. The "temporary" storage of litter and manure in open piles.
6. The Windrow composting pf poultry litter / manure.

The presence of the ProTen broiler complex when assessed as a biosecurity risk can be adequately mitigated noting the dot points above.

It is to be noted also that the broiler farms at a further distance to the ORF are a moderate to high (Figure 1.) risk of spreading ILT by natural aerosol transmission to the ProTen broiler complex if their sites become infected with clinical ILT.

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Poultry Bacterial Diseases; of those mentioned salmonella is the one of the most significance.

E. coli in poultry and not are readily recognised as being zoonotic unlike the enterotoxigenic strains in cattle. The endotoxins of all *E. coli* can cause symptomatic signs in animals and humans. *Campylobacter coli* and *Campylobacter jejuni* are endemic in broiler chickens and are recognised as the most significant and prevalent food safety pathogen. The organism is very labile and its survival in the environment is limited. While despite extensive studies the epidemiology of Campylobacter is still not well understood its transmission between and within broilers farms is recognised to be strongly associated with catching crew activities and live bird haulage vehicles. The biosecurity risk assessment of the proposed ORF and campylobacter is considered to be insignificant with the endemic nature of the organism.
Mycoplasma Spp. are very labile and their environmental survival limited and this not considered of any biosecurity risk with the proposal.
Salmonella spp. of the paratyphoid type of *S. Enterica* there is around 2,500 different strains which are endemic in cold and warm blooded animals / birds. In chickens they are normally asymptomatic but many strains particularly S. typhimurium are very significant food safety pathogens. The poultry industry aims to keep its breeding stock and progeny and hence poultry products free of salmonella with the potential to cause food poisoning. Thus, all horizontal contacts including people, rodents, wild birds, vehicles, contaminated feed materials and all components of biosecurity programs aiding in the control of salmonella. These are then augmented by vaccination and in feed additives and processing plant technologies.
In regard to the proposed ORF the key biosecurity risk again is the input transport vehicles and cross contamination and this will be covered in **Section 8** .
Salmonella can be very resilient in it environmental survivability either directly or through the use of carrier hosts of vectors like flies and rodents (vermin). The environmental survivability can mean eradicating salmonella can be very difficult with normal detergent wash down and disinfection programs. Its environmental "stickiness" can cause ongoing cross contamination with many physical horizontal contacts. There is the need for specific approaches to combat environmental salmonella and these are covered in **Section 9**
Salmonella vectors are mobile and thus can spread the organism over wide distances. The biosecurity risk assessment involves fly and rodent control. There is a requirement to have Standard Operating Procedures (SOP's) and Work Instructions (WI) in place that are adequate and first principle based in the control of these vectors. Historically the implementation of such programs within industries is not optimal and there is a need for a third party audit by a party that has both technical and applied knowledge in the areas. More specifically there is a need for a rodent and pest control plan developed for the site by a person(s) who is qualified and experienced in rodent and pest control and record keeping that shows active and ongoing monitoring of rodents, bait stations and other nominated control strategies.
The operational characteristics leading to pasteurisation of the composted material will adequately eliminate all salmonella in the final compost product prior to outside storage and maturation. The implementation of hygiene programs within the facility to avoid cross contamination with input material and the vector control program will ensure the biosecurity mitigation program is optimal for salmonella.
During the transient start-up period of a recently filled TCS it is expected that the biofilter will reduce the input salmonella burden output bioaerosol by over 90% using the correct biomass in the biofilter.
It is also to be noted that the work done by Blackall 2010 and Chinivasagam 2010, determined that salmonella did not appear to survive well in aerosols.

Botulism requires consideration both in the input material, during the pasteurisation process in the ORF and also the final product. Bohnel and Lube, 2000 emphasise the potential health risks to humans and animals due to *Clostridium botulinum* in bio-waste. The publication by Berge, et. al. 2009, contains detailed material regarding the microbial risks in composting material including *Clostridium botulinum,* spore production and potential toxin production, botulism. It discusses that the early temperature increase in the composting process results in reduction of the bacterium but there is spore release and potential toxin production but as the temperature continues to increase there is a reduction in spores and toxin. The micro environment, nutrients available, increasing aerobic conditions and the compost pH also contribute to the decline in the bacterium inability of the spores to geminate and the inactivation of toxin. It is important that there are no "cold" spots in the process to allow the persistence of potential bacterium and spores with germinating potential from composted material.

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Avian Ectoparasites and Litter Beetles: The main spread of ectoparasites will be by reuse of vehicles and cross contamination of vehicles and this is covered in **Section 8**.
The time and temperature parameters achieved in the TCS are adequate to inactivate avian ectoparasites.

7.5 Liquid Waste/ DAF Sludge and Grease Trap materials

The biosecurity risks of liquid waste / DAF sludge and Grease Trap materials is again dependent on the sources involved. The liquid waste and Grease trap material are not considered a biosecurity risk for intensive animals.

Biosecurity risk assessment: should be considered dependent on species source and mitigation procedures as for **Sections 7.3 and 7.4.**
While an issue potentially of noncompliance the source of DAF material should ensure that it does not have a component of human waste. This introduces work place safety considerations for the transportation and handling of the raw material.

7.6 Poultry Litter

Poultry litter and poultry manure is a common waste product of poultry production in Australia and is generated annually from the production of over 572 million broilers, 17 million layers, poultry rearing and breeding stock and over 14 million ducks and turkeys. The product is either used as a raw material for composting or processed by some form of bioremediation being a valuable source of sustainable fertiliser to the horticultural industry. Due to the large volume of material generated annually, there are extensive and well established logistical activities for moving this product throughout the poultry industry to the various sites for disposal. The commonly used process involves poultry litter and manure being stored temporarily before direct application to pastures, crops or other horticultural activities. This may occur on properties within the immediate vicinity of the poultry farms or at some limited distance away from the farms. The cost of transporting such low-density material puts financial limitations on the distances it can be moved.
Poultry mortalities as carcasses are disposed of in a variety of ways including on site burial or composting, commercial contractors, rendering plants or bioremediation plants. The former practices of burial or composting on site is becoming not the preferred option of responsible authorities.

Biosecurity Risk Assessment: this material is a high risk because it reflects the status of the poultry from which it was derived, there are very large volumes of it and it transportation and handling generates dust which acts as a physical airborne carrier of pathogens. The biosecurity risk assessment is as for **Section 7.4**.
The additional aspect is the potential aerosol and windborne spread of the litter. The mandated movement of poultry litter in sealed tucks until receipt within the receival building of the ORF will mitigate these concerns.
The aerosol of poultry litter receival dust within the facility will be expected to cross contaminate other raw materials but this is inconsequential as all material in this area is considered contaminated and to be treated accordingly.
The air extracted from this facility would be potentially contaminated and thus should be contained within the facility or extracted through the existing incorporated biofilter system.
When the TCS's are being unloaded all activity moving the poultry litter should cease.

8.0 Vehicular movements

The proposal should be to use fully covered and sealed vehicles which will contain the waste material within the truck until discharge at the processing site. This secure movement of waste in an enclosed vehicle has a much lower biosecurity risk than for example the transfer of live poultry in open sided trucks. Live poultry transport occurs regularly in the region with the movement of grown meat chickens, layer pullets and spent layer hens.
This type of containment of poultry waste during transport is advantageous to existing standard practices of transporting materials in uncovered trucks and live poultry in open sided vehicles.
The difficult compliance areas include:

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- Drivers
    - This is an area where it is always expected that there will be challenges to operational procedures and guidelines.
    - There will be a need to create some basic and simple language SOP's supported by diagrams outlining the fundamentals of biosecurity.
    - In association with the OH & S induction that are mandated for all contractors operating in the work place a biosecurity induction should be incorporated.
    - The highest risk with drivers is footwear and clothing. The use of protective over boots or protective clothing will be difficult to enforce and implement based on industry experience.
    - The compromise here is to establish restrictive movement zones within the receival facility that are clearly marked by line markings and signage. Such markings are typical in work places now for secure movement of workers through vehicular movement areas such as fork lifts.
- The internals of the cartage vehicles between visitations to the ORF
    - No cleaning activity will occur at the facility as it would require designated washing areas, liquid waste disposal systems and recovery and chemical usage. The internal status of the truck is equivalent to the delivered material.
    - It is important that unloading equipment and activity does not result in cross contamination with the pasteurised product.
- The movement of drivers and vehicles within the receival facility where there is the potential for cross contamination of drivers, truck internals and truck wheels.
    - This can be avoided by designated offloading areas in the receival areas and ongoing program of dry cleaning and wash down.

Overall the proposed ORF would not add any detrimental aspects in regard to biosecurity and vehicular movements to that which already happens with waste procurement and disposal in the Tamworth Region. The potential for increased admixture of different waste material at the site should though be considered to put protocols in place to limit cross contamination.

9.0 Biosecurity Mitigation, Hygiene, Cross Contamination between input and Output Material

The design of the facility as stated in **Section 6.1** that: The tunnel processes comprises two stages for pasteurisation (14 days) and composting (14 days). After the first stage, the tunnel batch would be loaded into another tunnel for the second stage of processing; and material will be pasteurised (55-65°C) to destroy pathogens and denature weed seeds.
The proposed ORF would be required to meet AS: 4454 2013 conditions as detailed Appendix O; Section O5: In-Vessel (Bioreactor) Horizontal Configuration. Item (e)*Temperature*.
With a central corridor there thus is a need to bring "pasteurised" material out of a TCS using front end loaders and manoeuvring this partly treated material into another TCS for the second period of treatment. The risk consideration being that this partly treated material will be contaminated by raw input material across the corridor floor. A biosecurity assessment of this operational procedure is:

- The movement of raw materials into TCS's should be done in such a way that this involves loading directly from the raw material store / pit /bin in the receival room by a "loader" without placing any material on the corridor floor.
- The loader(s) should be designated "dirty" and "clean" with:
    - Dirty loader just for raw material and the Clean loader for 1st and 2nd Stage Pasteurised material.
        - While it would be optimal to have designated loaders for input materials and output (pasteurised) material it is recognised that facilities similar to the proposed ORF more often share the loader use. This is for logistical limitations, spatial movements, physical room in the corridors and possibly OH & S.

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        - Noting the primary intentions of the ORF is the production of pasteurised and pathogen free compost material, it is important that cross contamination of potential pathogen containing input material with Stage 1 and 2 tunnel composted material does not occur.
        - Where one loader is used or there is cross usage of loaders for input and output materials, there will need to be the consideration of developing SOP and WI to mitigate the risk of cross contamination. WI would include the strategic use of the loader for "dirty" and "clean" material, risk assessment of particular input material, and clean down and pathogen reduction activity of the loader prior to use on Stage 1 and 2 composted material.
- The corridor floor after raw material loading, to remove the minimal spillage, is dry cleaned and washed
    - Clean loader only enters after this activity.
- Wheel washing of the Dirty loader occurs in a designated area in the receival room.
- Wheel washing of the Clean Loader while less critical occurs in the corridor after removing 1st Stage material prior to the corridor being cleaned and washed.
    - The use of detergents and disinfectants will need to be evaluated in regard to the runoff water as its use cannot impede any of the composting activities. Its direction into the second leachate dam may be an option. There needs to be the hygiene considerations in the design of the concrete floor. This particularly applies to the floors of the TCS's and corridor
    - It is a non-slip (rough trowel finish) but a surface that can be readily and physically cleaned.
    - There are to be no cracking or unsealed expansion joints in the concrete.
    - The concrete surface is treated with a silicone seal product such as Con-Treat® (Densi-Crete) which is a relatively low cost easy application products that that permanently waterproof the floor.
        - There are other suitable alternatives.
        - This is required because bacteria like salmonella can and do penetrate the pores of concrete and other porous surfaces and remain viable for long periods.

10.0 Wild birds, vermin and flies

The proposed facility being enclosed provides significant advantages with wild bird and vermin control when compared to existing practices of land fill, storing or spreading as currently occurs in the region.
Rodent control programs need to based on first principles and responding to what the site situation requires. As in **Section 7**, there is a need for a rodent and pest control plan developed for the ORF site by person(s) qualified and experienced in rodent and pest control and record keeping that shows active and ongoing monitoring of rodents, bait stations and other nominated control strategies. Information to develop such programs are readily available with an example being, Code of Practice for the Prevention and Control of Rodent Infestation on Poultry Farms, DEFRA, 2009. Fly control should be assisted by the continued throughput of material from receivals and the incorporation of attractant fly bait surface sprays like Agita® 100 Plus Fly Paint-on.
Wild birds if congregating around the outside maturation compost pads are considered a very low (Figure 1.) biosecurity risk and lower than that of the less secure existing practices of landfill, outside composting and pasture and crop spreading. The composted material is also expected to contain minimal material that would be an attractant to wild birds.
In regard to other wild animals including foxes, pigs there is a requirement is to ensure that the facility is enclosed with suitable secure fencing and entrances to the facility are secure during nonoperational hours.

The development of SOP's would ensure best practice methods are used to control wild birds, flies and vermin.

Figure 1. provides an overall Biosecurity Risk Matrix for the ORF

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Biosecurity Risk matrix for composted waste and poultry pathogens					
	Probability				
Consequence	Very Low (Extremely unlikely)	Low (Possible but not very likely)	Medium (Occurs occasionally)	High (Occurs often)	Very high (Occurs more often than not)
Negligible (Very little impact)	Very low risk	Very low risk	Very low risk	Very low risk	Low risk
Minor (Impact on sensitive site due to pathogen spread)	Very low risk	Very low risk	Very low risk	Low risk	Moderate risk
Moderate (Multiple sites in a region affected by some business loss due to pathogen spread)	Very low risk	Very low risk	Low risk	Moderate risk	High risk
Significant (More than one region affected by some loss or a region with total shut down of business due to pathogen spread)	Very low risk	Low risk	Moderate risk	High risk	Very high risk
Severe (Multiple regions with total shut down of business due to pathogen spread)	Low risk	Moderate risk	High risk	Very high risk	Very high risk

Figure 1: Biosecurity Risk Matrix for Composted Waste and Poultry Pathogens

11.0 Respond to the Request for Information (RFI) by the NSW DPI (Agriculture) on eight (8) points; with a particular emphasis on biosecurity.

11.1 *The Hazard and Risk Report (Appendix L) of the Environmental Impact Statement for the proposed Tamworth Organics Recycling Facility does not adequately address biosecurity risks which are specific to intensive livestock production and in particular to the adjacent intensive poultry meat production facility owned and operated by ProTen.*

Response: Biosecurity risks covered in **Section 7** and specific reference is made to the biosecurity risks of the broiler complex operated by ProTen located 500 metres from the proposed ORF.

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11.2 The literature review of bioaerosol risk by Todorski Air Sciences was focused on bioaerosol and pathogen dispersion risks associated with human health impacts but not for intensive animal production systems.

Response: Bioaerosol risks for intensive animals, including poultry are covered in **Section 7** and in particular **Section 7.4.** The microbiological bioaerosols of biosecurity concern are not those that are intrinsic to the biofilter biomass but the those that contain the pathogens that may be associated with the original raw input material. Provided the TCS operates as prescribed then there will be a substantial reduction in pathogen load in the TCS within the first 1 to 4 days depending of the pathogen involved and the nature of the materials. In correspondence from the Tamworth Regional Council: "*APBTC have confirmed: "The time it takes to reach 55°C depends on the inherent microbiological activity of the final feedstock mix. So, if we look at FOGO/GO only, it takes around 3-4 days assuming a moisture content post shredding/moistening of around 50-60%. However, if we look at your feedstock variety and composition which includes other high nitrogen containing waste (paunch etc) temperature will go up faster. So, you may find that 55°C is achieved within 24 hours of starting the tunnel process. We also find that moving the pasteurisation period towards the end of the (e.g. 14 days) process has usually advantages re nitrogen conservation, process water recycling etc. so we usually first compost the material at lower temp before we move up to pasteurisation temp.*
As far as the pathogen destruction is concerned, again it will depend on the final feedstock characteristics. Our technology makes provision for a distinct pasteurisation period during which the temp is elevated to 60°C temperature (thus guaranteeing that temp is above 55°C anywhere inside the tunnel at all times). With FOGO only, we have proven, that 4 days are sufficient at that temperature to guarantee destruction of pathogens, with other critical feedstock we may select to extend that period. But pasteurisation temperature and duration will be determined during commissioning".
The above must be compliant with the conditions AS: 4454 2013 and the US EPA Part 5 Biosolids Rule 1994 as covered in **Sections 7 and 9**.
For the majority of the operating period of 28 days it is expected that the pathogen load will be inactivated. It is only during that first period of operation until the bulk of the input material reaches 55°C plus that there is expected to be a potential pathogen load entering the biofilter. Peer reviewed publication indicate that with the correct type of material and proportional blend in the biofilter that the bacterial pathogen and endotoxin load will be reduced by over 90%. While no prescriptive data was found the literature did imply and it is the authors first principle understanding of biofiltration including HEPA filters that it is expected that the air movement, biofilter materials and the biological and chemical environment in the biofilter would result in the inactivation of viruses because of shear forces and local environment.

11.3 The review by Todorski indicates that 'bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind where the bioaerosols would be diluted by approximately 1,000 times less than the level at the source'. However, several other studies show the presence of bioaerosols at much greater distances:

- Recer, G.M., Browne, M.L., Horn, E.G., Hill, K.M., and Boehler, W.F.(2001). Ambient air levels of Aspergillus fumigatus and thermophilic actinomycetes in a residential neighbourhood near a yard-waste composting facility. Aerobiologia 17, 99–108.doi:10.1023/A:1010816114787
- *Kampfer, P., Jureit, C., Albrecht, A., and Neef, A.(2002). "Imission of microorganisms from composting facilities" in Microbiology of Composting ed S. Klammer (Berlin: Springer),571–584.*
- *Fischer, G., Muller, T., Ostrowski, R., and Dott, W.(1999). Mycotoxins of Aspergillus fumigatus in pure culture and in native bioaerosols from compost facilities. Chemosphere 38, 1745–1755.doi:10.1016/S0045-6535(98)00391-9*

Response: The articles by Recer et. al., Kampfer et. al and Fischer et. al. specifically deal with large scale outside composting which is not applicable to the proposed ORF where the first 28 days of composting is enclosed and all emissions going through a biofilter and as discussed in **Section 11.2**

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under this system there is both a significant to complete reduction of pathogens both in the preliminary composting and containment / inactivation of residual pathogens in the biofilter. This has significant advantages over current existing practices by the responsible authority and industry in the region of open air composting. For the second stage outside maturation at the proposed ORF the absence of potential intensive animal pathogens means that the biosecurity risk from passive movement bioaerosols is not present.
This is dependent on Stage 1 of the ORF process meeting the conditions outlined in AS: 4454 2013 and the US EPA Part 5 Biosolids Rule 1994, Appendix O, Section O5. Monitoring should at prescribed intervals be undertaken of Stage 1 and Stage 2 material to ensure pathogen reduction has occurred and thus pasteurisation conditions are met as outlined in AS: 4454 2013; Definitions 1.5.8 and 1.5.9

Exogenous (associated with the input material) and endogenous (produced on site within the biofilter or maturing composted material) production of *Aspergillus fumigatus* needs to be considered as a bioaerosol health risk within the holding facility and dispersed from the facility.
It is recognised currently that normally within the environment and because of other agricultural activity such as cropping, grass hay cutting and storage, silage production and outdoor composting there is the endemic presence of *Aspergillus fumigatus*.

It is noted that the paper by Recer, et. al compares the background spore count in a residential neighbourhood not to that of an agricultural area with extensive vegetation, cropping or broiler farm emissions where composting deep litter is used, such is the situation with the proposed ORF.
The paper by Kampfer et. al. was again about evaluating open air composting in residential areas with nearest sensitive sites being 150 to 1,200 metres away.

Review of the literature and the expert's familiarity with the epidemiology of the disease aspergillosis in poultry provides evidence that the proposed composting site under normal operational conditions will be highly unlikely to increase the risk of aspergillosis at the broiler farm. Peer reviewed literature indicates that the aspergillus that may be causally associated with the maturing compost would remain within the vicinity of the site and the presence of aspergillus at the location of the broiler farm would not be discernible different from that which is normally found environmentally. Research has shown that even under conditions where air is expelled at force from a source, such as extraction fans on a broiler farm, bacteria (which disperse more widely than fungal spores) have only a quantitative impact up to a maximum of 400 metres (Haines, 1995; Deacon et. al., 2009; Blackall, et. al., 2010, Chinivasagam, et. al., 2010)

11.4 The literature review did not provide a risk assessment of bioaerosols and pathogens of relevance intensive poultry meat production.

Response: this has been covered extensively in **Sections 7.2 to 7.6**.

11.5 Other literature sources suggest that the dispersion of bioaerosols that are pathogenic to humans and livestock may be greater than provided in the literature review by Todorski Air Sciences in Appendix L. See for instance J.P.G. Van Leuken, A.N. Swart, A.H. Havelaar, A. Van Pul, W. Van der Hoek, D. Heederik, Atmospheric dispersion modelling of bioaerosols that are pathogenic to humans and livestock – A review to inform risk assessment studies, Microbial Risk Analysis, Volume 1, 2016, Pages 19-39

Response: Continuation to discussions undertaken in **Section 11.2** As in the article by Van Leuken et. al. there is extensive normal ongoing activity producing bioaerosols in the natural environment and from the agriculture industries in the Tamworth region and also the "pathogenicity to cause disease is dependent on the pathogen's infectivity, and its ability to be transported and survive". In the case of the proposed ORF we are referring to bioaerosols being emitted from a biofilter after there has be significant and near complete reduction of pathogen load and is further reduction of any residual load through the physical and chemical activity. Thus, while the dispersion modelling is as indicated by Van Leukin et. al. from the biofilter expected to be comparable we are not dealing with a comparable animal and human pathogen biosecurity risk. This also applies to the stockpiled maturation compost material.

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11.6 *The EIS and Appendix L did not address the potential for reinoculation of the maturing 'outside' compost piles by pathogens of relevance to intensive poultry production and which may subsequently pose a risk to the adjoining poultry meat farm. The nearby presence of the leachate dam may be a potential source of reinoculation of maturing compost piles, potentially aided by animal, insect or other windborne vectors.*

Response: Reinoculation of the maturing 'outside' compost piles by pathogens of relevance to intensive poultry is discussed in **Sections 9**.
The leachate from the TCS's is confined to sealed tanks and recirculated back through the composting system.
The leachate dam receiving seepage or run off from the outside stored maturing compost will have the same status of the compost itself and as such will not pose any significant pathogen reinoculation biosecurity risk. The leachate dam will be securely fenced to restrict wild or domestic animal access.
Insect vectors will be endemic to the region, noting the contained and secure nature of the facility and thus provide no additional biosecurity risk through potential pathogen transfer. The aerosols from the receival room which are collected and ducted through the biofilter will not be a particulate windborne source of contamination to maturing compost and the biosecurity risk assessment of other windborne external sources contaminating the maturing compost is very low.
In the event that the adjoining ProTen had an ILT outbreak then the windborne movement of virus to the maturing compost is numerically low and the survivability of the virus limited.
It has also been confirmed in the design of the facility "all excess air from both the tunnels and the main receival hall will operate with an air extraction system. The system will utilise ducts to draw air into the biofilter fan and further blown through the humidifier to the biofilter".
This will aid in the mitigation of the following:

- Once the input material has been securely received any pathogens associated with material with be confined within the container receival room and any bioaerosols containing pathogens will be extracted and passed through the biofilter.

The O H & S concerns of having a well ventilated workplace (receival area) with the consideration of acceptable levels of the human health pathogens including *Aspergillus fumigatus, Legionella pneumophila* and endotoxins are addressed.

11.7 *The EIS and Appendix L did not provide sufficient information about wild bird, insect and animal vector controls e.g. rodent, bird, insect and animal control measures to reduce the potential for spread of disease from the facility.*

Response: Information about wild bird, insect and animal vector controls is covered in **Section 10** of the Expert Report

11.8 The risk assessment has not addressed the risks posed by endemic Infectious Laryngotracheitis (ILT) in the Tamworth region and the potential of spreading ILT to the neighbouring poultry meat farm. This is particularly a risk given the receipt of material of poultry origin at the proposed facility.

Response: The risk assessment regarding ILT and the adjacent ProTen poultry operation and mitigation procedures are discussed in **Section 7.4**, Poultry Viral Diseases.

12.0 RECOMMENDATIONS

There is a requirement to develop a series of SOP's and WI to cover the following areas:

- Operational and technical aspects of the bioremediation process ensuring optimum processing parameters and temperatures are achieved. With the aim of destroying all the pathogens of concern at the intended processing temperatures. The incorporation of real time monitoring of operating temperatures and residence times is a requirement.

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- As well as point of time pathogen testing of finished material. EPA usually requires AS 4454 sampling/testing to confirm PA destruction and AS 4454 compliance for a pasteurised product.
- Guidelines for the secure transport of poultry waste from poultry sites to the processing facility. This should include on farm movement of material to the truck, containment of the load, assessment of vehicular hygiene, traceability of movements and adherence to biosecurity protocols and principles.
- SOP's and WI regarding the use of loaders for the handling and movement of input waste and output (pasteurised) materials and minimising cross contamination.
- Formal training of responsible staff in biosecurity practices
- Environmental Management Plan (EMP) for the proposed site.
- Environmental Risk Assessment (ERA) that includes contingencies for changes in the regional disease status.
- For the finished matured composted material and its subsequent use there is a need to ensure that there is compliance around legislation such as that for Rendered Animal Material (RAM) and the awareness of the potential residual risk of botulism in regard to human and animal health. In regard to botulism and other potential pathogens the concerns about these risks can be mitigated by operational monitoring of the ORF and the parameters required for effective pasteurisation reinforced with testing as required by AS: 4454 2013

13.0 CONCLUSIONS

A biosecurity assessment of the proposed ORF was undertaken with particular emphasis on those pathogens affecting intensive animals, including poultry.
The technology of Tunnel Ventilation Composting was identified to be superior to the existing activities of land fill and open air composting undertaken within the Tamworth region in regard to pathogen reduction and containment.
Under the proposed operational procedures involving material inputs, enclosed receival area, composting treatment and storage of pasteurised product for maturation it is the opinion of the author that the additional risk of an avian pathogen incursion into the ProTen broiler operation compared to other existing horizontal contacts is very low to low (Figure 1) provided that the above recommendations are implemented.
Similarly, the matured compost product will be an improved outcome to current practices provided its utilisation has the appropriate restrictions applied around its best practice use.

14.0 STATEMENT AND DECLARATION

- This report examines the biosecurity risk of a proposed waste treatment facility.
- I, Dr Peter Scott declare I have made all the enquiries which I believe are desirable and appropriate and no matters of significance which I regard as relevant have, in my knowledge been withheld.

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Managing Director
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Peter C Scott

From: Adam Bishop <abishop@pittsh.com.au>
Sent: Wednesday, 27 November 2019 10:19 AM
To: byron.stein@dpi.nsw.gov.au; Peter C Scott
Cc: Jessica Berry; Mather, Megan
Subject: RE: FW: DA2020-0138-284, Organic Recycling Facility, Gidley Appleby Road, Gidley

Hello Byron,

It was nice to talk to you this morning. As discussed, I would like to convene a teleconference discussion between DPI, Biosecurity Australia, our expert (Peter Scott) and Council.
The purpose would be to discuss the outstanding issues and clarify DPI's requirements.
You indicated this Friday would suit.
Please can you check with your colleague/s and I will check with Peter.

Cheers, Adam.

pitt&sherry | Adam Bishop

Principal Environmental Consultant

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From: Byron Stein [mailto:byron.stein@dpi.nsw.gov.au]
Sent: Tuesday, 5 November 2019 12:26 PM
To: Mather, Megan
Cc: Kate Wingett; Paul Garnett; Corryn Hatch
Subject: Fwd: FW: DA2020-0138-284, Organic Recycling Facility, Gidley Appleby Road, Gidley

Dear Megan,

Thank you for your time on the telephone this morning. As discussed NSW DPI recommends that Tamworth Regional Council seeks independent advice on animal biosecurity risks and mitigations from someone with expertise in poultry biosecurity. It is recommended that a suitably qualified expert with expertise in poultry biosecurity undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks.

Attached is a list of consultants we are aware of that may be able to assist you. Please note that this is not an exhaustive list and that other consultants may be equally qualified to assist you. However, the attached list is simply the consultants that we are aware of that have the appropriate industry and technical expertise to assist you with your application.

Rationale:
1. The Hazard and Risk Report (Appendix L) of the Environmental Impact Statement for the proposed Tamworth Organics Recycling Facility does not adequately address biosecurity risks which are specific to

intensive livestock production and in particular to the adjacent intensive poultry meat production facility owned and operated by ProTen.
2. The literature review of bioaerosol risk by Todorski Air Sciences was focused on bioaerosol and pathogen dispersion risks associated with human health impacts but not for intensive animal production systems.
3. The review by Todorski indicates that '*bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind where the bioaerosols would be diluted by approximately 1,000 times less than the level at the source'*. However, several other studies show the presence of bioaerosols at much greater distances:

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- Fischer, G., Muller, T., Ostrowski, R., and Dott, W.(1999). Mycotoxins of Aspergillus fumigatus in pure culture and in native bioaerosols from compost facilities. Chemosphere 38, 1745–1755.doi:10.1016/S0045-6535(98)00391-9

4. The literature review did not provide a risk assessment of bioaerosols and pathogens of relevance intensive poultry meat production.
5. Other literature sources suggest that the dispersion of bioaerosols that are pathogenic to humans and livestock may be greater than provided in the literature review by Todorski Air Sciences in Appendix L. See for instance J.P.G. Van Leuken, A.N. Swart, A.H. Havelaar, A. Van Pul, W. Van der Hoek, D. Heederik, Atmospheric dispersion modelling of bioaerosols that are pathogenic to humans and livestock – A review to inform risk assessment studies,
Microbial Risk Analysis, Volume 1, 2016, Pages 19-39
6. The EIS and Appendix L did not address the potential for reinoculation of the maturing 'outside' compost piles by pathogens of relevance to intensive poultry production and which may subsequently pose a risk to the adjoining poultry meat farm. The nearby presence of the leachate dam may be a potential source of reinoculation of maturing compost piles, potentially aided by animal, insect or other windborne vectors.
7. The EIS and Appendix L did not provide sufficient information about wild bird, insect and animal vector controls e.g. rodent, bird, insect and animal control measures to reduce the potential for spread of disease from the facility.
8. The risk assessment has not addressed the risks posed by endemic Infectious Laryngotracheitis (ILT) in the Tamworth region and the potential of spreading ILT to the neighbouring poultry meat farm. This is particularly a risk given the receipt of material of poultry origin at the proposed facility.

Please don't hesitate to contact us if you wish to discuss this further.

Kind regards

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CURRICULUM VITAE

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Date of Birth: 30th June 1954

Historical Perspective

1974	B. Sc	University of Melbourne, Australia
1979	B.VSc (Hon)	University of Melbourne, Australia
1989	Ph.D	University of Melbourne, Australia
1979-1980		Private Practitioner, Mixed Practice, Victoria, Australia
1980		Veterinary Pathologist Veterinary Research Institute Victorian Department of Agriculture, Australia
1980-1981		Veterinary Pathologist / Researcher Regional Veterinary Laboratory Victorian Department of Agriculture Benalla - Victoria, Australia
1981-1989		Avian and Mammalian Pathologist / Researcher Veterinary Research Institute Victorian Department of Agriculture, Australia
1985-1989		Postgraduate Studies into the "Genetic Organisation of the Ovine Major Histocompatibilty Complex (MHC) Class II Region"
1997→ 2015		Senior Research Fellow, Coordinator of Applied Research, **Veterinary School, University of Melbourne, Australia.** http://research.vet.unimelb.edu.au/staff.php?staffID=707

Current Positions

1989→	Managing Director of **Scolexia Pty. Ltd.** Animal and Avian Health Consultancy. www.scolexia.com
2003→	Partner and Director; **Pacific Agriculture,** Commodity Trading Company
2005→	Partner; **Ace Laboratory Services**, Diagnostic Laboratory services www.acelabservices.com.au

2013→	Partner / President **9 Ace Global Technologies**, Diagnostic Laboratory Services and Autogenous Bacterial Vaccines, www.aceglobaltechnologies.com
2015→	Associate Professor, **Veterinary School, University of Melbourne, Australia**

Areas of consultancy:

Intensive Animal Industries (Australian and International)

Poultry, pigs and ruminant

Aquaculture - Biosecurity

Pharmaceutical, Biological and Chemical Industries

Supply Industries and Industrials

Export and Import

Financial, Planning and Administration

Legal

Expert Witness

Biosecurity audits Insurance Underwriters

Educational Institutions

Government

Media

Past and Present Expertise in Government Policy and Development

- Technical advice and implementation of strategies to assist government departments in the control and reporting of both endemic and exotic diseases.
- State ministerial appointment to the Victorian Broiler Code Committee to provide technical advice of industry.
- Member of Consultative Committee on Emergency Animal Diseases (CCEAD), National Animal Health Laboratory Strategy, Newcastle Disease Consultative Committee, FSANZ Technical Group,

- Provision of advice both on an informal and formal basis to Biosecurity Australia, Animal Health Australia, Australian Pesticides and Veterinary Medicines Authority, etc.
- Commissioned by Department of Agriculture Fisheries and Forestry (DAFF) to undertake several reports on intensive animal industry structure and dynamics and advice on policy in regard to passive and active surveillance for avian influenza and how it relates to OIE policy.
- Avian Expert Advisory Group: Use of physical containment Level 3 for avian imports at the proposed new government quarantine facility.
- Consultancy Australian Defence Department.
- Department of Agriculture - Export

Expertise in the Intensive Livestock Sector and delivery of Animal Health Services:

- Project management of various types of poultry and intensive animal enterprises including the sourcing of land, feasibility studies, planning, geotechnical and environmental services, landscaping, construction and facilitation. http://scolexiaprojects.com.au
- Oversee the facilitation and husbandry aspects of poultry used for the production of fertile eggs for human influenza vaccine production. Technical advice in various aspects of procedures and facilitation for the manufacture of human influenza vaccine.
- Business management to various poultry companies particularly where involved in company restructuring, financial management and transfer of ownership.
- Advisory services to the equine industry, ruminant livestock and poultry industry.
- Provision of pathology diagnostic services.
- Interrelationship with academics in assisting in the obtainment and interpretation of experimental data.
- Nutritional advisory support services to a number of livestock and feed milling establishments, predominantly in the technical aspects of formulations, testing of raws and in feed additives.
- Commodity trading in feed ingredients including domestic trading, futures markets and hedging in both physical and currency.
- Development and trialling of animal vaccines, feed additives and supplements
- Liaison with unions and other worker representative groups.
- Undertaking of various quality assurance programs and staff training.
- Development of husbandry manuals and articles for intensive livestock.
- Development and implementation of vaccines in the field.
- Development and testing of pharmaceutical products and disinfectants.
- Seminar programmes for various livestock industries.
- Responsibility for overseeing the management and development of husbandry and production programmes for both broiler breeders and parent egg breeders in the poultry industry.

- Input into genetic selection programmes, particularly for adapting strains of birds to regional nutritional variation and disease susceptibility.
- Legal representation and advice for various livestock species and their associated inputs, husbandry and welfare.

Memberships: -

Australian Veterinary Poultry Association
World Poultry Science Association
American Association of Avian Pathologists
Australian Association of Veterinary Pathologists

Current Industry Positions:

Technical Advisor Australian Egg Corporation
R & D Committee Australian Egg Corporation Ltd
Consultative Committee for Emergency Animal Diseases (CCEAD).
National Animal Health Strategy
Newcastle Disease Consultative Committee
Avian Influenza Surveillance Committee
Expert Advisory Group on proposed Post Entry Quarantine facility
Various other Industry Committees.

Academic Positions:

Associate Professor, Veterinary School, University of Melbourne, Australia. Coordinator of Applied Research at the Asian Pacific Centre of Animal Health
http://research.vet.unimelb.edu.au/staff.php?staffID=707

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APPENDIX 3

office address: 8/19 Norwood Crescent, Moonee Ponds, Victoria Australia 3039
postal address: 16 Learmonth Street, Moonee Ponds, Victoria Australia 3039
telephone: +61 (0) 3 9326 0106 facsimile: +61 (0) 3 9372 7576 email: info@scolexia.com.au

Peter C Scott

From: Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent: Tuesday, 5 November 2019 3:22 PM
To: 'pscott@scolexia.com.au'
Subject: Tamworth Organic Recycling Facility - Seeking Independent Advice - Biosecurity Risks

Hi Peter,

Thank you for speaking with me briefly.

As mentioned, Tamworth Regional Council have submitted a development application for a proposed Organic Recycling Facility, which utilises a Tunnel Composting System technology and designed to process initially up to 35,000tpa of a range of organic materials, including Food and Garden Organics and Category 3 organics.

The Tamworth region is supported by a large agricultural industry and the proposed site is located adjacent to an operational poultry farm, owned by ProTen. The DPI has raised some concerns regarding the proposal and has requested further information be provided in order to allow for an evidence based assessment. Please see link for project information:
https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

DPI – Ag has requested information related to the proposal and has recommended that Council seek independent advice from a suitably qualified expert with expertise in poultry biosecurity to undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks.

Council had hoped that this project would be referred to the Joint Regional Planning Panel in early December 2019, which would mean that all issues would have to be resolved prior to the end of next week. This we understand is highly unlikely, although Council would still like to ask the question as to if you may be able to provide these services for review / assessment with approximate cost estimates for the works?

Or please advise the that the works can not be completed at a fast tracked pace, in which case, can the works be completed prior to 18 December 2019?

Happy to discuss further at your earliest convenience.

Thank you,
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth REGIONAL COUNCIL

Peter C Scott

From: Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent: Wednesday, 6 November 2019 4:16 PM
To: 'pscott@scolexia.com.au'
Subject: Tamworth Organic Recycling Facility - Additional Information - Biosecurity Risks

Hi Peter,

Thanks for speaking with me, please see below (and link at very bottom of email for Large File Transfer) and attached for additional information.

Objections received during Public Exhibition phase (70 total), 30 September 2019 – 28 October 2019:

- Approximately half were 'copy / paste' letter and signed by different individuals:
  - Of these, most were incomplete i.e. missing addresses, numbers etc. so can not be included in 'formal' final figure.
- I've been advised that the comments and summary of issues are still being collaborated by our Planning & Compliance assessing officers and they are unable to disclose specific concerns raised by any one particular party.
  However, from previous community engagement, primary issues would be:
  - Air Quality – odour, dust, bioaerosols;
  - Biosecurity – attraction of birds to outdoor maturing stockpiles, rodents, control of weeds and site management;
  - Traffic Impacts;
  - Water Management – on-site management and containment, water access and sources;
  - Devaluation to neighbouring properties.

Referral responses: I've been advised that Council's Planning & Compliance directorate expect to receive outstanding responses by early next week at the latest.

Input Organic Materials and quantities are estimated as follows (2017/2018 data):

Input	Quantity (tpa)	% of Total	Comments
FOGO	12,500	36	FOGO Kerbside service anticipated to commence under new Waste Collection Contract - 1 July 2021
Greenwaste	9,000	26	Figure considered conservative with ongoing drought conditions can be up to 14,000tpa
Timber	1,600	5	
Paunch	3,800	11	Currently processed with Greenwaste
Offals	3,450	10	I've been advised that Council does not capture data on offal products into specific categories through the weighbridge i.e. poultry, beef, sheep etc. rather all just classified as offals as they are buried in the same offal pit(s). However, if this is insufficient, I can request specific customer transaction details and backtrack through to determine specifics, just note, this would take some time.
Liquid Waste	2,250	6	
DAF Sludge	2,400	7	
Total	**35,000**	**100**	

Vehicle Types Accessing the proposed facility include:

Vehicle Type	Vehicle Length	Receivals / Dispatch
Kerbside Collection Vehicle	6.5 and 10m	Receivals Only

Dual Axle Tipper	9m	Receivals and Dispatch
Semi-Trailer Tipper	15m	Receivals and Dispatch
Truck and Trailer Combination	18m	Dispatch Only
Quad Dog and Trailer	20m	Dispatch Only
B-Double Truck	26m	Dispatch Only

DPI – Agriculture's request and Rational – that a suitably qualified expert with expertise in poultry biosecurity undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks.

Rationale:

1. The Hazard and Risk Report (Appendix L) of the Environmental Impact Statement for the proposed Tamworth Organics Recycling Facility does not adequately address biosecurity risks which are specific to intensive livestock production and in particular to the adjacent intensive poultry meat production facility owned and operated by ProTen.
2. The literature review of bioaerosol risk by Todorski Air Sciences was focused on bioaerosol and pathogen dispersion risks associated with human health impacts but not for intensive animal production systems.
3. The review by Todorski indicates that '*bioaerosols from the composting facilities decline to background levels at distances between 150 to 500m downwind where the bioaerosols would be diluted by approximately 1,000 times less than the level at the source'.* However, several other studies show the presence of bioaerosols at much greater distances:
    - Recer,G.M.,Browne,M.L.,Horn,E.G.,Hill,K.M.,and Boehler,W.F.(2001). Ambient air levels of Aspergillus fumigatus and thermophilic actinomycetes in a residential neighbourhood near a yard-waste composting facility. Aerobiologia 17, 99–108.doi:10.1023/A:1010816114787
    - Kampfer, P., Jureit, C., Albrecht, A., and Neef, A.(2002). "Imission of microorganisms from composting facilities,"in MicrobiologyofComposting ed S.Klammer (Berlin: Springer),571–584.
    - Fischer, G., Muller, T., Ostrowski, R., and Dott, W.(1999). Mycotoxins of Aspergillus fumigatus in pure culture and in native bioaerosols from compost facilities. Chemosphere 38, 1745–1755.doi:10.1016/S0045-6535(98)00391-9
4. The literature review did not provide a risk assessment of bioaerosols and pathogens of relevance intensive poultry meat production.
5. Other literature sources suggest that the dispersion of bioaerosols that are pathogenic to humans and livestock may be greater than provided in the literature review by Todorski Air Sciences in Appendix L. See for instance J.P.G. Van Leuken, A.N. Swart, A.H. Havelaar, A. Van Pul, W. Van der Hoek, D. Heederik, Atmospheric dispersion modelling of bioaerosols that are pathogenic to humans and livestock – A review to inform risk assessment studies, Microbial Risk Analysis, Volume 1, 2016, Pages 19-39
6. The EIS and Appendix L did not address the potential for reinoculation of the maturing 'outside' compost piles by pathogens of relevance to intensive poultry production and which may subsequently pose a risk to the adjoining poultry meat farm. The nearby presence of the leachate dam may be a potential source of reinoculation of maturing compost piles, potentially aided by animal, insect or other windborne vectors.
7. The EIS and Appendix L did not provide sufficient information about wild bird, insect and animal vector controls e.g. rodent, bird, insect and animal control measures to reduce the potential for spread of disease from the facility.
8. The risk assessment has not addressed the risks posed by endemic Infectious Laryngotracheitis (ILT) in the Tamworth region and the potential of spreading ILT to the neighbouring poultry meat farm. This is particularly a risk given the receipt of material of poultry origin at the proposed facility.

I hope that this information helps and please feel free to contact me should you wish to discuss the matter further.

Thank you,
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Peter C Scott

From: Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent: Friday, 6 December 2019 8:51 AM
To: 'Peter C Scott'
Cc: 'Adam Bishop'
Subject: TRC - ORF Project - Additional Information - Biosecurity
Attachments: Site Locality.pdf; Aerial - Forest Road Landfill complete 19-10-23.pdf

Hi Peter,

- Forest Road Landfill Composting Facility and daily operations:
  - Offal pits are dug into the active landfill cell on a daily basis (excl Sunday);
  - Offal pits are dug directly into waste and typically 4-5m deep. Once offal pits are filled, they are covered with incoming waste (minimum 2m on top) and continued to be filled throughout the day;
  - The landfill cell is covered daily, either with the alternative daily cover (Posi-Shell) or 150mm of clean fill (soil);
  - Measuring of leachate flows occurs from the leachate sump on-site and leachate monitoring is completed in accordance with our EPL;
  - Please see attachments for Maps of Site Locality and Aerial of FRL.

- DAF / Grease Trap
  - Council's Waste Operations Division is currently in the processes of ceasing acceptance (in the new year 2020) of all Liquid Waste at Forest Road Landfill and directing to Westdale WWTP for processing temporarily until the ORF is commissioned.
  - I've received the following advice from our Trade Waste Officer:
    "Liquid trade waste from the Tamworth Region is largely generated from chicken beef and lamb abattoirs and associated protein recovery (rendering) operations. Organic waste from these operations is limited to sludge generated from the Dissolved Air Flotation (DAF) and de watering process or Waste Activated Sludge (WAS) from biological nutrient removal systems. These dry wastes have the disposal options of land application if approved or landfill as a second choice. To a lesser extent there is liquid waste generated from restaurants, fast food outlets, hotels cafes etc. who require a grease arrestor to protect Councils infrastructure. Grease arrestor waste which consists of floating fats oils & grease and settled solids is routinely pumped out and removed by a licenced contractor. This waste is currently taken to the grease trap waste disposal facility at the Westdale WWTP. Settled clear water from the facility in decanted off to the WWTP and the consolidated fats and solids are removed for off site disposal at a licenced facility, which is currently the Cleanaway facility in Newcastle."

- ABPTC – Draft Tunnel Conceptual Process:
  - Page12 - Section 1.4.2: Processing Sequence:
    - The tunnel processes comprises two stages for pasteurisation (14 days) and composting (14 days). After the first stage, the tunnel batch would be loaded into another tunnel for the second stage of processing; and
    - material will be pasteurised (55-65°C) to destroy pathogens and denature weed seeds.
  - ABPTC advised:
    "Given that the tunnel process is a static process, it is necessary to move, mix and break up the material after the first cycle in the tunnel. The material settles and compacts over time. So this is not about any remaining unpasteurised 'pockets' or aeration. We always observe increased activity after a mixing step which fosters further break down, similar to what you can watch in windrows after turning. The bacterial can access fresh food sources.

The material will be/shall be pasteurised after the first cycle and the second cycle would only compost the material in order to increase the level of maturity, typically at lower temperature in order to stimulate the diversification and growth of the type of bacteria (such as fungi which can 'crack' the woody parts containing celluloses and lignin). Without mixing after the first cycle, the material would not achieve the desired degree of maturity."

- Operational handling of raw received materials and out-going materials:
  - My view would be that this may be managed with:
    - procedures to wash down and clean tunnels and areas in contact with wheels;
    - procedures for frequent sweeping of operational areas; and
    - Wheel washes between areas and trafficking pasteurised material out of tunnels to composting pad.

Thank you,
Kind Regards,

Megan Mather |Senior Waste Management Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth
REGIONAL COUNCIL

Peter C Scott

From:	Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent:	Tuesday, 5 November 2019 3:22 PM
To:	'pscott@scolexia.com.au'
Subject:	Tamworth Organic Recycling Facility - Seeking Independent Advice - Biosecurity Risks

Hi Peter,

Thank you for speaking with me briefly.

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The Tamworth region is supported by a large agricultural industry and the proposed site is located adjacent to an operational poultry farm, owned by ProTen. The DPI has raised some concerns regarding the proposal and has requested further information be provided in order to allow for an evidence based assessment. Please see link for project information:
https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

DPI – Ag has requested information related to the proposal and has recommended that Council seek independent advice from a suitably qualified expert with expertise in poultry biosecurity to undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks.

Council had hoped that this project would be referred to the Joint Regional Planning Panel in early December 2019, which would mean that all issues would have to be resolved prior to the end of next week. This we understand is highly unlikely, although Council would still like to ask the question as to if you may be able to provide these services for review / assessment with approximate cost estimates for the works?

Or please advise the that the works can not be completed at a fast tracked pace, in which case, can the works be completed prior to 18 December 2019?

Happy to discuss further at your earliest convenience.

Thank you,
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth REGIONAL COUNCIL

Peter C Scott

From: Peter C Scott <pscott@scolexia.com.au>
Sent: Tuesday, 5 November 2019 4:59 PM
To: 'Mather, Megan'
Subject: RE: Tamworth Organic Recycling Facility - Seeking Independent Advice - Biosecurity Risks

Megan, have noted below and can assist you in the area of biosecurity and beyond:

- Scolexia has worked on an number of similar projects in a number of states on various types of composted material and types of composting methodology.
    - These can be related to planning permits, EPA compliance issues, capital projects, shire expansions, fire risk assessment, etc.
- Material may involve low risk organic vegetable waste, putrescible waste or increased risk material such as poultry litter and avian mortalities, etc.
    - With the concern about ASF and pigs may be also consulting on disposal methods on this matter.
- Currently working on a large capital project using torrefaction and in an area of high poultry concentration.

Can assist and proceed with this for you in a timely manner.

This is a project that is being undertaken by the shire itself?
I have not read all the material yet on the web site but I will require the detail on the technical aspects of the tunnel composting.
More specific detail of the input material.
Are there any formal objections at this stage?

Note Scolexia also has in its technical complement of staff an Environmental and Regulation staff member, historically ex EPA amongst other things and also an Environmental engineer specialising in waste management.

Please ring me on Wednesday to discuss the way forward.

Ta. Peter C.

Dr. Peter C. Scott
Scolexia Pty Ltd
Animal and Avian Health Consultancy

www.scolexia.com.au
www.scolexia.com

Postal Address:
16 Learmonth Street, Moonee Ponds
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pscott@scolexia.com.au

Phone +61 (0) 3 93260106
Fax +61 (0) 3 93727576
Mobile +61 (0) 408 386724

From: Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent: Tuesday, 5 November 2019 3:22 PM
To: 'pscott@scolexia.com.au' <pscott@scolexia.com.au>
Subject: Tamworth Organic Recycling Facility - Seeking Independent Advice - Biosecurity Risks

Hi Peter,

Thank you for speaking with me briefly.

As mentioned, Tamworth Regional Council have submitted a development application for a proposed Organic Recycling Facility, which utilises a Tunnel Composting System technology and designed to process initially up to 35,000tpa of a range of organic materials, including Food and Garden Organics and Category 3 organics.

The Tamworth region is supported by a large agricultural industry and the proposed site is located adjacent to an operational poultry farm, owned by ProTen. The DPI has raised some concerns regarding the proposal and has requested further information be provided in order to allow for an evidence based assessment. Please see link for project information:
https://yourvoice.tamworth.nsw.gov.au/tamworth-organic-recycling-facility

DPI – Ag has requested information related to the proposal and has recommended that Council seek independent advice from a suitably qualified expert with expertise in poultry biosecurity to undertake a HACCP approach to identify potential biosecurity risks at every critical control point of the proposed facility and to identify actions to address these risks.

Council had hoped that this project would be referred to the Joint Regional Planning Panel in early December 2019, which would mean that all issues would have to be resolved prior to the end of next week. This we understand is highly unlikely, although Council would still like to ask the question as to if you may be able to provide these services for review / assessment with approximate cost estimates for the works?

Or please advise the that the works can not be completed at a fast tracked pace, in which case, can the works be completed prior to 18 December 2019?

Happy to discuss further at your earliest convenience.

Thank you,
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth REGIONAL COUNCIL

9

Peter C Scott

From: Mather, Megan <M.Mather@tamworth.nsw.gov.au>
Sent: Friday, 22 November 2019 5:00 PM
To: 'Peter C Scott'
Cc: 'Jessica Berry'; 'Adam Bishop'
Subject: RE: Tamworth Proposal

Hi Peter,

Just letting you know that I haven't managed to gain a response regarding determined tonnages of poultry litter accepted as General Solid Waste.

I'll follow this up early next week to see if there may be a way around it, or potentially may have to consider assessment on a 'worst case scenario'.

I hope you have a great weekend.

Thanks Peter.
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth REGIONAL COUNCIL

From: Mather, Megan
Sent: Friday, 22 November 2019 1:00 PM
To: 'Peter C Scott'
Cc: Jessica Berry; 'Adam Bishop'
Subject: RE: Tamworth Proposal

Hi Peter,

Input material quantities (tonnes) for the last 6 months (end May – November 2019) are as follows:

Table 1: Received Input of Paunch Organics at Forest Road Landfill for the last 6 months.

Paunch Input	Quantity	% of total
Beef	1,027.50	41.77
Beef & Lamb	1,432.64	58.23
Total (t)	**2,460.14**	**100**

Table 2: Received Input of Offal Organics at Forest Road Landfill for the last 6 months.

Offal Input May - Nov 2019	Quantity	% of total
Poultry	2,332.96	98.49
Beef & Lamb	35.84	1.51

Total	2,368.80	100.00

I've been advised that yes, Council do accept poultry litter, this is categorised as General Solid Waste within the Weighbridge Data Management System and most likely won't be able to determine exact tonnages. However, I'm just waiting on further confirmation and should be able to provide an update before the end of the day.

I hope this information is helpful.

Thank you,
Kind Regards,

Megan Mather |Senior Environmental Officer
W: (02) 6767 5049 M: 0428 469 295
m.mather@tamworth.nsw.gov.au

Tamworth REGIONAL COUNCIL

From: Peter C Scott [mailto:pscott@scolexia.com.au]
Sent: Friday, 15 November 2019 2:35 PM
To: 'Jessica Berry'
Cc: Mather, Megan
Subject: RE: Tamworth Proposal

Commenced my initial review of the various documents and have located some material I required but have requested of Megan some more information which is more detail of the input material, particularly animal based material and disposables like litter associated with livestock.

Ta. Peter C.

From: Jessica Berry <jberry@pittsh.com.au>
Sent: Friday, 15 November 2019 2:22 PM
To: pscott@scolexia.com.au
Cc: 'Megan Mather' <m.mather@tamworth.nsw.gov.au>
Subject: RE: Tamworth Proposal

Hi Peter,

Just wanted to follow up with regards to your proposal for the below?

Kind Regards,

Jess

pitt&sherry

Jessica Berry

Principal Environmental Consultant (CEnvP)

Mobile +61 438 598 793 | jberry@pittsh.com.au | Connect on LinkedIn

pittsh.com.au

From: Jessica Berry
Sent: Monday, 11 November 2019 4:54 PM
To: pscott@scolexia.com.au
Cc: 'Megan Mather' <m.mather@tamworth.nsw.gov.au>
Subject: Tamworth Proposal

Hi Peter,

As discussed this afternoon please forward your proposal regarding biosecurity assessment for the proposed Tamworth Organics Recycling Facility to myself and Megan Mather (m.mather@tamworth.nsw.gov.au) who is CC'd in this email.

Much Appreciated,

Jessica

pitt&sherry

Jessica Berry

Principal Environmental Consultant (CEnvP)

Mobile +61 438 598 793 | jberry@pittsh.com.au | Connect on LinkedIn

Sydney Office — Level 9, North Tower, 1-5 Railway Street, Chatswood NSW 2067
PO Box 5487 West Chatwood NSW 1515 | Phone +61 2 9468 9300

Wagga Wagga Office — Suite 4, 33 Fitzmaurice Street, Wagga Wagga, NSW, 2650
Phone +61 2 9468 9300

pittsh.com.au

Peter C Scott

From: Kate Wingett <kate.wingett@dpi.nsw.gov.au>
Sent: Tuesday, 3 December 2019 2:03 PM
To: Peter C Scott
Cc: Byron Stein; Mather, Megan; Adam Bishop
Subject: Re: Tamworth ORF discussion, biosecurity risks

Hi Peter,

Following the teleconference today, here is the information from the NSW EPA public orders and exemptions for resource recovery. Note, orders apply to the "generators" i.e. the folk doing the composting and exemptions apply to "consumers" i.e. folk land-applying the end -product.
https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/current-orders-and-exemption

Food organic/gardens organics (i.e. waste from green bins) will be covered by the Composting Order and Exemption. There are also public RROs/RREs for liquid and solid food waste, manure, effluent, and processed animal waste. Raw animal by-product would require a specified resource recovery order and exemption - the "generator" would need to apply for this through the NSW EPA.

Happy to discuss.

Kind regards,
Kate

Kate Wingett | Senior Veterinary Policy & Project Officer
NSW Department of Primary Industries | Biosecurity & Food Safety
161 Kite Street | Locked Bag 21 | Orange NSW 2800
T: +61 2 6391 3717 | M: 0438 549 459
E: kate.wingett@dpi.nsw.gov.au
W: www.dpi.nsw.gov.au/biosecurity

On Mon, Dec 2, 2019 at 12:32 PM Adam Bishop <abishop@pittsh.com.au> wrote:

> Please use the following Dial In details:
>
> Phone: 1800 945 187
>
> Guest passcode: 323648

Agenda:

1. All - Introduction / roles

2. P&S / TRC – Objectives for the meeting

3. DPI – Summarise key issues (refer also Byron Stein's 5 November email). What are the 'must have' outstanding matters required to enable DPI to finalise assessment?

4. Peter Scott – Comment on the key issues, approach to addressing issues and expected format of response

5. All – close with agreement on way forward and response/review timeframes

Peter C Scott

From: Kate Wingett <kate.wingett@dpi.nsw.gov.au>
Sent: Tuesday, 3 December 2019 3:58 PM
To: Peter C Scott
Subject: Re: Tamworth ORF discussion, biosecurity risks

Hi Peter,

The Composting Order will be the most relevant document in this situation. I don't have the application accessible to me at the moment- possibly Effluent order and Liquid Food Waste as well.

Kind regards,
Kate

Kate Wingett
Senior Veterinary Policy & Projects Officer
NSW Department of Primary Industries
E: Kate.wingett@dpi.nsw.gov.au
P: (02) 6391 3717
M: 0438 549 459

On 3 Dec 2019, at 3:17 pm, Peter C Scott <pscott@scolexia.com.au> wrote:

> Kate, to assist me for expedience now that I have viewed the web site which are the salient ones I should download.
> Ta. Peter C.
>
> **From:** Kate Wingett <kate.wingett@dpi.nsw.gov.au>
> **Sent:** Tuesday, 3 December 2019 2:03 PM
> **To:** Peter C Scott <pscott@scolexia.com.au>
> **Cc:** Byron Stein <byron.stein@dpi.nsw.gov.au>; Mather, Megan <M.Mather@tamworth.nsw.gov.au>; Adam Bishop <abishop@pittsh.com.au>
> **Subject:** Re: Tamworth ORF discussion, biosecurity risks
>
> Hi Peter,
>
> Following the teleconference today, here is the information from the NSW EPA public orders and exemptions for resource recovery. Note, orders apply to the "generators" i.e. the folk doing the composting and exemptions apply to "consumers" i.e. folk land-applying the end -product.
> https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/current-orders-and-exemption
>
> Food organic/gardens organics (i.e. waste from green bins) will be covered by the Composting Order and Exemption. There are also public RROs/RREs for liquid and solid food waste, manure, effluent, and processed animal waste. Raw animal by-product would require a specified resource recovery order and exemption - the "generator" would need to apply for this through the NSW EPA.
>
> Happy to discuss.
>
> Kind regards,
> Kate

Peter C Scott

From:	Byron Stein <byron.stein@dpi.nsw.gov.au>
Sent:	Wednesday, 4 December 2019 10:02 AM
To:	Dr. Peter Scott
Cc:	Kate Wingett
Subject:	Fwd: Tamworth ORF discussion, biosecurity risks
Attachments:	Food-borne pathogens and animal botulism issues surrounding the on-farm composting of layer chicken waste and mortalities – a review.pdf

Hi Peter,

Further to the email from Kate Wingett below, its important to note the following:

1. While compost is subject to a resource recovery order and exemption it is important to note that this does not include compost made with animal material/carcasses.
2. Compost produced containing material of animal origin requires a specific or individual resource recovery order and exemption (from NSW EPA) if the material will be removed from the site.

The EPA requires a protocol of >55oC for a minimum of three days and repeated 5 times (so a total of 15 days >55oC). The attached document is instructive in terms of the protocol that the EPA uses, which is based on US EPA protocols.

An excerpt on pages 132-133 from the attached is "As previously cited in the USEPA document, PFRP type process controls for composting have the possibility of achieving Class A compost. This requires temperatures of 55oC for 15 days for windrows and 55oC for 3 days for static aerated piles. The windrows require a minimum of 5 turns. This process is recognised by the guidelines to be able to reduce the non-spore forming bacteria like Salmonella"

I hope this helps.

Kind regards

Byron Stein, MSc.Agr| Development Officer, Poultry Meat
Intensive Livestock
NSW Department of Primary Industries | Agriculture
Level 2, 159 Auburn Street | Goulburn| NSW 2580
T: +61 2 4824 3734 | M: 0428 259 628 | E: byron.stein@dpi.nsw.gov.au

---------- Forwarded message ---------
From: **Kate Wingett** <kate.wingett@dpi.nsw.gov.au>
Date: Tue, 3 Dec 2019 at 14:03

Subject: Re: Tamworth ORF discussion, biosecurity risks
To: Peter C Scott <pscott@scolexia.com.au>
Cc: Byron Stein <byron.stein@dpi.nsw.gov.au>, Mather, Megan <M.Mather@tamworth.nsw.gov.au>, Adam Bishop <abishop@pittsh.com.au>

Hi Peter,

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Happy to discuss.

Kind regards,
Kate

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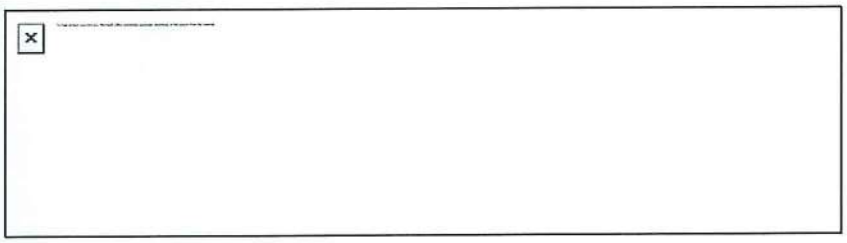

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This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

APPENDIX 4

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postal address: 16 Learmonth Street, Moonee Ponds, Victoria Australia 3039
telephone: +61 (0) 3 9326 0106 facsimile: +61 (0) 3 9372 7576 email: info@scolexia.com.au

Disclaimer: This map has been produced by the GIS and Spatial Services of Tamworth Regional Council using information captured by Tamworth Regional Council and NSW Land and Property Information (October 2019).

Tamworth Regional Council accepts no responsibility both in contract or tort (and particularly in negligence) for any errors omissions or inaccuracies whatsoever contained within or arising from this map.

Cadastre Date: October 2019, Land and Information, NSW
Image Date: February 2015 (Aerometrex)

Tamworth Regional Council

Forest Road Landfill

23 October 2019

0 15 30 60 90 120
Metres

Scale @ A3: 1:3,500

Datum: GDA 94 Projection: MGA Zone 56
Date Printed: 28 October 2019
Created By: TRC GIS

Tamworth Regional Council GIS and Spatial Services