



# ENVIRONMENTAL IMPACT STATEMENT

## Proposed 50,000tpa Enclosed Food and Gardens Organics Composting Facility

Australian Native Landscapes Pty Ltd

Designated Development

12 Pindimar Road, Tea Gardens, NSW

August 2024





# Proposed 50,000tpa Enclosed Food and Garden Organics Composting Facility

12 Pindimar Road TEA GARDENS NSW 2871

## Version Control

Ver. No.	Date	Author	Reviewer	Details
1	05.07.2024	Shaun Smith - <i>Principal Environmental Advisor</i>	Jason Princehorn - <i>Senior Environmental Advisor</i>	Draft report for client review
2	29.07.2024	Shaun Smith - <i>Principal Environmental Advisor</i>	Adeleh Khoshzaban - <i>Environmental Advisor</i>	Final for lodgement to MCC

## Approved for Issue

Name	Signature	Date
Shaun Smith – Principal Environmental Planner		15 August 2024

## Report Prepared for:

Australian Native Landscapes Pty Ltd

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## Report Prepared by:

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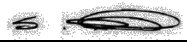
ANL Tea Gardens - EIS





## STATEMENT OF VALIDITY

Submission of Environmental Impact Statement (EIS) prepared under the Environmental Planning and Assessment Act 1979.

EIS Prepared by:	
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Address:	PO Box 234, CARDIFF NSW 2285
<u>In respect of</u>	
<b>Development Application</b>	
Proponent Name:	Australian Native Landscapes Pty Ltd
Proponent Address:	317 Mona Vale Road, TERREY HILLS NSW 2084
<b>Environmental Impact Statement</b>	
	An EIS is attached.
<b>Declaration</b>	
Certificate:	I certify that I have prepared the contents of this EIS and to the best of my knowledge, It is in accordance with Part 8, Division 5 of the <i>Environmental Planning and Assessment Regulation 2021</i> , It contains all available information that is relevant to the Environmental Assessment (EA) of the development to which this statement relates, and It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
Signature:	
Name:	Shaun Smith
Date:	15.8.2024



## EXECUTIVE SUMMARY

### Overview

Wedgetail Project Consulting (Wedgetail) has prepared this Environmental Impact Statement (EIS) on behalf of Australian Native Land Pty Ltd (ANL), to support an application to the Mid-Coast Council (MCC) to receive and compost 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) (The Project) within an existing approved wood waste building at 12 Pindimar Road, Tea Gardens NSW on Lot 1 DP74149.

ANL currently operates the facility in accordance with Development Consents 3264/1988, DA227/2015, and DA-9/2021. More recently, DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the approved wood waste processing building.

ANL seeks approval of a new DA to process up to 50,000tpa of FOGO within the existing approved wood processing building authorised under DA-9/2021. It is proposed to repurpose and retrofit this approved building and operate the FOGO composting operations within this building. The 50,000tpa FOGO operation would form part of the existing EPA licenced volume of 150,000tpa, therefore there will be no increase in the amount of material to be received and processed at the site. Only the types of materials approved to be received at the site will be altered.

The Project will not extend outside of the existing approved disturbance footprint and will be fully contained within Lot 1 DP74149.

The development is deemed to be 'Designated Development' under the Environmental Planning & Assessment Act 1979 (EP&A) and as such Secretary's Environmental Assessment Requirements (SEARs) for the preparation of this EIS are required and were subsequently issued on 11 January 2024.

### Site Description

The project site is located within the MCC Local Government Area, zoned RU2 – Rural Landscape. The development site is legally described as Lot 1 DP74149, 12 Pindimar Road, Tea Gardens, NSW.

The subject site is located on the southern side of Myall Way, adjacent to the Pindimar Road intersection. The site fronts both Myall Way and Pindimar Roads. The subject site has an area of approximately 42.47 hectares (ha) and falls from the northeast to the southwest by some 10 metres (m). The proposed development is permissible within the RU2 land zoning.

The subject site is bordered by land similarly zoned for rural use to the north, south, east, and west. Land use in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. Residential homes are primarily located north, south, and west of the site, with a commercial fish farm to the east.

### Project Description

The Project involves the use of an existing approved building at an existing landscape supply yard, composting and wood chipping operation for the receipt and composting of FOGO to produce organic substrates. Existing approved infrastructure at the site is proposed to be utilised as a part of the proposed development.

The proposed composting activities will utilise the existing approved infrastructure and do not require any changes to the existing approved shed, as the building has been previously designed and approved for composting wood and vegetative waste. The Project seeks to incorporate FOGO as an additional feedstock. The layout of the existing building will remain unchanged, thereby not increasing the existing approved disturbance footprint of the site.



## Project Needs and Alternatives

Due to NSW Government targets, including the *Waste and Sustainable Materials Strategy 2041* (WaSM), all household food and garden organics must be diverted from landfills in all LGAs by 2030. This aims to reduce methane emissions and enhance resource reuse. This has created the need for significant additional waste recycling infrastructure and processing capacity in NSW to meet these initiative targets. The proposed receipt, composting, and reuse of FOGO by ANL will significantly contribute to these initiatives being met. As part of the Project, an existing approved building at an existing landscape supply yard, composting and wood chipping operation would be used for the receipt and composting of FOGO to produce organic substrates. Use of an existing approved building would minimise impacts on the surrounding environment. In addition to the environmental, social, and economic benefits of the proposed development, the facility would service the increasing need and demand for resource recovery infrastructure in regional NSW. This infrastructure would then assist local councils and the NSW Government to meet the target of diverting all organic wastes from landfills by 2030.

Throughout the planning stages of the proposal, the Project considered alternative sites and infrastructure options. An existing landscape supply facility, operational since 1952, was chosen for the composting activities. Minor modifications will be made to manage ventilation without increasing disturbance. Integration into the existing site benefits both the community and local amenities. The chosen Pindimar Road site offers easy access to major transport routes and proximity to waste sources and markets. All other locations considered were either too close to residences, removed from access to major transport routes, or too far from waste sources making transport costs too high and the development uneconomic.

## Planning Approval Pathway

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the statutory framework for environmental assessment and planning approval in NSW. The project is considered 'Designated Development' in accordance with Section 4.10 of Part 4 of the EP&A Act and Schedule 3 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regs). Specifically, Schedule 3, Part 2, Clause 16 of the EPA&A Regs defines designated development for '**Composting facilities**' as:

- (1) *Development for the purposes of a composting facility or works is designated development if the facility or works process more than 5,000 tonnes per year of organics.*
- (2) *Development for the purposes of a composting facility or works is designated development if the facility or works are located—*
  - (a) *in or within 100 metres of—*
    - (i) *a natural waterbody, or*
    - (ii) *a wetland, or*
    - (iii) *a coastal dune field, or*
    - (iv) *an environmentally sensitive area of State significance, or*
  - (b) *in an area of high watertable, highly permeable soils, acid sulfate, sodic or saline soils, or*
  - (c) *in a drinking water catchment, or*
  - (d) *in a catchment of an estuary where the entrance to the sea is intermittently open, or*
  - (e) *on a floodplain, or*
  - (f) *within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the consent authority's opinion, considering topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood because of noise, visual impacts, vermin, traffic or air pollution, including odour, smoke, fumes or dust.*

As the facility will compost up to 50,000tpa of organic material, the development is classified as 'Designated Development'.



The assessing body for the development is the MCC and the determining authority is the Regional Planning Panel (JRPP).

## **Consultation and Stakeholder Engagement**

### ***Government***

Consultation with government agencies was initiated by the Department of Planning, Housing, and Infrastructure (DPHI) during the preparation of the Secretary's Environmental Assessment Requirements (SEARs). Government agencies that provided a response to DPHI for inclusion in the SEARs included:

- Mid Coast Council,
- NSW Environmental Protection Authority (EPA),
- Transport for NSW (TfNSW),
- Water NSW, and
- Fire & Rescue NSW.

Consultation with the above agencies has continued during the preparation of this EIS.

### ***Community***

The purpose of the community consultation program was to identify the key community stakeholders, present the stakeholders with details of the proposed Project, and allow the stakeholders to provide feedback and identify any issues or concerns they may have. The community consultation program focused on those landowners and occupiers who are likely to be impacted by the construction and or the operation of the Project. Community consultation consisted of a mailbox drop of project information and individual discussions by phone.

## **Environmental Impact Assessment**

### ***Traffic and Access***

A **Traffic Impact Assessment** (TIA) for the proposed development has been undertaken by Varga Traffic Planning Pty Ltd on 18 March 2024.

The site is located on the eastern corner of the Myall Way and Pindimar Road intersection. The site is accessed via an existing sealed two-way driveway, with a right turn in and a left turn out from and to Pindimar Road. Where the site access road meets Pindimar Road, a concrete apron is installed which prevents the deterioration of the road pavement from turning heavy vehicles. Sight distances both north and south along Pindimar from the entry point are adequate.

Vehicular access to the parking and loading facilities is provided via an existing entry/exit access driveway located off the northern end of the Pindimar Road site frontage. Pindimar Road meets Myall Way at a T-intersection approximately 82m northeast of the site entrance. Myall Way then provides direct access to the Pacific Highway 2.5km to the northwest.

Onsite, there are 28 car parking spaces currently provided for staff and visitors adjacent to both the site office and the approved baling shed. Truck parking, and an associated turning area, are currently provided immediately north of the approved hay shed. All operational areas of the site are concrete hardstands that provide all-weather access. Concrete also provides a durable surface for the operation of plants and equipment.

The Project aims to compost up to 50,000 tpa of FOGO within an existing approved wood waste processing building. The site is currently approved to process 150,000 tpa of various organic materials. Under the proposal, the intake of FOGO would increase to 50,000 tpa, while the intake of wood waste materials would





decrease to 100,000tpa, maintaining the total intake of organics at 150,000tpa. This adjustment ensures that there is no net increase in the approved annual intake of organics. Consequently, the expected number of truck movements, approximately 45 per day, will remain unchanged.

There will be no change to the existing staff numbers, associated operating hours, or the amount of organics received onsite per year. As such, the Project is not expected to result in any appreciable change in traffic and parking demands currently generated by the site.

Traffic modelling concluded that the proposed development will not have any unacceptable implications in terms of road network capacity, vehicular access, or off-street parking/loading requirements.

### **Noise and Vibration**

A **Noise and Vibration Impact Assessment** (NVIA) has been undertaken for the proposed development by Koikas Acoustics Pty Ltd on 7 March 2024.

The site is located at the junction of Pindimar Road and Myall Way and 4 noise- sensitive properties are residential dwellings located to the east, south, and west of the site. The nearest sensitive receiver located at 196 Myall Way, Tea Gardens is a vacant landholding with no residential dwelling.

The Noise Impact Assessment was prepared in support of the Project to allow and receipt and processing of up to 50,000tpa of FOGO at the existing site at 12 Pindimar Road, Tea Garden. The assessment concluded that the Project will not introduce additional on-site noise sources nor result in any additional vehicle traffic on-site or on-road. It simply relates to adding FOGO feedstock to the existing wood waste material the site currently handles. The overall site tonnage of 150,000tpa will not change, only the allocation will change to 50,000tpa FOGO and 100,000tpa wood waste.

### **Air Quality**

An **Air Quality Impact Assessment** (AQIA) for the proposed development has been undertaken by The Odour Unit (TOU) Pty Ltd on May 2024.

The assessment describes potential sources of air and odour emissions during construction and operation and provides an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines. The AQOIA focuses on identifying and managing air quality and odour impact risks associated with the transition to FOGO at the Tea Gardens Facility.

The proposed FOGO processing operations will be conducted within a controlled building environment, with ventilation air treated via a biofilter system before release. This method aligns with industry best practices and significantly mitigates odour and dust emissions. The biofilter is designed to remove most of the original odour character from the air stream, leaving a non-problematic 'earthy/musty' smell. Overall, the AQOIA demonstrates effective mitigation of air quality and odour impacts, ensuring minimal impact on the surrounding environment and community.

### **Surface Water**

A **Surface and Groundwater Assessment** (SGWA) has been undertaken by Tattersal Landers Pty Ltd on March 2024.

The assessment describes local soils as predominantly clay and silty clay over weathered sandstone, mapped as Hydrologic Soil Group C with no acid sulfate soil potential. The site's topography ranges from 38m AHD at higher points to 15m AHD at the lowest, with modified slopes not exceeding 5%.

Water management includes extensive reuse from onsite storage dams and tanks, with all stormwaters captured and reused internally. Water management strategies emphasise extensive reuse through onsite



storage dams and tanks, with all stormwaters captured and reused internally. Operating under an active management scenario, the development ensures no runoff leaves the site footprint under normal conditions, contributing to improved long-term site discharge conditions. Additionally, the proposal is situated in an area unaffected by local or regional flooding and is designed to have no impact on flooding in the vicinity.

### ***Aboriginal Heritage***

An **Aboriginal Due Diligence and Historic Heritage Assessment** for the Project prepared by OzArk Environment and Heritage on March 2024.

The Aboriginal Due Diligence concluded that no previously recorded Aboriginal sites within the Project area and there are no landforms with archaeological sensitivity, i.e. areas within 200 metres (m) of 'water'. The visual inspection of the project area determined that no Aboriginal objects or areas with the potential to contain subsurface deposits were identified. The undertaking of the due diligence process resulted in the conclusion that no Aboriginal objects or intact archaeological deposits would be harmed by the Project. Therefore, An Aboriginal Heritage Impact Permit (AHIP) application is not necessary.

### ***Historic Heritage***

The Historic Heritage Assessment determined that no historic heritage items were recorded during the site survey and database searches within or adjacent to the Project area. As a result, the Project is not expected to impact any items of historic heritage significance.

### ***Biodiversity***

A **Flora, Fauna, and Habitat Assessment** (Ecological Assessment) has been prepared by Wildthing Environmental Consultants Pty Ltd for the previously approved extension of the ANL Facility (DA-9/2021). As the Project does not require any additional disturbance to the previously approved disturbance footprint, no additional Ecological Assessment has been undertaken.

The site is located within the NSW North Coast Bioregion and Karuah Manning Sub-bioregion. The site is also located within the Newcastle Coastal Ramp NSW Landscape and occurs in the Mid Coast Local Government Area (LGA).

With the exception of the existing footprint of the ANL operations, the surrounding area is undeveloped and covered in native vegetation consisting primarily of open forest. The invasive *Pinus elliotii* (Slash Pine) identified as a priority weed, is common within parts of the study area.

The Ecological Assessment concluded that the project is unlikely to disrupt the life cycle of any identified threatened species, endangered population, or endangered ecological community for the previously approved disturbance footprint such that local extinction would occur.

### ***Bushfire***

A **Bushfire Assessment Report** (BAR) has been prepared for the proposed development by Tattersall Lander Pty Ltd in February 2024.

The site is mapped as Bushfire Prone Land, containing Vegetation Category 1 land in the south and north of the site, and Vegetation Buffer lands through the centre of the site.

The existing operational areas have been cleared, while the areas outside of the current operational zone are heavily vegetated. Surrounding sites consist of a mixture of vegetated lands and cleared lands which are used for rural uses, including dwellings that are located on the rural properties.

The Bushfire Assessment Report determined that the Project has been assessed in accordance with the NSW Rural Fire Service *Planning for Bushfire Protection Guidelines* (2019) and is deemed fully compliant. The Project is anticipated to have no impact on increasing bushfire risk.





### **Visual Amenity**

A **Visual Impact Assessment** (VIA) has been undertaken by Wedgetail Project Consulting. Due to the proposed development having no additional visual impacts than those previously assessed for the wood waste building DA, it is considered that visual impacts are negligible. The Project involves receiving and composting 50,000tpa of FOGO within an existing approved wood waste processing building on site. As such, the Project does not require any additional infrastructure or changes to the existing approved wood waste processing shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. The varied topography and remnant vegetation bordering the site provide for natural visual screening of the Project infrastructure.

A viewpoint analysis has been undertaken for the project and concluded no views of the site infrastructure will be visible from any of the private residences and the major travel routes due to the screening effect of existing topography and remnant vegetation.

### **Waste Management**

A **Waste Management Assessment** has been prepared by Wedgetail Project Consulting which aims to detail and quantify the waste generated by the Project during operations. It also addresses potential environmental impacts related to waste handling, storage, and disposal, aligning with the objectives outlined in the NSW Waste Avoidance and Sustainable Materials Strategy 2041. Since the wood waste building has previously been designed to handle wood and vegetative waste, no external modifications are required to the building. Therefore, there will be no generation of demolition or construction waste. Waste generated from the operation for the Project would be managed in accordance with the established waste hierarchy which underpins the objectives of the Waste Avoidance and Resource Recovery Act 2001 to ensure that the diversion of waste from landfill is maximised.

### **Socio-Economic**

The project involves receiving and composting FOGO to produce organic substrates, utilising the existing infrastructure at the facility to minimise impacts on the surrounding environment.

In addition to the environmental, social, and economic benefits associated with the Project, the facility would service the increasing need and demand for resource recovery infrastructure in regional NSW and assist the NSW Government in achieving an increased diversion of organic waste from landfills through the provision of strategic infrastructure and processing capacity.

### **Fire and Incident Management**

The proposed development has been assessed and designed in accordance with the requirements of the *National Construction Code (Volume 1)* 2019 (BCA), the NSW Fire and Rescue guideline: *Fire Safety in Waste Facilities*, 2020 and relevant Australian Standards and Codes.

The size and volume of stockpiles and their arrangements were estimated based on the storage capacity, as defined in the site layout drawings.

Mitigation of fire risk has been incorporated into the design and layout of the proposed project and will be included in the Environmental Management Plan for the site.

### **Hazard and Risk**

A Preliminary Risk Screening (PRS) under State Environmental Planning Policy No. 33 Hazardous and Offensive Development (SEPP 33) has been undertaken for the development. The SEPP 33 screenings for storage and transportation of dangerous goods indicate that the development is not considered a hazardous or offensive development in accordance with the guidelines. As such a Preliminary Hazard Assessment is not required.



### **Cumulative Impact**

The assessment of cumulative impacts considers the potential for the impacts from the proposed development to combine with impacts from existing and potential future developments in the vicinity of the site. This may lead to more significant impacts being identified compared to the individual development specific assessment. Cumulative impacts of the development with other projects in the vicinity of the site have been considered in technical studies undertaken as part of the EIS, particularly in relation to odour and traffic. The mitigation measures proposed in each of the specialist assessments in **Section 8** have also been designed to ameliorate potential impacts associated with the development in its own right as well as minimising overall cumulative impacts of the development when considered alongside other future developments.

### **Justification and Conclusions**

This Environmental Impact Statement (EIS) has been prepared to support an application to the MidCoast Council (MCC), to process up to 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) within the existing approved wood processing building located at 12 Pindimar Road, Tea Gardens, NSW.

In addressing the requirements of the Secretary's Environmental Assessment Requirements (SEARs), the assessment has demonstrated that the proposed development is consistent with the objectives of the EP&A Act and is therefore justified based on the findings identified by the environmental, social, and economic investigations performed through the production of this document.

This EIS has determined that the Proposal could be operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives, and reasonable community expectations.





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# 1. INTRODUCTION

## 1.1 OVERVIEW

Wedgetail Project Consulting Pty Ltd (Wedgetail) has been commissioned to prepare this Environmental Impact Statement (EIS) by Australian Native Landscapes Pty Ltd (ANL), to support an application to Mid Coast Council (MCC) for the receipt and composting of 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) within an existing approved wood waste building at 12 Pindimar Road, Tea Gardens NSW. FOGO refers to Food Organics and Garden Organics, a kerbside collection service that recycles food and garden waste into compost.

The site is located approximately 5.5 kilometres (km) southeast of the village of Tea Gardens. The subject land is zoned RU2 – Rural Landscape and is bordered by land similarly zoned for rural use to the north, south, east, and west. Land in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. Residential homes are primarily located to the north, south, and west of the site, with a commercial fish farm located to the east.

As the facility proposes to process 50,000tpa of putrescible waste material, the development is deemed to be ‘*Designated Development*’ under Clause 16 (1) of the *Environmental Planning & Assessment Regulation 2021* (EP&A Reg), and as such Secretary’s Environmental Assessment Requirements (SEARs) for the preparation of this EIS are required and were subsequently issued on 11 January 2024.

The location of the site, from a regional context, is shown in **Figure 1**, and the site location from a local context, is shown in **Figure 2**.

## 1.2 BACKGROUND

The site at 12 Pindimar Road, Tea Gardens was purchased by ANL from Boral in 2013. The site has a complex planning history with respect to DAs, Environment Protection Licences, and other works carried out on this site since 1932. ANL currently operates the facility in accordance with Development Consents 3264/1988, DA227/2015, and DA-9/2021. More recently, DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the approved wood waste processing building.

Further detail on the existing development approved at the site under the above consents is outlined below.

### DA3264/1988

The subject DA approved - “Wood Chipping Plant”.

### DA227/2015

The subject DA approved - “Landscape material supplies, packaging shed and maintenance facility, managers residence and associated works”.

### DA-9/2021 (as amended)

The subject DA approved - “Alterations and additions to existing operations, the inclusion of wood waste processing and ancillary works”.

The subject application seeks approval of a new DA to process up to 50,000tpa of FOGO within the existing approved wood processing building authorised under DA-9/2021.

## 1.3 PROPOSAL

ANL are seeking to receive and compost 50,000tpa of FOGO within an existing approved wood waste processing building, with the existing site approved to accept and process 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics. The 50,000tpa FOGO operation would form part of the



existing EPA licenced volume of 150,000tpa, therefore there will be no increase in the amount of material to be received and processed at the site. Only the types of materials approved to be received at the site will be altered.

This application does not require any changes to the existing approved shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. This application only seeks to include 50,000tpa of FOGO as an alternative feed stock.

## 1.4 PROJECT SITE

The subject site is legally described as Lot 1 DP714149 and is located on the southern side of Myall Way, adjacent to the Pindimar Road intersection. The site fronts both Myall Way and Pindimar Roads. The subject site has an area of approximately 42.47 hectares (ha) and falls from the northeast to the southwest by some 10 metres (m). The site is located within the Mid Coast Council Local Government Area (LGA).

The site contains an approved landscape supply operation (and bagging complex), waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, an aerated composting platform, site office, a managers residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

The western boundary of the irregular shaped parcel extends 778m and the southern boundary extends 449 metres. The eastern and northern boundaries of the site are difficult to define as the boundaries are provided in 6 separate sections providing frontage to both Myall Road and Pindimar Road which consists of approximately 1,334m. Access to the subject site is provided from an existing access road and driveway with frontage to Pindimar Road. Pindimar Road meets Myall Road at a T-intersection approximately 82m northeast of the site entrance. Myall Road then provides direct access to the Pacific Highway 2.5km to the northwest.

## 1.5 APPROVAL PATHWAY

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the statutory framework for environmental assessment and planning approval in NSW. The project is considered 'Designated Development' in accordance with Section 4.10 of Part 4 of the EP&A Act and Schedule 3 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). Specifically, Schedule 3, Part 2, Clause 16 of the EP&A Regs defines designated development for '**Composting Facilities**' as:

### 16 Composting facilities or works:

- (1) *Development for the purposes of a composting facility or works is designated development if the facility or works process more than 5,000 tonnes per year of organics.*
- (2) *Development for the purposes of a composting facility or works is designated development if the facility or works are located—*
  - (a) *in or within 100 metres of—*
    - (i) *a natural waterbody, or*
    - (ii) *a wetland, or*
    - (iii) *a coastal dune field, or*
    - (iv) *an environmentally sensitive area of State significance, or*
  - (b) *in an area of high watertable, highly permeable soils, acid sulfate, sodic or saline soils, or*
  - (c) *in a drinking water catchment, or*
  - (d) *in a catchment of an estuary where the entrance to the sea is intermittently open, or*
  - (e) *on a floodplain, or*



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

As the facility will compost up to 50,000tpa of FOGO material, the development is classified as a 'Designated Development'. The assessing body for the development is the MCC and the determining authority is the Joint Regional Planning Panel (JRPP).

## 1.6 THE APPLICANT

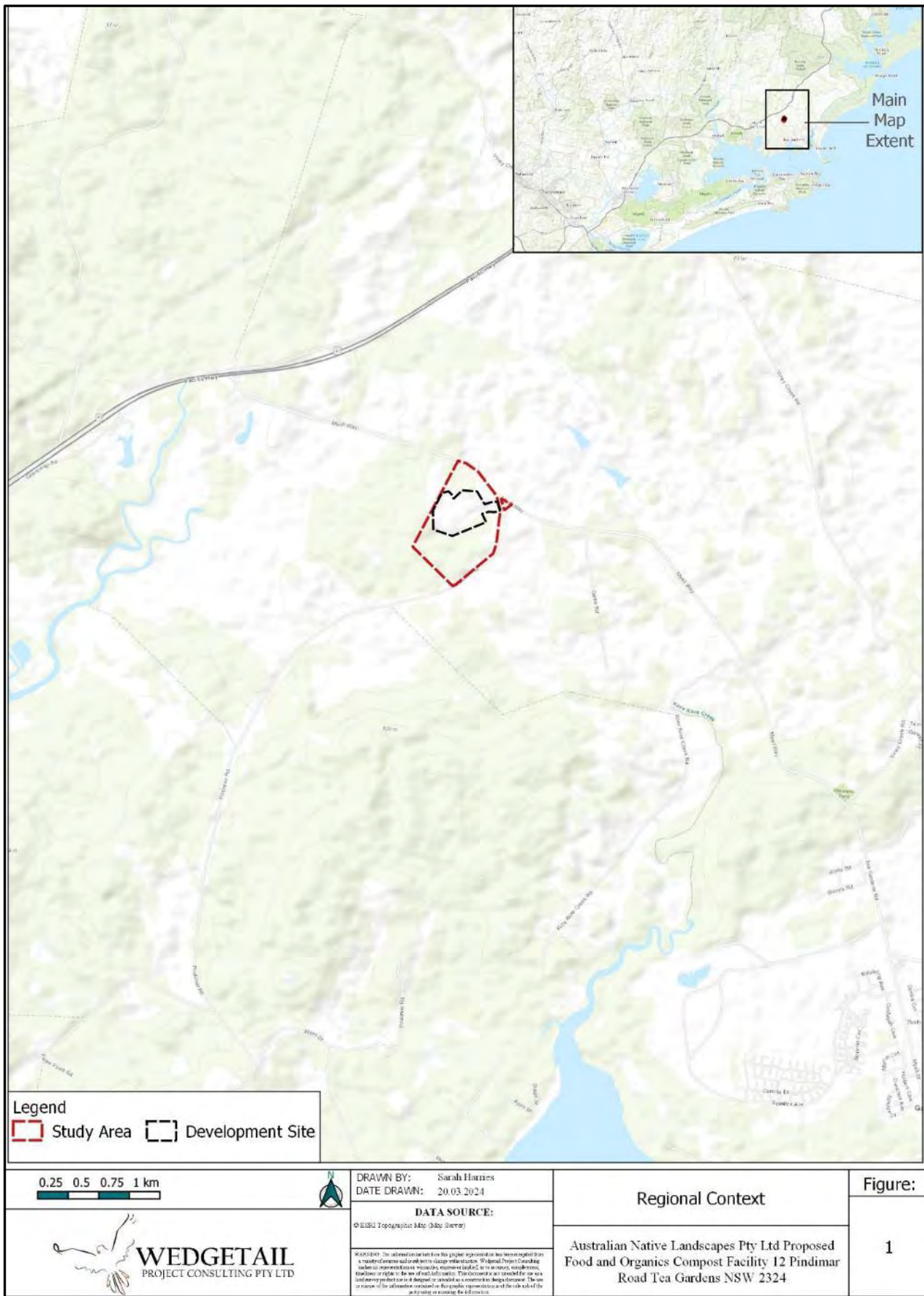
The applicant for this development is Australian Native Landscape Pty Ltd (ANL). ANL launched in March 1971 and has directed its growth to become a truly diverse and environmentally conscious organisation. ANL is an Australian owned and operated family business with Patrick & Sharon Soars and their two sons involved in the daily operations of the business.

ANL is a long-term supplier and producer of horticultural products, organic soils, mulches, composts, and landscape supplies.

The applicant details are summarised below in **Table 1**.

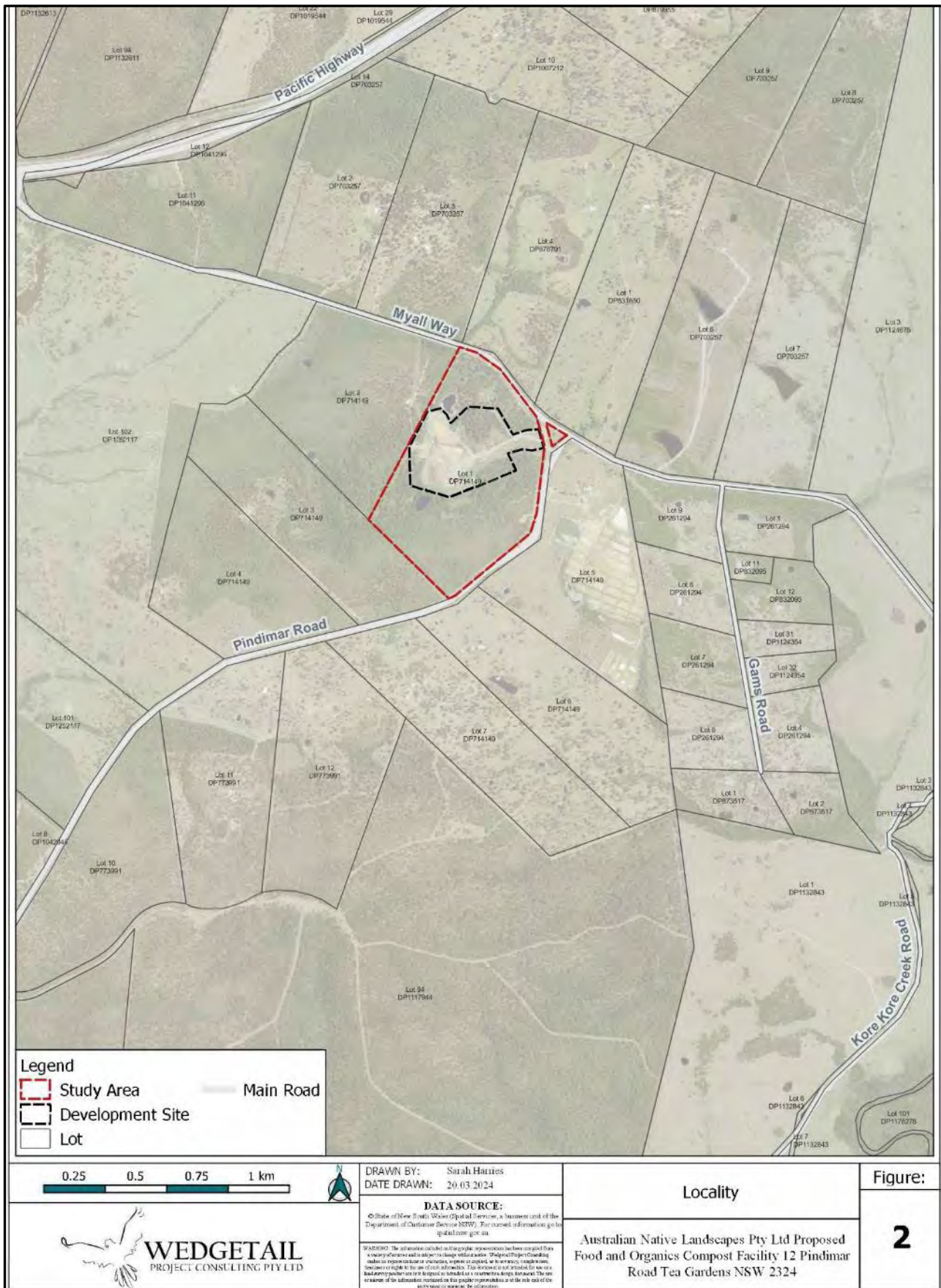
**Table 1: Applicant Details**

Organisation	Australian Native Landscapes Pty Ltd
ABN	ABN: 42 001 749 980
Address	Address: 317 Mona Vale Road, Terrey Hills NSW 2084
Contact	Patrick Soars
Email	patrick@anlscape.com.au
Phone	02 9450 1444



**Figure 1: Site Location - Regional Context**





**Figure 2: Site Location – Local Context**

## 1.7 PURPOSE OF THIS REPORT

The purpose of this EIS is to assess and propose mitigation measures for, the environmental and social impacts of proceeding with the development. This EIS has also been prepared to meet the Secretary's Environmental Assessment Requirements (SEARs) for the proposed facility, issued by the Department of Planning, Housing, and Infrastructure (DPHI) (refer to **Section 1.9**), as well as the recommendations of other consulted agencies and relevant stakeholders. The document has been prepared in accordance with the EP&A Act and the EP&A Regulation.

In addition to describing the Project, the EIS presents a comprehensive and focused assessment of the associated planning and environmental issues to a level of detail commensurate with the scale of the development, the characteristics and previous use of the site, and the legislative framework under which the development is to be assessed and determined. The matters dealt with in the EIS are presented in a manner that clearly addresses the specific requirements of the SEARs, as well as the requirements of other consulted government agencies and stakeholders.

## 1.8 SECRETARY'S ENVIRONMENT ASSESSMENT REQUIREMENTS

A request for the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development was submitted to DPHI on 5 December 2023. SEARs were subsequently issued by DPHI on 11 January 2024.

**Table 2** presents the general requirements and key issues to be addressed in the EIS in accordance with the SEARs and identifies where each requirement is addressed in this EIS. A copy of the formal SEARs for the development is contained within **Appendix A**.

**Table 2: Summary of Secretary's Environmental Assessment Requirements**

Secretary's Environmental Assessment Requirements	Reference within EIS
<b>General Requirements</b>	
The Environmental Impact Statement (EIS) for the development must comply with the requirements and meet the minimum form and content requirements in sections 190 and 192 of the <i>Environmental Planning and Assessment Regulation 2021</i> .	<b>Entire EIS</b>
<b>Key Issues</b>	
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:	
<ul style="list-style-type: none"> <li>• <b>Strategic and Statutory Content</b> – including: <ul style="list-style-type: none"> <li>– a detailed justification for the proposal and suitability of the site for the development,</li> <li>– a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies,</li> <li>– a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out,</li> <li>– a description of how the proposed expansion integrates with existing on-site operations, and</li> <li>– a description of any amendments to and/ or additional licence(s) or approval(s) required to carry out the proposed development.</li> </ul> </li> </ul>	<b>Section 3 Section 5</b>

Secretary's Environmental Assessment Requirements	Reference within EIS
<ul style="list-style-type: none"> <li>• <b>Suitability of the Site</b> – including: <ul style="list-style-type: none"> <li>– a detailed justification that the site can accommodate the proposed processing capacity, having regard to the scope of the operations and its environmental impacts and relevant mitigation measures, and</li> <li>– floor plans depicting the proposed layout, including the location of machinery equipment and stockpiles.</li> </ul> </li> </ul>	<p><b>Section 2</b> <b>Section 3</b> <b>Appendix F</b></p>
<ul style="list-style-type: none"> <li>• <b>Waste Management</b> – including: <ul style="list-style-type: none"> <li>– details of the type, quantity and classification of waste to be received at the site,</li> <li>– details of the resource outputs and any additional processes for residual waste,</li> <li>– details of waste handling including, transport, identification, receipt, stockpiling and quality control, and</li> <li>– the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives, and guidelines in the <i>NSW Waste Avoidance and Sustainable Materials Strategy 2041</i>.</li> </ul> </li> </ul>	<p><b>Section 8.10</b></p>
<ul style="list-style-type: none"> <li>• <b>Hazards and Risk</b> – including: <ul style="list-style-type: none"> <li>– a preliminary risk screening completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 3 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).</li> </ul> </li> </ul>	<p><b>Section 8.13</b></p>
<ul style="list-style-type: none"> <li>• <b>Fire and Incident Management</b> – including: <ul style="list-style-type: none"> <li>– An assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines,</li> <li>– technical information on the environmental protection equipment to be installed on the premises such as air, water, and noise controls, spill cleanup equipment, fire management (including the location of fire hydrants and water flow rates at the hydrants), and containment measures,</li> <li>– details of the size and volume of stockpiles and their arrangements to minimise fire spread and facilitate emergency vehicle access, and</li> <li>– the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives, and guidelines in the NSW Fire and Rescue guideline Fire Safety in Waste Facilities dated 27 February 2020.</li> </ul> </li> </ul>	<p><b>Section 8.12</b></p>
<ul style="list-style-type: none"> <li>• <b>Air Quality</b> – including: <ul style="list-style-type: none"> <li>– a description of all potential sources of air and odour emissions during construction and operation,</li> <li>– an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines, and</li> <li>– a description and appraisal of air quality impact mitigation and monitoring measures.</li> </ul> </li> </ul>	<p><b>Section 8.3</b></p>
<ul style="list-style-type: none"> <li>• <b>Noise and Vibration</b> – including: <ul style="list-style-type: none"> <li>– a description of all potential noise and vibration sources during construction and operation, including road traffic noise,</li> <li>– a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines, and</li> <li>– a description and appraisal of noise and vibration mitigation and monitoring measures.</li> </ul> </li> </ul>	<p><b>Section 8.2</b></p>



Secretary's Environmental Assessment Requirements	Reference within EIS
<ul style="list-style-type: none"> <li>• <b>Soil and Water</b> – including: <ul style="list-style-type: none"> <li>– a description of local soils, topography, drainage, and landscapes,</li> <li>– details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the <i>Water Act 1912</i> and/or the <i>Water Management Act 2000</i>,</li> <li>– an assessment of potential impacts on floodplain and stormwater management and any impact on flooding in the catchment,</li> <li>– details of sediment and erosion controls,</li> <li>– a detailed site water balance,</li> <li>– an assessment of potential impacts on the quality and quantity of surface and groundwater resources,</li> <li>– details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program, and other measures to mitigate surface and groundwater impacts, and</li> <li>– a description and appraisal of impact mitigation and monitoring measures.</li> </ul> </li> </ul>	<b>Section 8.4</b>
<ul style="list-style-type: none"> <li>• <b>Traffic and Transport</b> – including: <ul style="list-style-type: none"> <li>– details of road transport routes and access to the site,</li> <li>– road traffic predictions for the development during construction and operation,</li> <li>– swept path diagrams depicting vehicles entering, exiting, and manoeuvring throughout the site, and</li> <li>– an assessment of impacts on the safety and function of the road network and the details of any road upgrades required for the development.</li> </ul> </li> </ul>	<b>Section 8.1</b>
<ul style="list-style-type: none"> <li>• <b>Biodiversity</b> – including: <ul style="list-style-type: none"> <li>– accurate predictions of any vegetation clearing on site or for any road upgrades,</li> <li>– a detailed assessment of the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, groundwater dependent ecosystems, and any potential for offset requirements in accordance with the current Environment and Heritage Group legislation and guidelines,</li> <li>– details of weed management during construction and operation in accordance with existing State, regional, or local weed management plans or strategies, and</li> <li>– a detailed description of the measures to avoid, minimise, mitigate and/or offset biodiversity impacts.</li> </ul> </li> </ul>	<b>Section 8.7</b>
<ul style="list-style-type: none"> <li>• <b>Community and Stakeholder Engagement</b> – including: <ul style="list-style-type: none"> <li>– a detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted, and the form(s) of the consultation, including a justification for this approach,</li> <li>– a report on the results of the implementation of the strategy including issues raised by the community and surrounding occupiers and landowners that may be impacted by the proposal,</li> <li>– details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal, and</li> <li>– details of the proposed approach to future community and stakeholder engagement based on the results of the consultation.</li> </ul> </li> </ul>	<b>Section 6 Appendix C</b>
<ul style="list-style-type: none"> <li>• <b>Visual</b> – including an impact assessment at private receptors and public vantage points.</li> </ul>	<b>Section 8.9</b>
<ul style="list-style-type: none"> <li>• <b>Heritage</b> – including Aboriginal non-Aboriginal cultural heritage.</li> </ul>	<b>Section 8.5 Section 8.6</b>
<b>Planning Instruments and other policies</b>	



Secretary's Environmental Assessment Requirements	Reference within EIS
<p>The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to:</p> <ul style="list-style-type: none"> <li>State Environmental Planning Policy (Transport and Infrastructure) 2021,</li> <li>State Environmental Planning Policy (Resilience and Hazards) 2021,</li> <li>State Environmental Planning Policy (Biodiversity and Conservation) 2021,</li> <li>Great Lakes Local Environmental Plan 2014, and</li> <li>Relevant Development Control Plans and Section 7.11 plans.</li> </ul>	<b>Section 5</b>
<b>Guidelines</b>	
<p>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 <a href="https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Industries">https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Industries</a>. 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.</p>	<b>Entire Report</b>
<b>Consultation</b>	
<p>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:</p> <ul style="list-style-type: none"> <li>Environment Protection Authority</li> <li>Transport for NSW</li> <li>Fire and Rescue NSW</li> <li>WaterNSW</li> <li>Mid Coast Council</li> <li>the surrounding landowners and occupiers that are likely to be impacted by the proposal</li> </ul> <p>Details of the consultation carried out and issues raised must be included in the EIS.</p>	<b>Section 6</b>

## 1.9 PROJECT TEAM

Wedgetail has prepared the subject EIS on behalf of ANL. Specialist consultants have been engaged to undertake technical assessments for the development and to provide relevant input into the EIS. Details of the project team are provided below in **Table 3**.

**Table 3: Project Team**

Name	Organisation	Role / Specialist Assessment
Shaun Smith	Wedgetail Project Consulting	Project Manager / Document Author
Jason Princehorn	Wedgetail Project Consulting	Report Preparation
Michael Assal	The Odour Unit Pty Ltd	Odour and Dust
Adam Semple	Koikas Acoustics Pty Ltd	Noise and Vibration
Robert Varga	Varga Traffic Planning Pty Ltd	Traffic and Transport
Adrian Varela	Tattersall Lander Pty Ltd	Soil, Water, and Leachate Management
Bob Landers	Tattersall Lander Pty Ltd	Land Survey

Name	Organisation	Role / Specialist Assessment
Daryl Harman Dr Kylie Bridges Mungo Worth	Wild Thing Pty Ltd	Flora and Fauna
Daniel White Callum Balllie	Marline Pty Ltd	Fire and Incident Management
Ben Churcher	OzArk Pty Ltd	Aboriginal and Non-Aboriginal Heritage
Jason Princehorn	Wedgetail Project Consulting	Visual
Jason Princehorn	Wedgetail Project Consulting	Waste Management
Adeleh Khoshzaban	Wedgetail Project Consulting	Socio-economic
Jason Princehorn	Wedgetail Project Consulting	Hazard and Risk

## 1.10 ESTIMATED DEVELOPMENT COST

An Estimate Development Cost (EDC) has been prepared for the subject application which has estimated the value of the works at \$200,000. As the majority of costs for construction, plant, and equipment have been captured under DA-9/2021, the EDC for this application relates primarily to fees for consultants, technical specialists to prepare this EIS, and building alterations. The full EDC is attached as **Appendix B**.



## 2. SITE DESCRIPTION

### 2.1 SITE LOCATION

The subject site is legally described as Lot 1 DP714149 and is located on the southern side of Myall Way, adjacent to the Pindimar Road intersection. The site fronts both Myall Way and Pindimar Roads. The subject site has an area of approximately 42.47 hectares (ha) and falls from the northeast to the southwest by some 10 metres (m).

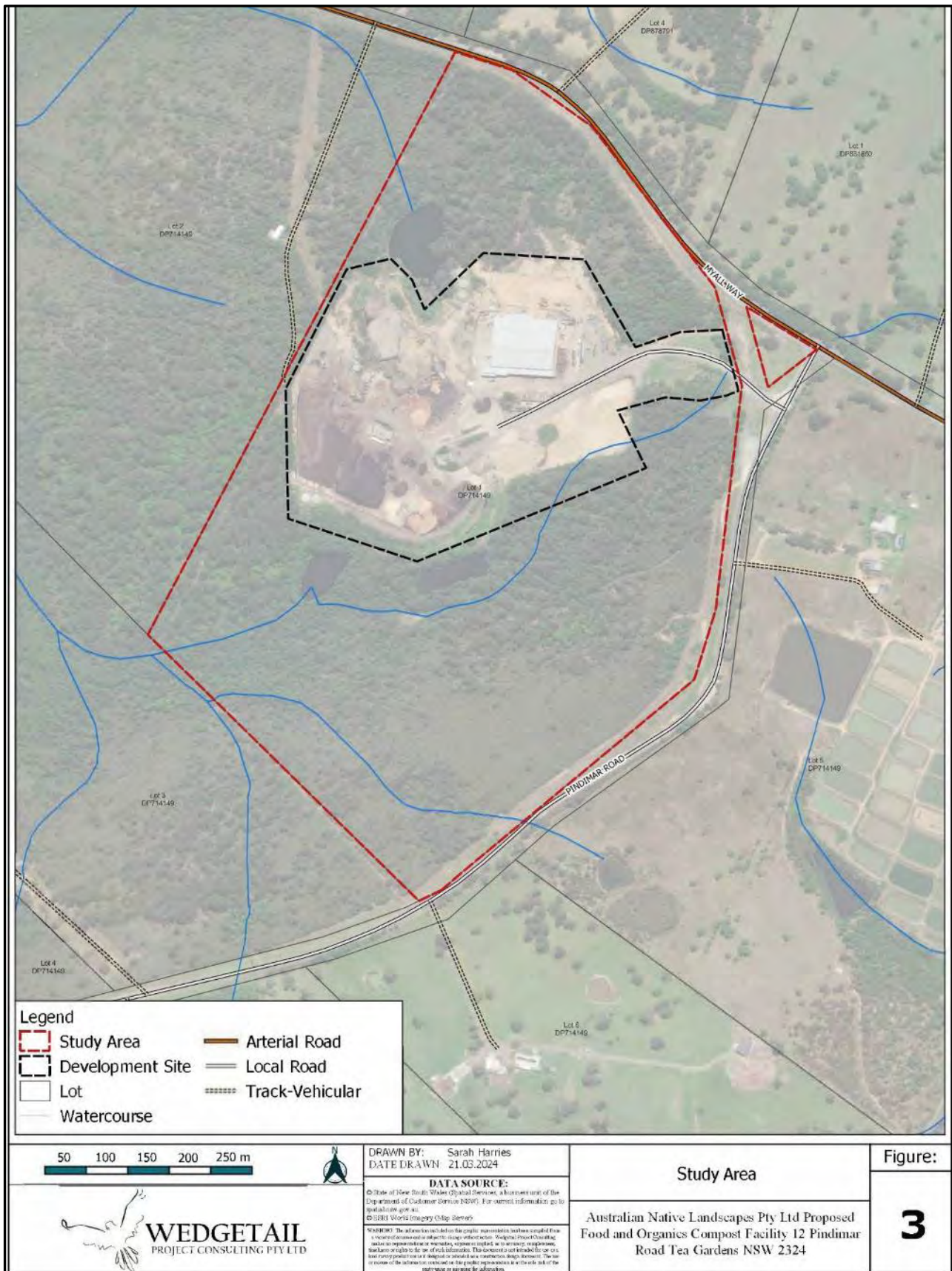
The site contains an approved landscape supply operation (and bagging complex), waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, aerated composting platform, site office, a manager's residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

The western boundary of the irregularly shaped parcel extends 778m and the southern boundary extends 449 metres. The eastern and northern boundaries of the site are difficult to define as the boundaries are provided in 6 separate sections providing frontage to both Myall Road and Pindimar Road which consists of approximately 1,334m. Access to the subject site is provided from an existing access road and driveway with frontage to Pindimar Road. Pindimar Road meets Myall Road at a T-intersection approximately 82m northeast of the site entrance. Myall Road then provides direct access to the Pacific Highway 2.5km to the northwest.

The study area for the project is shown on **Figure 3**.

### 2.2 LAND OWNERSHIP

The site (Lot 1 DP714149) is under the ownership of Australia Native Landscape Pty Ltd. Therefore, ANL is both the landowner and the applicant.



**Figure 3: Study Area**





## 2.3 SITE HISTORY

The following is a chronology of site use over the past 90+ years:

**1932** - Bunderbar Forest Products Limited ("BFP") commenced trading and planted 16,000 acres of *Pinus elliottii*.

**1952** - BFP began processing pine products on the 16,000 acres, including tree harvesting and thinning operations.

**1976** - Australian Pine Products Pty Limited ("APP"), Mr David Williams purchased Bunderbar Holdings.

**1979** - A bush fire destroyed 86% of the forest. To save the timber, APP constructed a chip mill in three (3) months to urgently process the timber.

**1979-1984** - The APP woodchip mill produced 12 ship loads of chip materials for export to Japan. ANL had a contract with APP to remove bark and log yard residue. ANL established holding, stockpiling, composting, and loading facilities and removed approximately 110,000 tonnes of waste in the form of composted bark and timber waste over that period.

**1985** – The site was purchased by Boral (Allan Taylor Limited). Boral processed from 1985 to 1998 and received non-sawlogs waste timber and wood for the manufacture of wood chips.

**1988** - Development application lodged with Council for a Wood Chipping Mill. The application was subject of an Environmental Impact Statement and the DA was referred to the NSW Land and Environment Court for determination by way of an appeal.

**1990 - 1992** - Development Consent No 3264/1988 was granted in (or about) 1990 or 1991 by way of consent orders made by the Land and Environment Court NSW.

**2009** - A modification under S96AA of the EPAA was granted which modified the Consent Orders of 3264/1988. The modification letter describes the development to be a 'wood chipping plant'.

**1985 - 2013** – ANL, along with several other landscape supply organisations, purchased woodchips, chipper fines, waste bark, and timber offcuts for sale as landscape products – estimated volume of approximately 40,000 tonnes per annum.

**2013 - 2014** - ANL purchased the site in September 2013 and began production of woodchip using non-sawlogs and waste timber. ANL has continued to manufacture wood chip in accordance with Development Approval 3264/1988.

**2015** - DA 227/2015 was granted by Council for the additional purpose of "Landscape Material Supplies", including the construction of a packing shed and maintenance facility, manager's residence, and associated works.

**2021** – DA-9/2021 lodged for the construction of two farm buildings, alterations to the existing workshop, installation of stormwater tanks, drainage, and water recycling infrastructure, and construction of a rural building for the processing of wood waste, including non-putrescible vegetative waste from agriculture, silviculture, or horticulture within an enclosed building.

In respect of the Notice of Determination for DA-9/2021, there is reference under Condition 41 – Environmental Protection Agency Requirements which states the following: "The development must be carried out in accordance with the General Terms of Approval (Notice No 1612563, dated 10 February 2022) issued by the Environmental Protection Agency. "The EPA General Terms of Approval, dated 10 February 2022, included the following description of the development proposal:

- *Construction of a rural building for the processing of 40,000 tonnes per annum of category 1 organics including non-putrescible vegetative waste from agricultural, silviculture or horticulture within an enclosed structure;*





- *Construction of two farm buildings for baling and packaging of horticultural products such as sugar cane mulch, lucerne hay mulch, pea straw, pine bark, tea tree mulch and tea tree shavings;*
- *Expansion of leachate dam 1 from 9.2ML to 15.7ML; and*
- *Installation of 80kL underground leachate storage tank.*

In respect of the EPA's General Terms of Approval on page 6, under the heading L3. Potentially Offensive Odour, the following comments make reference to "composting operations":

- *L3. The Applicant must design, install and construct the wood waste processing building to meet or exceed the concept design proposed by The Odour Unit (The Odour Unit, Job No: N2099, Concept Design for an Odour Control System at the Proposed Tea Gardens Wood Waste Processing Building, (12 March 2021)). The wood waste processing building must include:*
  - a) *a full enclosure of the receival, shredding and **composting operations**;*
  - b) *fast-action doors on each truck doorway; and*
  - c) *an air extraction system capable of achieving an air exchange rate of three air changes per hour*
  - d) *and be sufficient to achieve measurable negative pressure conditions.*

It is noted that the approved wood waste processing building meets all of the above relevant criteria and, in particular, the proposal relates to "a full enclosure of the receival, shredding and composting operations".

**2023** – MOD2023/0270 lodged to modify DA-9/2021 for the approved wood waste processing building.

**2024** – MOD2023/0270 Approval - Council, on 21 August 2024, approved a Modification to DA-9/2021. The Modification as approved by Council relates to amendments to the approved shed used for processing of wood and timber waste. The amendments that have been approved include the following:

- Roof area over the approved biofilter;
- New air-con control room;
- New control room;
- New amenities;
- North-westerly extension of the approved building footprint (approximately 7 metres);
- New product receival zone;
- New roller door on the south-eastern elevation; and
- Processed product aero-sorb aerated floor.

In addition, the proposal also includes the placement of solar panels which demonstrates ANL's commitment to sustainability and environmental principles

## 2.4 SITE ZONING

The subject site is zoned RU2 – Rural Landscape under the *Great Lakes Local Environment Plan 2013* (GLLEP). The objectives of the zone are as follows:

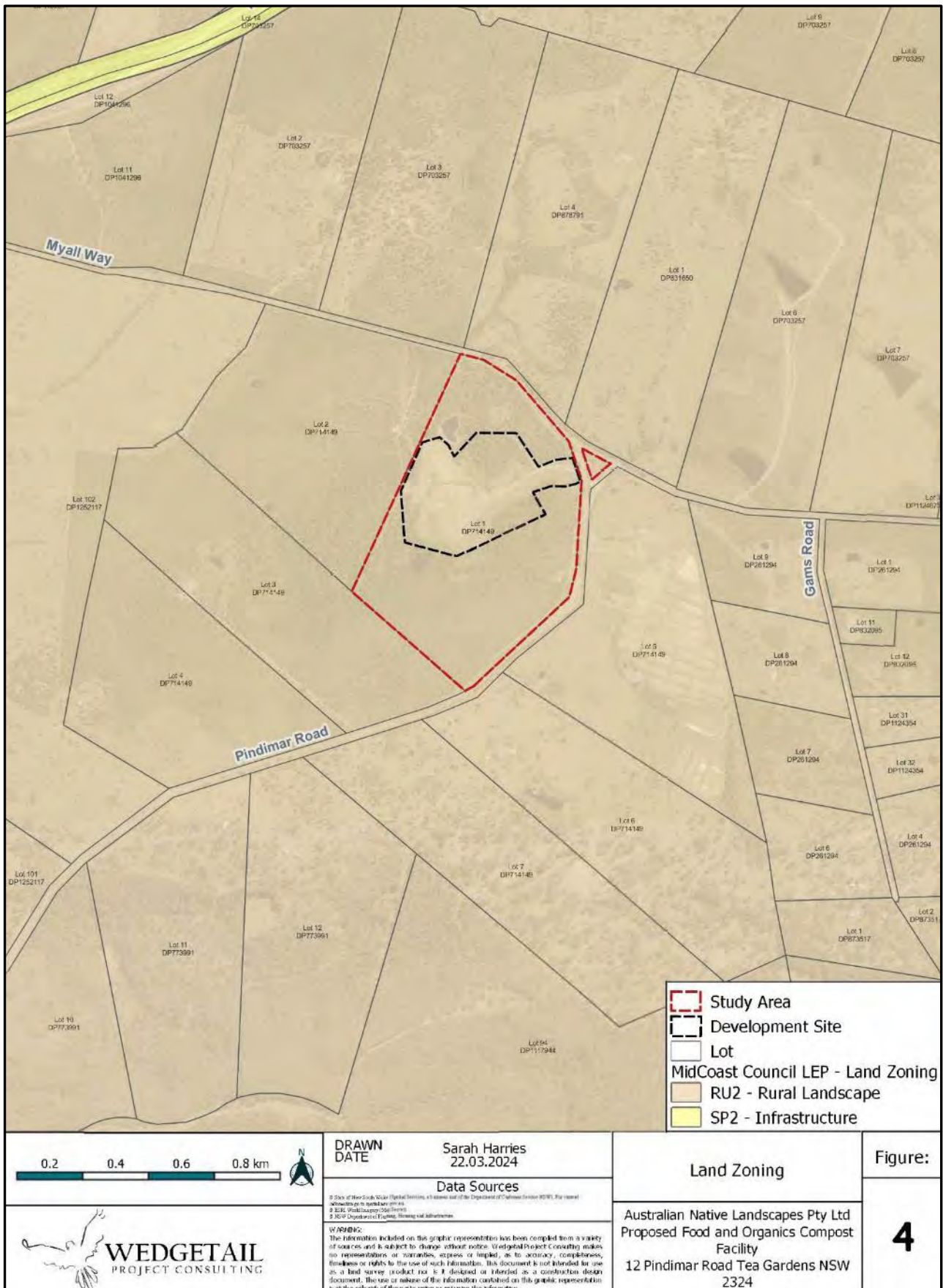
### 1 Objectives of zone

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base*
- *To maintain the rural landscape character of the land*



- *To provide for a range of compatible land uses, including extensive agriculture*
- *To provide for rural tourism in association with the primary industry capability of the land which is based on the rural attributes of the land*
- *To secure a future for agriculture in the area by minimising the fragmentation of rural land and loss of potential agricultural productivity*

A zoning map of the site and its surrounds is provided below as **Figure 4**.



**Figure 4: Land Zoning RU2 – Rural Landscape**

## 2.5 SURROUNDING LANDUSES

The subject land is bordered by land similarly zoned for rural use to the north, south, east, and west. Land in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. Residential homes are primarily located to the north, south, and west of the site, with a commercial fish farm located to the east.

The coastal village of Tea Gardens is located approximately 5.5km southeast of the subject property. Tea Gardens has a population of 3,288 people as per the 2021 census data and is typically a tourist area. Aged care is the main industry of employment for the town's residents, followed by supermarket and grocery retail, cafes and restaurants, real estate, and other social assistance services.

Further to the southeast, approximately 9km, is the village of Hawks Nest which is part of the larger seaside community in the area. Hawks Nest has a population of 1,413 people as per the 2021 census data and is also a popular tourist destination. Similar to Tea Gardens, Aged Care is the largest employer, followed by accommodation, supermarket and grocery retail, hospitality (clubs), and cafes and restaurants.

The closest largest town providing significant employment and services is Raymond Terrace, approximately 37km to the southwest. Raymond Terrace has a population of 14,588 people as per the 2021 census data and has seen significant growth over the past 10 years as people look for more affordable housing outside of Newcastle. Social assistance services, aged care, and supermarket and grocery retail are the largest employers, followed by takeaway food services and road freight transport. Many people living in Raymond Terrace would also commute to Newcastle and the Hunter Valley for employment.

Given the existing zoning around the site, there is limited potential for further land subdivision and residential development in the area. The proposed development is considered to be consistent with existing activities on the site and the rural character of the surrounding area.

The location of the nearest receivers is shown in **Figure 5**.

## 2.6 TOPOGRAPHY

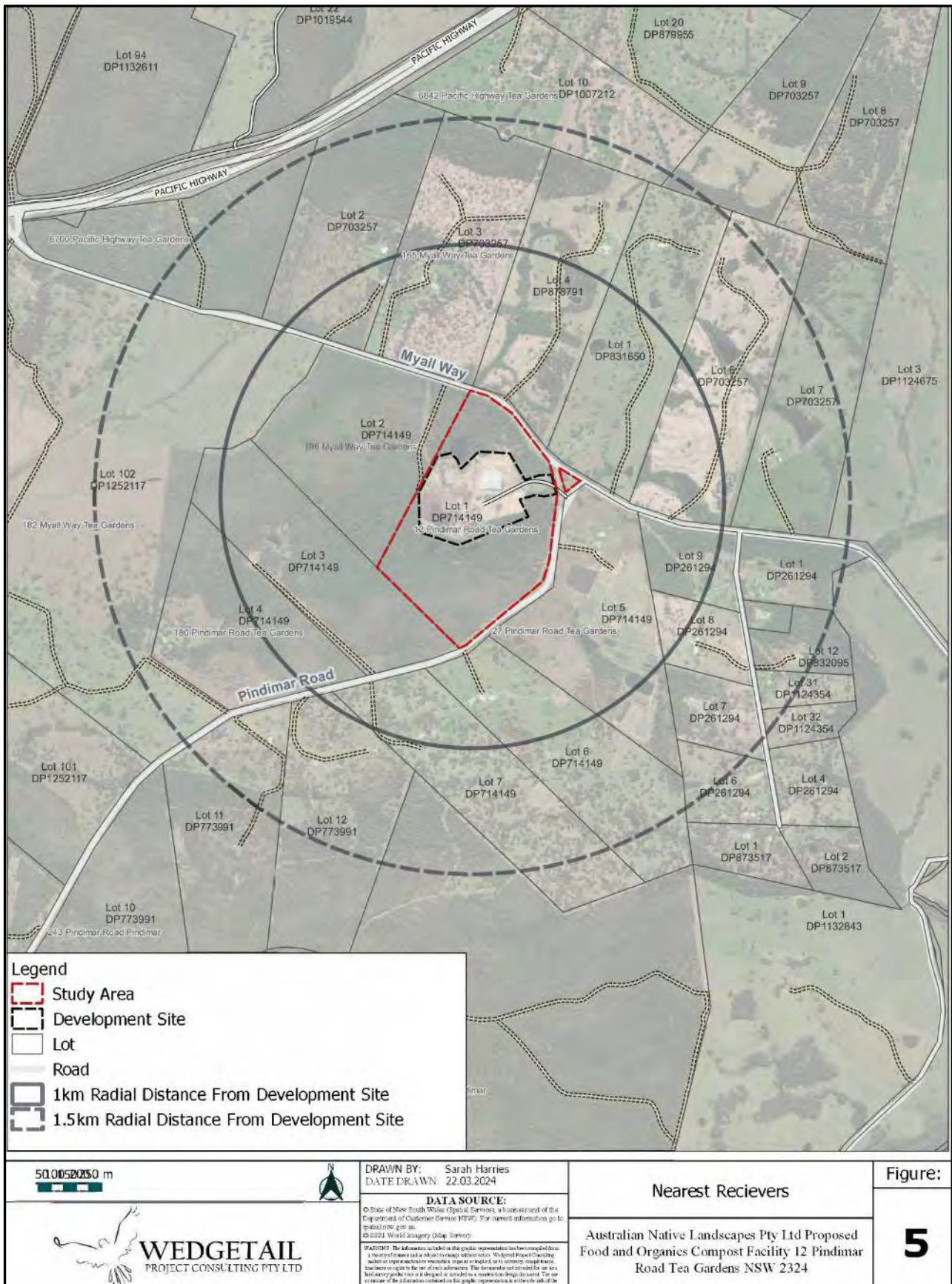
Elevations within the subject land range from approximately 30m Australian Height Datum (AHD) in the northeast to 20m AHD at the lowest point in the southwest, based on 10m contours. A topography and drainage plan are provided below as **Figure 6**.

## 2.7 GEOLOGY AND SOILS

The Soil Landscapes of the Port Stephens 1:100 000 Sheet (Murphy, 1993) indicates that two soil landscapes the Pindimar Road (pr) and the Nungra (ng) were present within the study area. The erosional landscape of Pindimar Road covered the northern two-thirds of the study area including the entire area of impact. The Pindimar Road Soil Landscape is characterised by undulating rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wootton Beds. The soils are moderately deep (30-70cm) well drained Brown Podzolic Soils. The Transferral Nungra Soil Landscape is located on gently inclined Foothills and drainage plains of the Coweabah Hills. They consist of Quaternary alluvium and deep silty footslope deposits eroded from surrounding hills and underlying Carboniferous rock strata. Soils consist of poorly drained soliths.

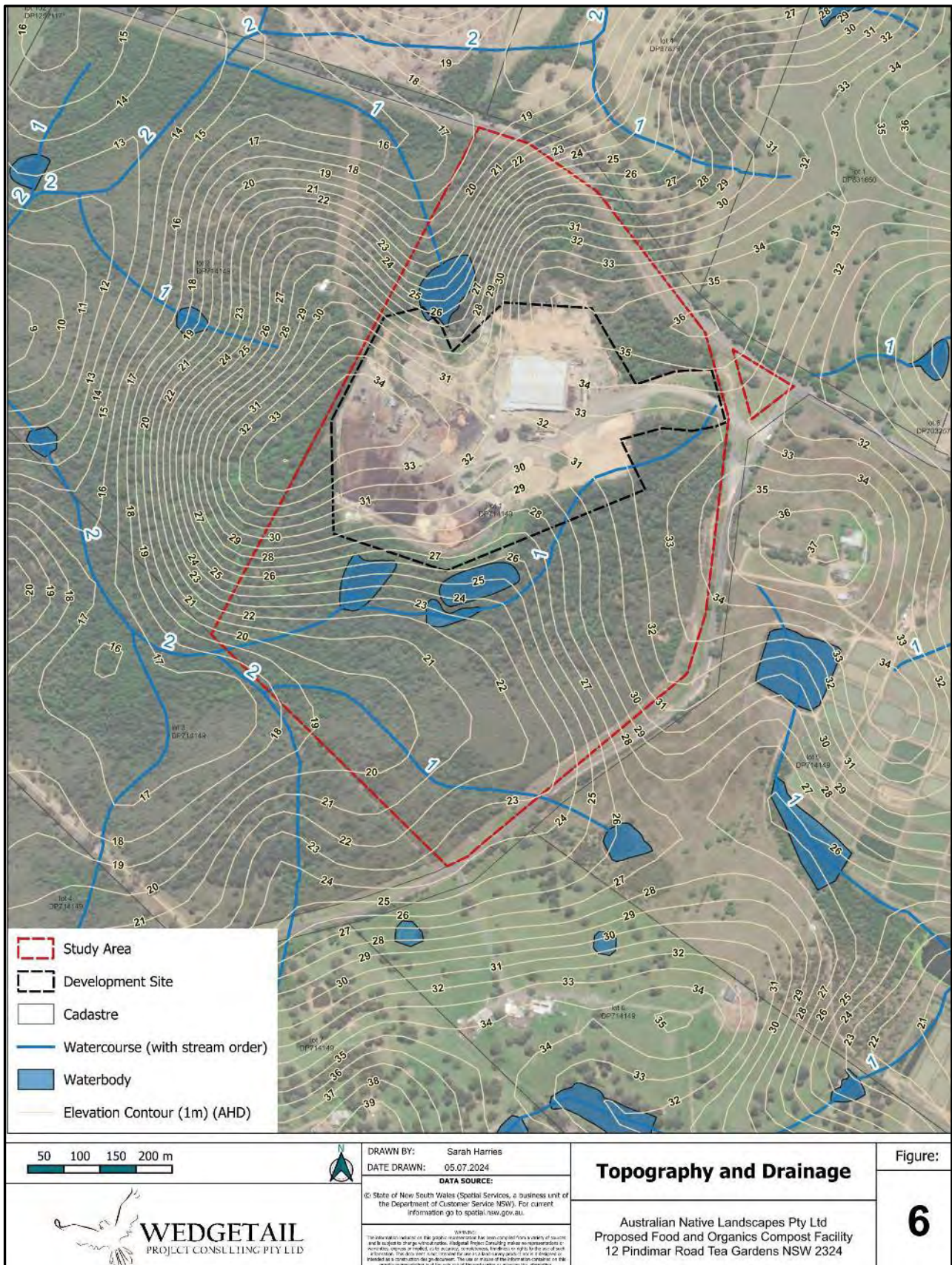
The site is not mapped as having any acid sulfate soil potential.





**Figure 5: Nearest Receivers**





**Figure 6: Topography and Drainage**

## 2.8 HYDROLOGY

Three first order prescribed streams and four dams are present within the site. A first order stream is located within the northwest of the site, with another first order stream running to the southwest through the site. A third first order stream is located within the southeast corner of the site. The existing dams onsite form part of the current site water management system.

### 2.8.1 Surface Water

Surface water across the site is currently managed via an existing integrated water management system. The system allows for the capture, storage, treatment, and reuse of all surface water collected from the operational areas.

The site currently operates under an active management scenario whereby no runoff is permitted to leave the development footprint under normal operating conditions. Roof water is captured and stored onsite for reuse. Surface stormwater runoff is directed along impermeable concrete surfaces to concrete silt traps before the stormwater is discharged to existing storage dams and tanks and recycled onsite. Excluding the dams and silt traps, no exposed ponding of stormwater occurs within the area of the operations. The proposed development will continue to operate under such a scenario. Further discussion on surface water is provided in **Section 8.4**.

### 2.8.2 Groundwater

A search of the Bureau of Meteorology (BoM) Groundwater Explorer indicates that the closest groundwater bore to the site is 3.6km to the northeast. A further search of the database was undertaken which shows there are 17 groundwater bores within a 5km radius of the site, with the majority located to the northeast and south. The bores in the northeast were generally drilled to a depth between 15-16m, with the bores in the south drilled to a depth between 2-4m. Following a review of the bore depths and the related surface contours, data indicates that groundwater below the site would be at a depth of approximately 25-35m. As the site drainage system is fully contained, hard surfaces are fully concreted, and all leachate is captured, it is unlikely that groundwater resources would be impacted by the existing or proposed operations.

## 2.9 BIODIVERSITY

A flora, fauna, and habitat survey were previously undertaken for DA-9/2021 in 2020.

The studies found the following Plant Community Types (PCT) present within the site:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast
- Highly Disturbed Vegetation
- Aquatic Dam Vegetation

An area of Swamp Forest within the subject site was found to be consistent with the Endangered Ecological Community EEC; Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin, and South-East Corner Bioregions, however under the previous proposal and this proposal this TEC is not impacted.



One threatened flora species, *Callistemon linearifolius* (Netted Bottlebrush) was recorded during the 2020 study, with 7 specimens located adjacent to the drainage line to the south-east of the current development. *C. linearifolius* will not be directly impacted by this proposal or the previous proposal.

The 2020 study also concluded that of the 16 flora species assessed, the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetralochea juncea* (Black-eyed Susan).

A total of nine threatened fauna species were recorded within the site as a result of fieldwork:

- *Glossopsitta pusilla* (Little Lorikeet)
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo)
- *Haliaeetus leucogaster* (White-bellied Sea Eagle)
- *Petaurus norfolcensis* (Squirrel Glider)
- *Micronomus norfolkensis* (Eastern Freetail-bat)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Eastern Freetail Bat)
- *Myotis macropus* (Large-footed Myotis)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

The 2020 study also undertook investigations in accordance with the *State Environmental Planning Policy (Koala Habitat Protection) 2019* which revealed that although the site does not contain any evidence of recent koala activity, the site does contain a total of 13 Schedule 2 Koala Food Tree species which totalled greater than 15% with each PCT impacted by the development. Additionally, there have been a total of six records of koalas within 2.5km of the site over the past 18 years (DPIE, 2020). Further discussion on biodiversity is provided in **Section 8.7**.

## 2.10 ABORIGINAL HERITAGE

A search was undertaken of the Aboriginal Heritage Information Management System (AHIMS) on 23.10.2023 with a 1km buffer around Lot 1 DP714149. The results show there are no Aboriginal sites in or near the site, nor are there any Aboriginal places declared in or near the site. The proposed development is not seeking to increase the existing approved disturbance footprint of the site and will be utilising an existing approved shed for composting activities. Further discussion on Aboriginal heritage is provided in **Section 8.5**.

## 2.11 HISTORIC HERITAGE

A search was undertaken of the State Heritage Inventory on 23.10.2023 in relation to Lot 1 DP714149. The results show the closest registered historic heritage site is Durness Homestead located over 5.5km east-southeast of the site. Further discussion on historic heritage is provided in **Section 8.6**.

## 2.12 AIR QUALITY

The site is located in a non-urban area which is completely screened from public roads by trees and boundary landscaping. As a result, the air quality in the area is expected to be high.

Some possible sources of dust are:

- Loading and unloading of materials,
- Truck movements, and



- Dust generated during windy weather.

Existing odour producing sources at the site are likely generated from the approved green waste operation.

Further discussion on air quality is provided in **Section 8.3**.

## 2.13 NOISE

The nearest noise sensitive properties are located mainly to the north, south, and west of the site, being:

- 196 Myall Way, Tea Gardens
- 124 Pindimar Road, Tea Gardens
- 87 Pindimar Road, Tea Gardens
- 27 Pindimar Road, Tea Gardens

It should be noted that 196 Myall Way is a vacant landholding with no residential dwelling.

Further discussion on noise is provided in **Section 8.2**.

## 2.14 TRAFFIC AND ACCESS

The site is accessed via an existing sealed two-way driveway, with a right turn in and a left turn out from and to Pindimar Road. Where the site access road meets Pindimar Road a concrete apron is installed which prevents the deterioration of the road pavement from turning heavy vehicles. Sight distances both north and south along Pindimar from the entry point are adequate.

Onsite, there are 28 car parking spaces currently provided for staff and visitors adjacent to both the site office and the approved baling shed. Truck parking, and an associated turning area, are currently provided immediately north of the approved hay shed. All operational areas of the site are concrete hardstands which provide all weather access. Concrete also provides a durable surface for the operation of plants and equipment.

Currently, the site is approved to process up to 150,000tpa of materials which equates to approximately 45 truck movements per day.

Further detail on traffic is provided in **Section 8.1**.

## 2.15 BUSHFIRE

The NSW Planning Spatial Viewer shows that the site is mapped as Bushfire Prone Land, containing Vegetation Category 1 land in the south and north of the site, and Vegetation Buffer lands through the centre of the site. A Bushfire Assessment Report (BAR) has been prepared and discussed further in **Section 8.8**.

### 3. STRATEGIC CONTEXT

#### 3.1 PROJECT OBJECTIVES

The development and operation of the proposed FOGO composting facility is based on the following identified objectives:

- Reuse of food and garden organics that would otherwise go to landfill,
- Production and beneficial reuse of organic materials as part of the circular economy,
- Value adding to the existing landscape supply operations at the development site,
- Provision of a locally based operation that is purpose built to accept and reuse household food and garden waste,
- Provision of state resource recovery infrastructure and processing capacity, and
- Assisting the local Council and NSW government to meet their waste recycling commitments and initiatives.

#### 3.2 STRATEGIC JUSTIFICATION

The development site is located on land zoned RU2 - Rural Landscape under the Great Lakes Local Environmental Plan 2014 (LEP). The LEP neither permits nor prohibits the establishment of a composting operation within the RU2 zone. However, the proposed composting activities are permissible within this land use zone under the provisions of Chapter 2, Division 23 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP). Clause 2.153 of Division 23 of the SEPP permits the development of 'waste or resource management facilities' within a 'prescribed zone'. The RU2 zone is defined as a 'prescribed zone' under the SEPP and composting activities are defined as an activity undertaken by 'waste or resource management facilities'.

The Project site is located strategically within the lower mid-north coast region and within close distance of Newcastle, Land Macquarie, the Hunter, and Sydney.

The proposal involves the use of an existing approved building at an existing landscape supply yard and wood chipping operation for the receipt and composting of FOGO to produce organic substrates. Existing approved infrastructure at the site is proposed to be utilised as a part of the proposed development. This represents the efficient use of existing site infrastructure to minimise impacts on the surrounding environment.

In addition to the environmental, social, and economic benefits of the proposed development, the facility would service the increasing need and demand for resource recovery infrastructure in regional NSW. This infrastructure would then assist local councils and the NSW Government to meet the target of diverting all organic wastes from landfills by 2030.

It is expected that the net benefits of the Project would far outweigh any residual environmental and/or social impacts. The Project would:

- Contribute towards the supply of organic materials to areas within 200km of the site,
- Provide local employment opportunities,
- Contribute to the continued economic growth at a local and regional level, and
- Provide additional resource recovery capacity, while avoiding, minimising and/or mitigating environmental and social impacts to the greatest extent practicable.





A range of comprehensive assessments are proposed to provide a thorough technical investigation of potential impacts. The assessments will include recommendations to avoid, minimise, and mitigate impacts during operations to ensure the Project would not have unacceptable impacts on the local community and the natural environment. The proposal is considered unlikely to generate significant cumulative impacts, as there are currently no known developments of scale in the locality of the proposal.

### **3.3 NEED FOR THE PROJECT**

Due to NSW Government waste targets and initiatives, including the *Waste and Sustainable Materials Strategy 2041* (WaSM), there is a push to have all household food and garden organic (FOGO) diverted from landfill in all LGAs by 2030. These initiatives are designed to reduce organic waste in landfills, where it generates methane, a potent greenhouse gas, and instead creates a clean stream of a valuable resource that can be beneficially reused. This has created the need for significant additional waste recycling infrastructure and processing capacity in NSW to meet these initiative targets. The proposed receipt, composting, and reuse of FOGO by ANL will significantly contribute to these initiatives being met.

### **3.4 PROJECT ALTERNATIVES**

#### **3.4.1 Do Nothing**

The proposal involves the use of an existing approved building at an existing landscape supply yard and wood chipping operation for the receipt and composting of FOGO to produce organic substrates. Existing approved infrastructure at the site is proposed to be utilised as a part of the proposed development. This represents the efficient use of existing site infrastructure to minimise impacts on the surrounding environment.

In addition to the environmental, social, and economic benefits of the proposed development, the facility would service the increasing need and demand for resource recovery infrastructure in regional NSW. This infrastructure would then assist local councils and the NSW Government to meet the target of diverting all organic wastes from landfills by 2030.

Based on the above arguments, the overall balance of environmental, social, and economic impacts of the development is considered to be positive, and the 'do nothing' option was not considered further.

#### **3.4.2 Alternatives**

The site of the proposed composting operations is an existing landscape supply and wood chipping facility that has been operating in one form or another since 1932. The proposed composting activities will utilise existing approved infrastructure at the site with some minor additions internally and externally to the approved building to manage ventilation, airflow, and shed temperature. This design approach results in no increase in the disturbance footprint of the existing approved operations and no visual change to the site. The integration of the composting activities into an existing approved operating site provides the most favourable outcome to both the community and local amenities.

The Pindimar Road site is also strategically located close to major transport routes, including the Pacific Highway, which provides access for larger vehicles to and from the development via Transport for NSW (TfNSW) approved routes for heavy vehicles.

The site is also ideally located due to its distance from heavily populated residential areas, shopping precincts, schools, and public services, but also being close enough to the areas where organic materials will be sourced, and where end products will be sold.

All other locations considered were either too close to residences, removed from access to major transport routes, or too far from waste sources making transport costs too high and the development uneconomic.



## 4. PROJECT DESCRIPTION

### 4.1 OVERVIEW

ANL are seeking to receive and compost 50,000tpa of FOGO within an existing approved wood waste processing building. FOGO refers to Food Organics and Garden Organics, a kerbside collection service that recycles food and garden waste into compost.

The site is currently approved to accept and process up to 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics. The 50,000tpa FOGO operation would form part of the existing EPA licenced volume of 150,000tpa, therefore there will be no increase in the amount of material to be received and processed at the site. Only the types of materials approved to be received at the site will be altered.

This application does not require any changes to the existing approved shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. This application only seeks to include 50,000tpa of FOGO as an alternative feed stock. Garden organics are currently sourced from the Hawkes Nest and Tea Gardens areas.

An overview of the existing operations is detailed below in **Section 4.2** to provide context.

### 4.2 EXISTING APPROVED DEVELOPMENT

The site has been operating since 1932, in one form or another, for the processing of timber products, wood chipping, composting of wood residues and non-putrescible organics, mixing and blending of organic soils and products, landscape material bagging, and bulk landscape material sales and distribution. The site operates under several DAs, which are detailed further below:

#### **DA3264/1988**

The subject DA approved - *“Wood Chipping Plant”*.

Generally, the following items were approved:

- Plant and machinery for wood chip milling,
- Mobile equipment including trucks and loaders,
- Conveyors, screens, chippers, and log washer,
- Onsite water storage, process water dam, and pumping equipment,
- Weighbridge, and
- Stockpiling and dispatch.

#### **DA227/2015**

The subject DA approved - *“Landscape material supplies, packaging shed and maintenance facility, managers residence and associated works”*.

Specifically, the following items were approved:

- 13 x landscape material storage bins – 6m wide x 8m deep,
- 1 x landscape materials packing shed - 75m x 40m (3,000m<sup>2</sup>),
- 1 x maintenance shed - 75m x 20m (1,500m<sup>2</sup>),



- Provision of 2 x hoppers within the packaging shed leading into packing lines, pallet racking, and truck entry and exit via 6m wide roller shutters,
- Erection of a ground floor office area as part of the packaging shed with kitchen, lunchroom facilities, and toilets,
- Construction of an onsite manager residence above the office area,
- Site cut and fill to a depth of approximately 1m, and
- Supply of landscape materials including storage and sale of soil, gravel, potting mix, mulch, sand, sleepers, screenings, and rock.

#### **DA-9/2021 (as amended)**

The subject DA approved - *“Alterations and additions to existing operations, the inclusion of wood waste processing and ancillary works”*.

Specifically, the following items were approved:

- Construction of two rural buildings for the purpose of baling and packaging horticultural products in conjunction with the existing packaging facility,
- Alterations and additions to the existing workshop, which is located immediately north-east of the existing approved packing shed and workshop,
- Construction of additional bins for storage of landscape material supplies/bulk materials,
- Site works covering total site management, re-use, and storage of water within the site including firefighting infrastructure (additional firefighting water tanks),
- Construction of a rural building for the processing of wood waste within an enclosed structure as an integral component of the approved wood chip mill approved under DA 3264/1988. The following materials are approved to be processed within the wood waste building:
  - **Forestry and sawmill residues** – including untreated and uncontaminated plant materials from forestry operations and sawmills such as bark, wood chip, sawdust, and wood fibre,
  - **Urban wood residues** – including untreated, unpainted, and uncontaminated urban derived timber and wood material such as off-cuts, saw dust, wood shavings, and pallets,
  - **Non-putrescible organics** – including timber, garden trimmings, agricultural organics, forestry and crop materials, and natural fibrous organic and vegetative materials,
- Construction of additional bins for storage of landscape material supplies/bulk materials, and
- Site water management, reuse, and recycling system and firefighting infrastructure.

The existing approved site and operations are shown in **Figure 7**.



**Figure 7: Existing Approved Site and Operations**

### 4.3 PROPOSED DEVELOPMENT

The proposed development seeks to receive and compost up to 50,000tpa of FOGO within an existing approved building. It is proposed to utilise the approved Wood Waste Processing building which is authorised by DA-9/2021 (as amended). The existing site is currently approved to receive up to 150,000tpa of wood waste materials, which includes the following sources:

- Forestry and sawmill residues,
- Urban wood residues, and
- Non-putrescible organics.

The above materials are classified as General Solid Waste (non-putrescible), or Category 1 wastes, as per the NSW EPA Waste Classification Guidelines (2014).

It is proposed to receive 50,000tpa of FOGO while reducing the amount of Category 1 to 100,000tpa to keep the total received tonnages of organics at 150,000tpa. Therefore, there will be no increase in the amount of organics received onsite per year. Food Organics (FO) is classified as General Solid Waste (putrescible), or Category 2 wastes, which by volume will form less than 5% of the total FOGO volume to be received.

As the wood waste building has previously been designed to accept and process wood and vegetative waste (wood waste as described in **Section 3.2**), the building will not require any modifications. The existing approved building has been designed to manage leachate, noise, and odour.

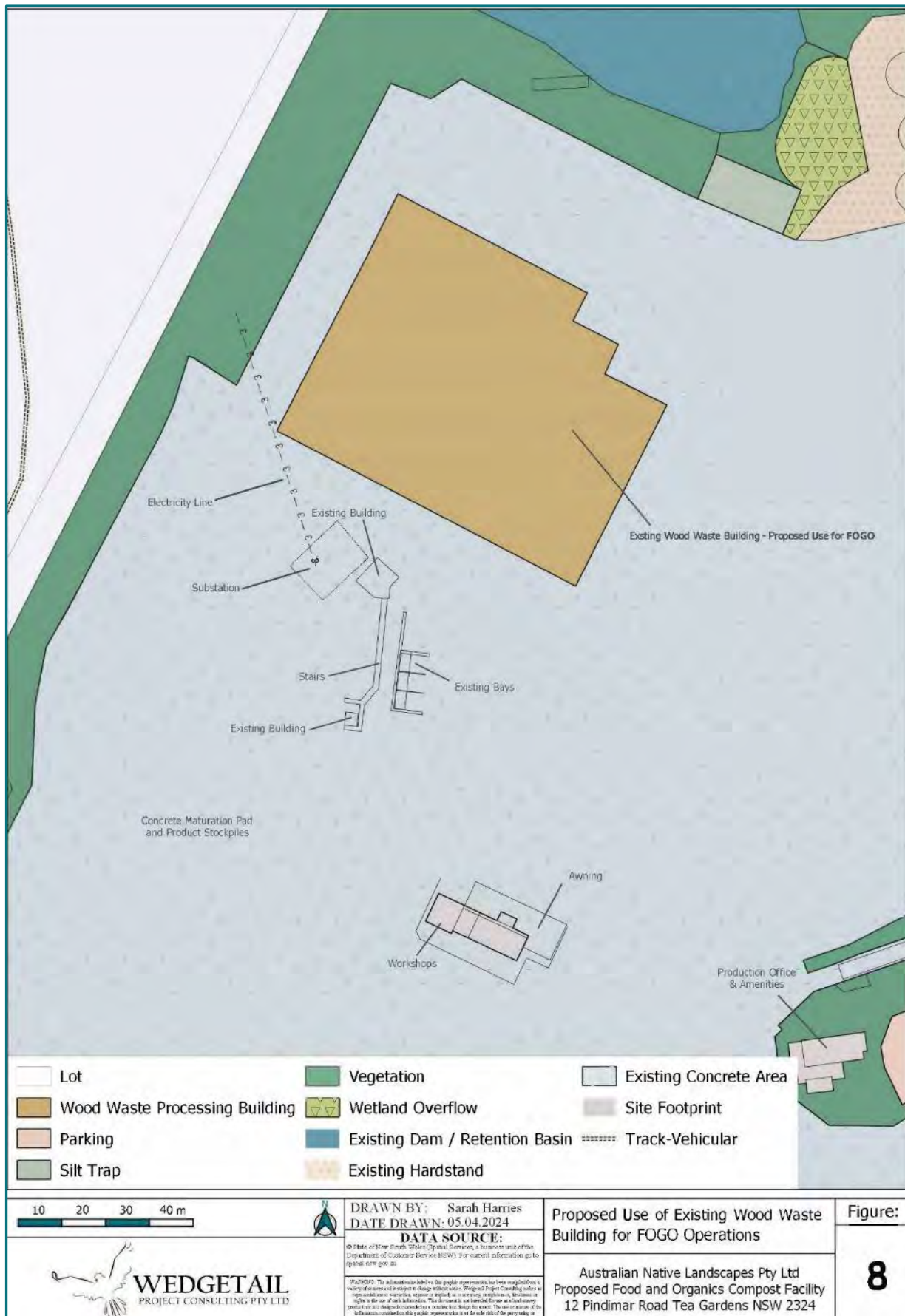
#### 4.3.1 Composting Building

This application does not require any changes to the existing approved shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. This application only seeks to add FOGO as an additional feed stock.

This is a rural building measuring 45m x 76m, which will continue to be used for the purpose of processing and composting FOGO.

The location of this existing building is provided in **Figure 8**.





**Figure 8: Existing Wood Waste Building to be utilised to Receive and Compost FOGO**

### 4.3.2 Composting Process

FOGO received onsite will be unloaded within the fully enclosed building to mitigate odour and noise impacts. The material will then be shredded in a slow speed shredder and placed onto a proprietary Aero-Sorb aerated floor system platform (Aero-Sorb Platform) where the initial composting will take place over a 14-28 day period. The shredded material will be turned on the Aero-Sorb Platform 3 times for the initial composting period, achieving pasteurisation prior to being removed from the building and placed on the external maturation and blending composting system to undergo further composting, particle size reduction, blending and screening. The maturation process will occur for approximately a 6-8 week period. Once the material is pasteurised it is no longer a putrescible waste and almost has no odour where the organics are aerated and turned using the existing four cell Aero-sorb compost platform. The final mature compost is blended for sale into a wide range of horticultural, agricultural and landscape products.

The Aero-Sorb technology has been used by the applicant at several of its operations across NSW. The proposed installation at the subject site, FOGO will be placed on an aerated floor slab where it will be aerated by a series of underfloor aeration pipes, fed by two aeration fans. The system will vent air through the surface of the material into the air space of the building. The air space of the building will then be ventilated to an external biofilter to ensure no fugitive odours are released from the building. Further detail on the biofilter is provided below in **Section 4.3.3**.

The internal layout of the building and the composting operations are shown in **Figure 9**. The full building drawing set is provided as **Appendix E**.

### 4.3.3 Odour Control System

The proposed Odour Control System (OCS) for the building will be designed for the receipt, shredding, and composting operations, and the ventilation of the building through a purpose built biofilter system. The system will be designed to achieve an air exchange rate of four (4) air changes per hour, sufficient to achieve measurable negative pressure conditions, with all access doors closed. This approach represents industry best-practice for odour control for enclosed composting operations in Australia. The ventilation air (approximately 112,000m<sup>3</sup>/hr) will be treated through the biofilter system. The building will be fitted with high-speed roller doors on each truck doorway to ensure minimal escape of fugitive odour emissions during truck entry and exit.

The collected airstream will be humidified prior to biofiltration. Humidification of the air is required to ensure sustainable biofilter performance. Poor humidification results in uneven and potentially dry patches in the biofilter medium, and incomplete odour removal. Humidification will be achieved through the inclusion of an in-duct ultrasonic water spray system. The biofilter system has been proven to be an effective OCS across a wide range of industries both in Australia and overseas.

The biofilter is protected from heavy rain events by the inclusion of a roof covering the biofilter media. The roof will further house solar panels that provide power to the facility.

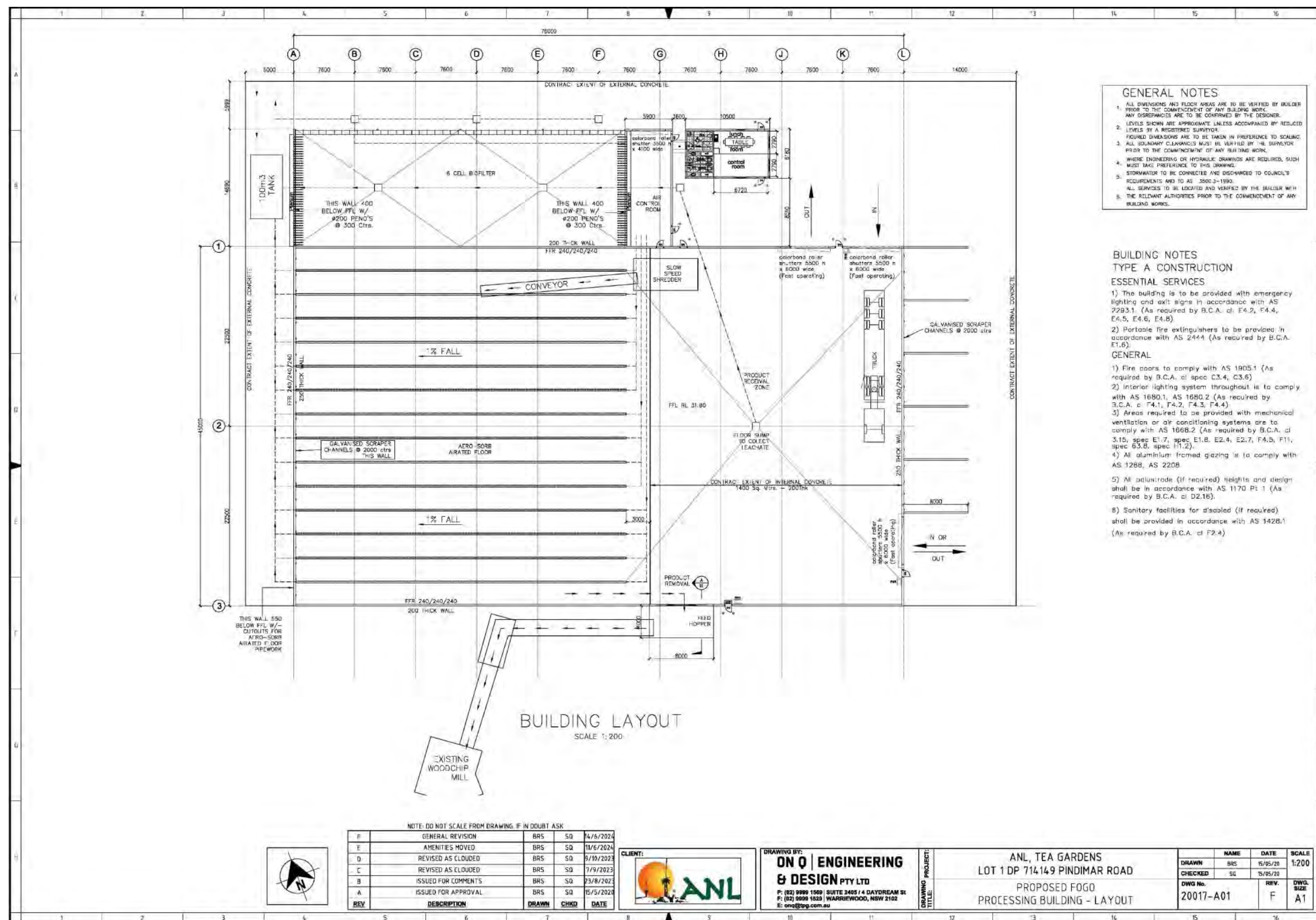


Figure 9: Proposed Internal Building Layout and FOGO Composting Operations





#### 4.3.4 Stockpiling and Loading

Primary stockpiling of materials will occur following initial pasteurisation within the wood waste building. Materials will remain stockpiled on the maturation and blending pad for 6-8 weeks depending on the type and grade of product being produced. The maturation pad is fully concreted and drains to the internal site water management system to ensure no dirty water is released from the site. Water collected in the surface water drainage system is reused across the site for dust suppression, and process control, within the wood waste (ie. FOGO) building for composting and to maintain product stockpile moisture.

Stockpiles are subject to watering on windy days to minimise dust generation.

#### 4.3.5 Material Transport

Speed limits of 10km/hr are to be maintained on site to ensure internal traffic safety. Loads of transported materials are covered to minimise dust generation from loads. The internal roads are concrete and are regularly treated by water trucks to ensure dust emissions from haulage operations are minimised.

Haulage from the site entrance onto Pindimar Road, Mayall Road, and Pacific Highway is bitumen-sealed, therefore dust generation from offsite truck movements is negligible.

#### 4.3.6 Water Supply

The buildings on the site utilise tank water with no connection to the town water supply. Roof water is stored in three 220 kilolitres (kL) rainwater tanks, 2 x 20kL rainwater tanks, and 1 x 50kL tank. This water supplies staff amenities, toilets, and showers. Water is filtered to ensure suitable potable water standards are met.

#### 4.3.7 Services

The following services and utilities are provided at the site:

- **Electricity:** The site is connected to mains power to the local distribution network,
- **Water:** Surface water management systems have been designed to ensure that the development is self-sufficient in terms of its raw water supply. Operational water supply needs are met via the capture and reuse of runoff on site. Potable water supply needs for staff amenities are met via rainwater collection (tanks) from the roofs of onsite buildings. If water levels in the tanks become low due to an extended dry period, potable water can be trucked in as required,
- **Communications:** Mobile phone reception is available onsite. UHF radio is also used between equipment operators,
- **Sewage:** The site is currently serviced by onsite sewerage treatment system, and
- **Site access:** Existing site access will be utilised from Pindimar Road.

There is proposed to be no change to services under the subject application.

#### 4.3.8 Hours of Operation

The hours of operation will remain unchanged from the existing approved operating hours. Operating hours are:

- Monday to Friday 6 am to 6 pm
- Saturday 8 am to 4 pm



- Sunday 8 am to 4 pm (retail sales only)

#### 4.3.9 Work Force

The site currently operates with 15 full time staff. There will be no change to the staffing requirements for this application.

#### 4.3.10 Surface Water and Leachate Management

The site operates under Environment Protection Licence 3877 (EPL 3877). Surface water management onsite has been designed such that no stormwater runoff leaves disturbed areas of the site under normal operating and weather conditions. Runoff is collected and stored onsite in three (3) dams to comply with Condition L1.1 of EPL3877. The stored water is used for a variety of purposes including dust suppression and wetting down of material stockpiles in accordance with Condition O3.1 of the EPL. Any additional water not used for these purposes is utilised for onsite irrigation, which provides a draw down on dam storage levels and limits site discharges.

The current proposal is situated within the footprint of the existing operations area and will utilise the existing drainage and treatment measures, with some minor amendments to manage and contain leachate captured from the FOGO composting building.

The operations area contains three (3) catchments directing flow towards three (3) dams located within the site. All water is captured, treated, and reused for the various operations across the site.

The existing water sensitive design strategy was prepared in 2021 for DA-9/2021 by Tattersall Landers Development Consultants. A revised soil, surface water, and leachate assessment has been prepared, based on the original water sensitive design strategy, and is discussed further in **Section 8.4** of this EIS.





## 5. STATUTORY CONTEXT

### 5.1 OVERVIEW

This section identifies the legislative requirements and planning controls relevant to the Project and outlines the key policy and statutory considerations that would be addressed in more detail in the modification. The Project would be undertaken in accordance with the requirements of relevant environmental and planning legislation.

All associated environmental and planning approvals would be obtained as required under Part 4 of the EP&A Act, including but not limited to:

- Commonwealth and State Government planning approvals
- Local government development approvals
- Operational approvals (such as an Environment Protection Licence)
- Other potential approvals required under relevant environmental and planning legislation and regulations

### 5.2 COMMONWEALTH LEGISLATIVE REQUIREMENTS

#### 5.2.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires approval from the Commonwealth Minister for Climate Change, Energy, and Water (DCCEW) for actions that would have, or are likely to have, a significant impact on matters of National Environmental Significance (NES).

The EPBC Act lists seven matters of NES which must be addressed when assessing the impacts of a proposal, which are:

- World Heritage properties
- National Heritage places
- Wetlands of International Importance
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth Marine Areas
- Nuclear actions

If potential significant impacts on a matter of NES are identified, then a referral to the Minister would be made in accordance with the requirements of the EPBC Act for a determination as to whether the Project is a Controlled action. There are no RAMSAR wetlands located close to the site.

As there is proposed to be no increase in the existing disturbance area of the development as previously assessed, there is unlikely to be any significant impact on relevant matters of NES. Accordingly, it is anticipated that the Project would not need to be referred to DCCEW.

## 5.3 NSW LEGISLATIVE REQUIREMENTS

### 5.3.1 Environmental Planning and Assessment Act 1979

The proposed development is consistent with the overall objectives of the *Environmental Planning and Assessment Act 1979*. Section 5 of the *Environmental Planning and Assessment Act 1979* and the accompanying Regulation provide the framework for environmental planning in NSW and include provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment, and to provide the opportunity for public involvement.

The proposed development is consistent with the nominated objectives of the Act and is considered capable of fulfilling the statutory requirements. The preliminary environmental assessment determined that the proposed development will not result in any significant negative impacts that cannot be adequately mitigated or managed. This will be assessed in detail at the development application stage.

The proposed project triggers 'Designated Development' requiring assessment under Part 4 of the *Environmental Planning and Assessment Act 1979*.

### 5.3.2 Environmental Planning and Assessment Regulation 2021

Under Clause 16 (1) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg), the proposed facility is defined as 'Designated Development'.

#### **16 Composting facilities or works:**

(1) *Development for the purposes of a composting facility or works is designated development if the facility or works process more than 5,000 tonnes per year of organics.*

(2) *Development for the purposes of a composting facility or works is designated development if the facility or works are located—*

(a) *in or within 100 metres of—*

(i) *a natural waterbody, or*

(ii) *a wetland, or*

(iii) *a coastal dune field, or*

(iv) *an environmentally sensitive area of State significance, or*

(b) *in an area of high watertable, highly permeable soils, acid sulfate, sodic or saline soils, or*

(c) *in a drinking water catchment, or*

(d) *in a catchment of an estuary where the entrance to the sea is intermittently open, or*

(e) *on a floodplain, or*

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

As the facility will compost up to 50,000tpa of organic material, the development triggers 'Designated Development'.

### 5.3.3 Protection of Environmental Operations Act 1997

Under the Protection of the Environment Operations Act 1997 (POEO Act), it is an offence to cause water, air, or noise pollution without authorisation for such under an Environment Protection Licence (EPL).

Schedule 1 of the POEO Act details both “Resource Recovery” and “Composting” as ‘Scheduled Activities’. This clause applies to the following activities:

*(12) Composting, meaning the aerobic or anaerobic biological conversion of organics into humus-like products—*

*a) by methods such as bioconversion, biodigestion, or vermiculture, or*

*b) by size reduction of organics by shredding, chipping, mulching, or grinding.*

*(34) Recovery of general waste, meaning the receiving of waste (other than hazardous waste, restricted solid waste, liquid waste, or special waste) from off site and its processing, otherwise than for the recovery of energy.*

These activities are declared to be scheduled activities if it meets the following criteria as shown in **Table 4**.

**Table 4: Scheduled Activities as per Schedule 1 of the POEO Act 1997**

Activity	Relevant Criteria
<b>Composting</b>	where it takes place outside the regulated area and does not receive organics from inside the regulated area—  (i) it has on site at any time more than 2,000 tonnes of organics received from off site, or (ii) it receives from offsite more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics.
<b>Recovery of general waste</b>	if the premises are in the regulated area: (a) involves having on site at any time more than 1,000 tonnes or 1,000 cubic metres of waste, or (b) <u>involves processing more than 6,000 tonnes of waste per year</u> . If the premises are outside the regulated area: (a) involves having on site at any time more than 2,500 tonnes or 2,500 cubic metres of waste, or (b) involves processing more than 12,000 tonnes of waste per year.

Given the proposed facility will process more than 6,000tpa of organic waste and compost more than 5,000tpa of organics, an amended Environment Protection Licence for the facility will be required from NSW EPA.

### 5.3.4 Heritage Act 1977

The Heritage Act 1977 aims to protect and conserve non-Aboriginal cultural heritage, including scheduled heritage items, sites, and relics. The Heritage Act is administered by the Office of Environment and Heritage.

The proposal is not considered to have any adverse effect on any item of heritage significance. Further discussion is provided in **Section 8.6**.

### 5.3.5 Water Management Act 2000

The Water Management Act 2000 provides the legislative basis for water use, management, and planning. It is gradually replacing the planning and management frameworks in the Water Act 1912.

The Act provides for a range of water transactions known as access licence dealings or dealings and the Act also stipulates that a controlled activity approval may be required under the Water Management Act 2000 if works are to be undertaken within 40m of a water body/ watercourse.

There is proposed to be no works undertaken within 40m of a watercourse or the extraction of groundwater under this application.

### 5.3.6 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 provides for the preservation of land, and the protection of that land, as well as the protection of flora and fauna and Aboriginal heritage. An AHIMS search was undertaken on 23.3.2023 covering a 1km radius from the site. The results show there are no Aboriginal sites in or near the site, nor are there any Aboriginal places declared in or near the site. The proposed development is not seeking to increase the existing approved disturbance footprint of the site and will be utilising an existing approved shed for composting activities.

As the development is utilising an existing approved shed and there will be no new or increased ground disturbance, it is anticipated that a full Aboriginal Cultural Heritage Impact Assessment (ACHIA) and full consultation will not be required.

Further discussion is provided in **Section 8.5**.

### 5.3.7 Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive, and resilient environment for the greatest well-being of the community, now and in the future. The BC Act lists threatened species, populations, and ecological communities as well as critical habitat and key threatening processes that must be considered when assessing the effects of an activity.

Development undertaken under Part 4 of the EP&A Act requires assessment to verify whether the development would trigger the Biodiversity Offset Scheme (BOS) and would thus require a Biodiversity Development Assessment Report (BDAR).

In accordance with Section 7.7 of the BC Act, development assessed under Part 4 of the EP&A Act that is not classified as either State Significant Development or State Significant Infrastructure does not automatically trigger the BOS.

As the development is utilising an existing approved shed and there will be no new or increased ground disturbance, it is anticipated that a BDAR will not be required.

### 5.3.8 Waste Avoidance and Resource Recovery Act 2001

The objectives of the NSW Waste Avoidance and Resource Recovery Act 2001 are to encourage efficient use of resources and reduce environmental harm. This is aimed to be achieved with the principles of ecologically sustainable development and considering resource management options against the hierarchy of avoid, reuse, and dispose of.

The Project is consistent with these objectives by facilitating resource recovery and reuse.

### 5.3.9 Biosecurity Regulation Act 2017

The Biosecurity Regulation 2017 identifies certain species of plants and animals as pests and restricts their importation into and sale within NSW. It also contains provisions for the government to declare biosecurity zones for the purposes of controlling outbreaks of proscribed pests.

The sale of compost carries a risk of spreading weed seeds and plant pathogens if these are contained in the feedstock. This is managed through the composting process by ensuring the composting process pasteurises the compost and that the final product is kept apart from the incoming feedstock.



## 5.4 STATE ENVIRONMENTAL PLANNING POLICIES

### 5.4.1 State Environmental Planning Policy (Planning Systems) 2021

The *State Environmental Planning Policy (Planning Systems) 2021* incorporates provisions from the SEPPs consolidated as follows: Chapter 2 - State and Regional Development, Chapter 3 – Aboriginal Lands, and Chapter 4 – Concurrences and Consents.

Schedule 1 of the SEPP identifies development that is considered State Significant Development (SSD). Clause 23 of Schedule 1 relates to *waste and resource management facilities*. For a development for the purpose of waste and recycling to be classified as State Significant, the following applies:

- (3) *Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.*

As the development proposes to process up to 50,000tpa only the Proposal does not trigger SSD.

### 5.4.2 State Environmental Planning Policy (Resilience and Hazards) 2021

#### Chapter 3 – Hazardous and Offensive Development

Chapter 3 of the *State Environmental Planning Policy (Resilience and Hazards)* provides a systematic approach for assessing development proposals for potentially hazardous and offensive industries or storage. Chapter 3 includes definitions of 'hazardous' and 'offensive', relating to risk, and sets out specific assessment requirements for such proposals.

Chapter 3 of the SEPP also sets out requirements for development consent for hazardous or offensive development proposed to be carried out in the Western Division and seeks to ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are considered.

Chapter 3 of the SEPP helps to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and to require the advertising of applications to carry out any such development.

The Hazardous and Offensive Development – “Guideline” sets out a risk screening and threshold procedure to assist in determining whether a particular proposal exceeds specified threshold limits and falls within the definition of a “Potentially Hazardous Industry” or “Potential Offensive Industry”, and therefore whether Chapter 3 of the SEPP applies. A risk screening procedure to determine whether the proposal exceeds the risk threshold criteria will be considered as part of the EIS to determine whether a Preliminary Hazard Analysis is required.

#### Chapter 4 - Remediation of Land

Under Chapter 4 of SEPP (Resilience and Hazards), a consent authority must not consent to the carrying out of any development on land unless:

- a) *it has considered whether the land is contaminated,*
- b) *if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
- c) *if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*



The land has been used for agricultural purposes including cropping and grazing for an extensive period of time, so it is unlikely that that contaminated soil will be present on the site.

### 5.4.3 State Environmental Planning Policy (Transport and Infrastructure) 2021

The *State Environmental Planning Policy (Transport and Infrastructure) 2021* sets out the planning rules and controls for infrastructure, including, Chapter 2 - Infrastructure, Chapter 3 – Educational Establishments and Childcare Facilities, Chapter 4 – Major Infrastructure Corridors, Chapter 5 – Three Ports – Port Botany, Port Kembla, and Newcastle, and Chapter 6 – Moorebank Freight Intermodal Precinct.

Chapter 2 – Infrastructure is applicable to this development. Chapter 2 of the SEPP facilitates the effective delivery of infrastructure across the State by improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and by providing greater flexibility in the location of infrastructure and service facilities.

‘Waste and Resource Management Facilities’ are considered under Division 23 of the SEPP:

*“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”.*

*“Waste disposal facility” means a facility for the disposal of waste by landfill, incineration, or other means, including associated works or activities such as recycling, resource recovery, and other resource management activities, energy generation from waste gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal”.*

*“Waste or resource management facility” means a waste or resource transfer station, a resource recovery facility, or a waste disposal facility”.*

*“Waste or resource transfer station” means a facility for the collection and transfer of waste material or resources, including the receipt, sorting, compacting, temporary storage, and distribution of waste or resources and the loading or unloading of waste or resources onto or from road or rail transport”.*

Under Clause 2.153 of Chapter 2 of the SEPP, the following activities are permitted with consent:

*“Development for waste or resource management facilities, other than development referred to below, may be carried out by any person with consent on land in a prescribed zone”.*

*“Development for the purposes of a waste or resource transfer station may be carried out by any person with consent on land in a prescribed zone”.*

The policy defines ‘prescribed zones’ as being compatible with waste or resource recovery facilities:

- RU1 Primary Production
- RU2 Rural Landscape
- E4 General Industrial
- E5 Heavy Industrial
- IN1 General Industrial



- IN3 Heavy Industrial
- SP1 Special Activities
- SP2 Infrastructure

The proposed development meets the definition of a “Resource recovery facility” under Division 23 of the SEPP. Given the proposed development is to occur in a prescribed RU2 Rural Landscape zone, the development is consistent with Clause 2.153, being development, which is permissible subject to development consent.

## 5.5 LOCAL ENVIRONMENTAL PLANNING POLICIES

### 5.5.1 Great Lakes Local Environment Plan 2014

The existing land zoning under the *Great Lakes Local Environment Plan 2012* (Great Lakes LEP) is RU2 - Rural Landscape. The objectives of the zone are as follows.

#### 1 Objectives of zone

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base*
- *To maintain the rural landscape character of the land*
- *To provide for a range of compatible land uses, including extensive agriculture*
- *To provide for rural tourism in association with the primary industry capability of the land which is based on the rural attributes of the land*
- *To secure a future for agriculture in the area by minimising the fragmentation of rural land and loss of potential agricultural productivity*

The proposed use is generally consistent with the objectives of the zone as the composting facility outputs can be used to improve primary industry production through soil improvement and nutrient enrichment. The proposed activity will not fragment rural land or change the potential agricultural productivity of surrounding land. The setting of the existing site is considered to minimise any visual impact on the landscape quality of the area due to the extensive existing landscaping on the perimeter boundary. As such there will be no change to the rural landscape nature of the area.

Whilst the LEP does not permit the development of either ‘Waste Management Facilities or ‘Resource Recovery Facilities’ in the RU2 zone, Clause 2.153 of SEPP Transport and Infrastructure does permit the development of waste and resource recovery facilities within a ‘prescribed zone’, which includes the RU2 zone.

#### **Clause 7.1 – Acid Sulfate Soils**

The development site is not mapped as having any acid sulfate soil potential. Therefore, acid sulfate soils will not be considered any further in the EIS.

#### **Clause 7.2 - Earthworks**

The proposed composting facility will require limited earthworks under this application as the building to be utilised has been previously assessed and approved by DA-9/2021. Any earthworks proposed are unlikely to have a detrimental impact on drainage patterns or soil stability. Erosion and sediment controls will be implemented to reduce soil run off and control the flow of water on the site.

## **7.5 – Stormwater management**

As the development is an existing approved and operating site, extensive stormwater management infrastructure is currently in place. The stormwater system provides for the separation of clean and dirty water catchments. All dirty water that is captured is treated and reused onsite for dust suppression and the maintenance of soil products for sale. The current system will continue to be utilised.

### **5.5.2 Great Lakes Development Control Plan 2013**

As SEPP Transport and Infrastructure is the planning instrument allowing permissibility of the proposed activity, provisions of the Great Lakes DCP do not apply. Notwithstanding this, the proposed composting activities are considered to align with the overall aims of the Great Lakes DCP, and where possible the development has been designed to meet relevant controls.

## **5.6 OTHER GUIDELINES AND POLICIES**

### **5.6.1 NSW Composting Guidelines**

The NSW *Environmental Guidelines: Composting and Related Organics Processing Facilities* provides a description of the environmental issues associated with composting facilities and provides guidance on how to manage these issues. The guidelines also set out the regulatory framework governing composting facilities in NSW. The guidelines are performance-based, which means alternative management measures can be employed if it can be demonstrated that the performance is at least as good as for those measures included in the guidelines. The performance requirements set out under these guidelines will be considered in the development application for the project.

### **5.6.2 Waste and Sustainable Materials Strategy 2041**

The NSW *Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027* (WSMS) aims to reduce waste and change how the NSW economy produces, consumes, and recycles products and materials. It sets out a vision for transitioning to a circular economy over the next 20 years and gives the actions we will take over the next 6 years to deliver on our long-term objectives.

The strategy includes actions across 3 focus areas:

- meeting our future infrastructure and service needs,
- reducing carbon emissions through better waste and materials management, and
- building on our work to protect the environment and human health from waste pollution.

The targets under the WSMS and the *NSW Plastics Action Plan* are to:

- reduce total waste generated in Australia by 10% per person by 2030,
- achieve an 80% average recovery rate from all waste streams by 2030,
- significantly increase the use of recycled content by governments and industry,
- phase out problematic and unnecessary plastics by 2025,
- halve the amount of organic waste sent to landfill by 2030,
- reduce litter by 60% by 2030 and plastic litter by 30% by 2025, and
- triple the plastics recycling rate by 2030.

This EIS has been prepared in consideration of the relevant objectives of the WSMS.



## 6. STAKEHOLDER ENGAGEMENT

### 6.1 OVERVIEW

This chapter provides an overview of stakeholder engagement for the Project, a description of the stakeholder engagement activities undertaken, and a summary of the findings that have been incorporated into this EIS.

### 6.2 CONSULTATION REQUIREMENTS

The SEARs issued for this Project stated the following be undertaken with regard to consultation.

*“In preparing the EIS for the development, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers, and any surrounding landowners that may be impacted by the development.*

*The EIS must describe the consultation that was carried out, identify the issues raised during this consultation, and explain how these issues have been addressed in the EIS”.*

Consultation is discussed further below.

### 6.3 GOVERNMENT CONSULTATION

Consultation with government agencies was initiated by DPHI during the preparation of the Secretary's Environmental Assessment Requirements (SEARs). The NSW Environment Protection Authority (EPA) was the only agency to provide a formal response to the request for SEARs. Agencies consulted as part of the preparation of this EIS included:

- Mid Coast Council,
- Department of Climate Change, Energy, the Environment and Water (DCCEEW),
- EPA,
- Transport for NSW,
- Water NSW, and
- NSW Fire and Rescue.

A summary of the consultation undertaken with Government agencies is provided in **Appendix C**.

### 6.4 COMMUNITY CONSULTATION

The purpose of the community consultation strategy was to identify the key community stakeholders, present the stakeholders with details of the proposed Project, and provide the stakeholders with an opportunity to give feedback and identify any issues or concerns they may have.

The community consultation program focused upon those landowners adjacent to or likely to be directly impacted upon by the operation of the development.

#### 6.4.1 Project Factsheet

A project factsheet with details of the development was provided to surrounding landowners by mailbox drop on 15 December 2023 and included contact details of where individuals could obtain additional information on the project and provide feedback. The project factsheet provided a summary of existing site operations and development consents, proposed operations, amount to be processed annually, transport of materials, and odour control. Those properties that were unable to be accessed were provided with a copy of the factsheet



by post on 20 December 2023. A total of 27 factsheets were distributed to those residents within a 2km radius of the project site.

A copy of the project factsheet is provided in **Appendix C**.

### 6.4.2 Individual Meetings

Meetings with individual stakeholders were offered, however no requests for meetings were received.

### 6.4.3 Issues Raised

No landowners made contact following the provision of the project factsheet. ANL will continue to liaise with stakeholders as part of their ongoing commitment to community engagement.

## 6.5 ABORIGINAL CONSULTATION

Due to the low impact nature of this development, and the use of an existing approved building for the development, an assessment of impacts on Aboriginal heritage has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (due diligence; DECCW 2010) only. The field inspection has been undertaken in accordance with the *Guide to Investigating, Assessing, and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011). As such, consultation was undertaken directly with the Karuah Local Aboriginal Land Council.

A visual inspection of the study area was undertaken on 23 February 2024 by OzArk Heritage Consultant, Dr. Bernadette Drabsch, and Mr Shane Ping and Mr Ray Feeney from the Karuah Local Aboriginal Land Council. The inspection focused on areas subject to lower levels of disturbance. No Aboriginal objects or areas with the potential to contain subsurface deposits were identified.

Full details of the *Aboriginal Heritage Due Diligence Assessment* are provided in **Section 8.5**

## 7. RISK RANKING

### 7.1 OVERVIEW

To assist in identifying the key environmental and social impacts associated with the Project and the likely severity, an Environmental Risk Assessment (ERA) was undertaken in accordance with Australian Standard AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines. The risk assessment is presented in full as **Appendix D**. The methodology used for the ERA process, and a summary of the results, are outlined below in the following sections.

### 7.2 METHODOLOGY

#### 7.2.1 Key Environmental Impacts

The key environmental and social impacts associated with the Project and requiring further assessment and reporting were identified through:

- The existing environmental context of the site and surrounding locality (**Section 2**),
- The outcomes of consultation undertaken to date with relevant stakeholders (**Section 6**),
- Project SEARs (**Section 1.8**),
- Legislative and statutory framework (**Section 5**), and
- Impact assessment (**Section 8**).

The key environmental and social impacts identified for the Project, in no particular order, are:

- Traffic and transport
- Noise and vibration
- Odour and dust
- Surface water and leachate management
- Aboriginal heritage
- Historic heritage
- Biodiversity
- Bushfire
- Visual
- Waste management
- Socio-economic
- Fire and incident management, and
- Hazards and risk.

#### 7.2.2 Evaluating Likelihood

The key environmental and social impacts of the Project were assigned a likelihood between almost impossible and certain in accordance with **Table 5** (column 1). Column 2 provides a description that elaborates on the possible likelihood categories and column 3 provides the frequency.

**Table 5: Likelihood Table**

Likelihood	Description	Frequency
Certain	Common occurrence	At least daily
Very Likely	Expected to occur in most circumstances	Once per week
Likely	Probably will occur or has happened in the past	Once per month
Unlikely	Occurs infrequently	Less than once per year
Possible	Could happen at some time	Less than once per 10 years
Almost Impossible	Not Likely to occur	Less than 1 per 100 years

### 7.2.3 Evaluating Consequence

The key environmental and social impacts were assigned a consequence between catastrophic and negligible in accordance with **Table 6** (column 1). Columns 2 to 7 provide a guide to the elements considered when evaluating a consequence and column 8 provides the severity level.



**Table 6: Consequence Table**

Consequence	Health and Safety	Natural Environment	Community Relations and Cultural Heritage	Reputation and Media	Legal	Damage / Loss / Business Interruption	Severity Level
Catastrophic	Multiple Fatality	Significant and irreversible impact on threatened species, habitat(s), or ecosystem(s)	Irreparable damage to sites of high cultural significance	Undeniably justified Government condemnation for illegal/unacceptable behaviour	Major prosecutions and fines resulting in incarcerations for senior executives	Significant Financial Loss. >\$10 million	6
Critical	Fatality	Very serious long-term environmental impairment of ecosystem function	Very serious widespread social impact. Irreparable damage to valued cultural items	Prolonged condemnation by media and/or NGO (national outcry)	Significant prosecutions and fines. Very serious litigation, including class actions	Major \$1 M - \$10 M	5
High	Lost Time Injury	Serious medium-term environmental effects	Ongoing serious social issues. Significant but repairable damages to structures/items of cultural significance	Serious public and/or media outcry	A major breach of regulation. Major litigation	High \$100,000 - \$1 M	4
Moderate	Medical Treatment required. Medical Treatment Injury	Moderate short-term effects but not effecting overall ecosystem function	Ongoing social issues. Minor permanent damage to items of cultural significance.	Attention from the media and/or heightened concern by the local community	Moderate legal issues, non-compliances, and breaches of regulation	Low financial Loss <\$100,000	3
Minor	First Aid Treatment	Minor effects on the biological or physical environment	Minor medium-term social impacts	Minor adverse local public or media attention and complaints	Minor legal issues, non-compliances, and breaches of regulation.	Low Financial Loss <\$10,000	2
Almost Impossible	No medical attention. Report only	Limited damage to minimal areas of low significance	Low level repairable damage to commonplace structures	Public concern is restricted to local complaints	Low level legal issues	Min Financial Loss <\$1000	1

## 7.2.4 Risk Assessment Matrix

The key environmental and social impacts were assigned a risk ranking between negligible and catastrophic in accordance with **Table 7**, based on the assessment of likelihood and consequence as described above.

**Table 7: Risk Table**

Likelihood	Consequence					
	Negligible	Minor	Moderate	High	Critical	Catastrophic
6 – Certain	6	12	18	24	30	36
5 – Very Likely	5	10	15	20	25	30
4 – Likely	4	8	12	16	20	24
3 – Unlikely	3	6	9	12	15	18
2 – Possible	2	4	6	8	10	12
1 – Almost Impossible	1	2	3	4	5	6

**Risk Scores:** 1 - 3 = **Low**    4 - 10 = **Moderate**    12 - 16 = **High**    18 - 24 = **Very High**    25 - 36 = **Extreme**

## 7.2.5 Summary of Risk Rankings

**Table 8** below provides a summary of the risk rankings for the environmental and social impacts considered as part of the ERA. The risk assessment did not identify any aspects of the Project with a residual risk of catastrophic or critical. The full Environmental Risk Assessment is provided in **Appendix D**.

**Table 8: Summary of Environmental Risk Assessment**

Risk	Issue
Extreme	None
Very High	None
High	None
Moderate	Traffic and Access Air Quality Noise and Vibration Surface, Groundwater, and Leachate Aboriginal Heritage Biodiversity Cumulative Impacts
Low	Historic Heritage Fire and Incident Management Visual Amenity Socio-economic Waste Management

Where the individual risks were deemed unacceptable, or where a knowledge gap was identified, specialist technical studies were undertaken and additional mitigation measures and or management responses were proposed. The following sections provide a detailed assessment of the key environmental and social impacts of the project as identified above.

## 8. IMPACT ASSESSMENT

This section of the EIS provides a summary of the potential environmental and social impacts of the development and the measures that will be implemented to mitigate and manage these impacts. The issues have been prioritised in accordance with the SEARs, the risk assessment detailed above in **Section 7**, and the outcomes of stakeholder engagement.

### 8.1 TRAFFIC AND TRANSPORT

#### 8.1.1 Introduction

A traffic and transport assessment (included in **Appendix G**) has been prepared by Varga Traffic Planning Pty Ltd to satisfy the SEARs, which requested the following be addressed:

***Traffic and Transport – including:***

- *Details of road transport routes and access to the site.*
- *Road traffic predictions for the development during construction and operation.*
- *Swept path diagrams depicting vehicles entering, exiting, and manoeuvring throughout the site.*
- *An assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.*

#### 8.1.2 Existing Environment

The site is located on the eastern corner of the Myall Way and Pindimar Road intersection. Access to the site is provided via an existing sealed two-way driveway, with a right turn in and a left turn out from and to Pindimar Road. Where the site access road meets Pindimar Road, a concrete apron is installed which prevents the deterioration of the road pavement from turning heavy vehicles. Sight distances both north and south along Pindimar from the entry point are adequate.

The primary access roads to the site are the Myall Way and Pindimar Road. Myall Way intersects with the Pacific Highway approximately 900m east of the site.

Pacific Highway is a State Road and provides the key north-south road link along the central east coast of Australia, linking Brisbane to Sydney. In the vicinity of the site, it typically comprised a dual carriageway that carries two traffic lanes in each direction separated by a wide landscaped median island. Additional lanes are provided at key locations to accommodate turning movements, including at its intersection with Myall Way. Myall Way is a Regional Road and provides the key east-west road link in the area, linking Tea Gardens to the Pacific Highway. It typically carries one traffic lane in each direction in the vicinity of the site, with additional lanes provided at its intersection with Pindimar Road to accommodate turning movements. Pindimar Road is a local, unclassified road which performs the function of a north-south collector route, linking Pindimar and Bundabah to Myall Way. It carries one traffic lane in each direction in the vicinity of the site.

Three traffic controls in the vicinity of the site apply to the road network, listed below:

- A 100 km/h SPEED LIMIT which applies to Pindimar Road,
- A 90 km/h SPEED LIMIT which applies to Myall Way, and
- A GIVE WAY restriction in Pindimar Road where it intersects with Myall Way.

### 8.1.3 Methodology

#### Traffic Survey

A traffic survey provides insight into the existing traffic conditions on the road network in the vicinity of the site, as well as traffic into and out of the site.

#### Traffic Generation

To assess the traffic generation potential of the development proposal, reference is made to Transport for NSW's publication '*Guide to Traffic Generating Developments, Section 3 – Land Use Traffic Generation*' (October 2002), and the updated traffic generation rates outlined in TfNSW *Technical Direction TDT 2013/04a* (August 2013).

*TDT 2013/04a* serves as a replacement for specific sections of the TfNSW Guidelines and is mandated for use by TfNSW in trip generation and parking demand assessments.

While both the TfNSW Guidelines and the updated *TDT 2013/04a* document are based on extensive surveys covering a wide range of land uses, they do not provide a specific traffic generation rate applicable to a resource recovery facility. Therefore, for the purpose of this assessment, a “first principles” approach has been undertaken for the traffic assessment for the site.

#### SIDRA Movement – Road Network Capacity

SIDRA is a traffic analysis program widely used by Transport for New South Wales (TfNSW) and many LGAs for evaluating the traffic implications of development proposals. It facilitates the assessment of how additional traffic flows resulting from proposed developments may impact the operational performance of the surrounding road network.

#### Criteria for Interpreting Results of Sidra Analysis

##### 1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control modes.	At capacity and requires other control modes.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control modes.

##### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVDs listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner-city conditions) and on some roads (i.e., minor side streets intersecting with a major arterial route).



Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control modes.	At capacity and requires other control modes.

### 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

## 8.1.4 Impact Assessment

### Existing Traffic Condition

Traffic surveys were undertaken on Wednesday 15<sup>th</sup> November 2023 between 6:30 am-9:30 am and 3:30 pm-6:30 pm to determine traffic movements at the following intersections:

- Myall Way and Pindimar Road
- Pindimar Road and the site access driveway

The following peak hour movements are detailed below for the above period. **Figure 10** below shows the existing peak hour traffic flows and **Table 9** shows the traffic counts for the period.

<sup>1</sup> The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

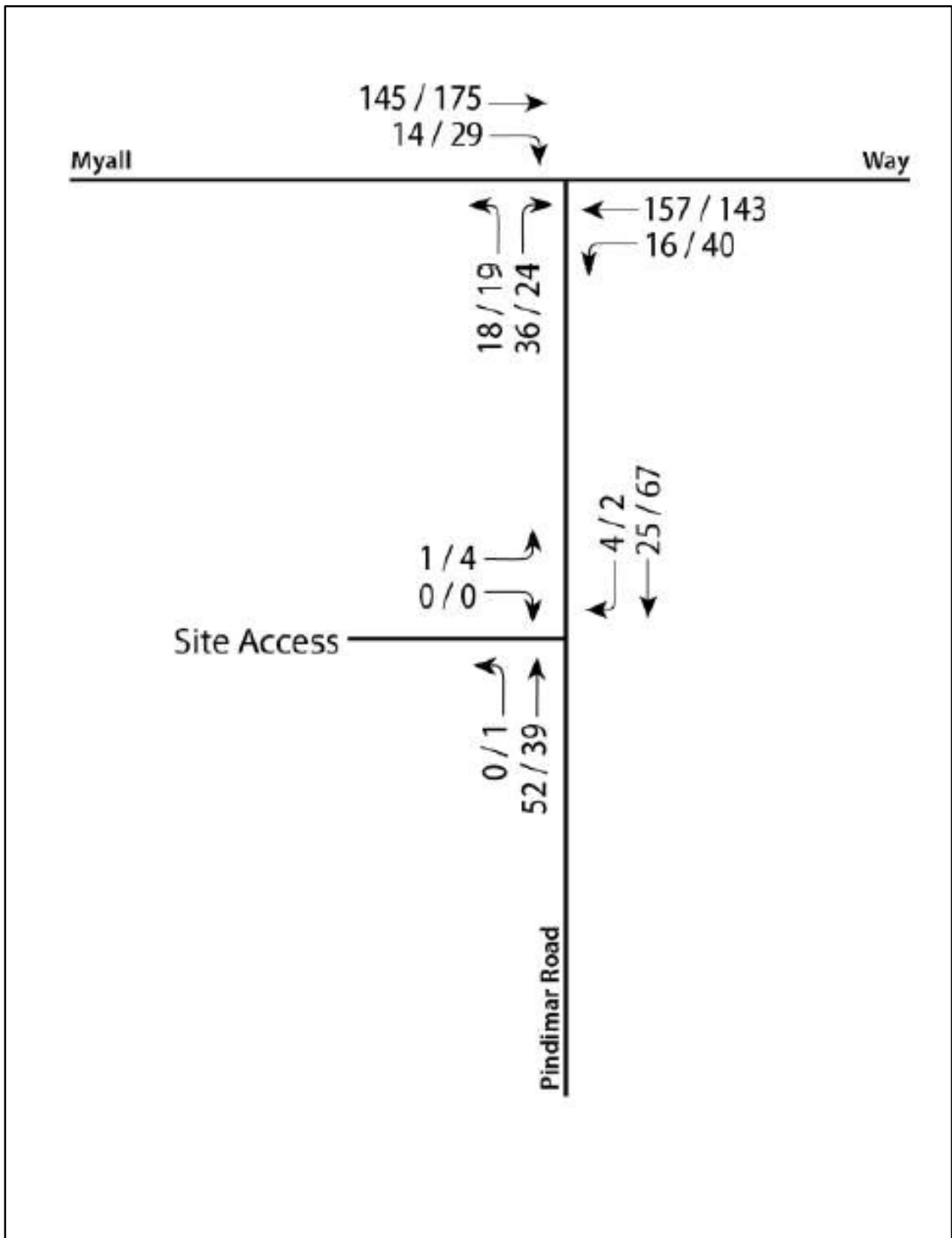


Figure 10: Existing Peak-Hour Traffic Flows

Table 9 provides the type and number of movements for each path during the count period.

**Table 9: Traffic Counts**

Path	Total 8:30 am to 9:30am	Total 15:30 to 16:30
Light Vehicle -LV	72	99
Heavy Vehicle-HV	11	15

The summary of the traffic surveys is represented below:

- Eastbound traffic flows in Myall Way past the site frontage are typically in the order of 159 vph during the AM peak period, *increasing* to 205 vph during the PM peak period,
- Westbound traffic flows in Myall Way past the site frontage are typically in the order of 175 vph during the AM peak period, decreasing to 162 vph during the PM peak period,
- Southbound traffic flows in Pindimar Road past the site frontage are typically in the order of 25 vph during the AM peak period, increasing to 67 vph during the PM peak period,
- Northbound traffic flows in Pindimar Road past the site frontage are typically in the order of 52 vph during the AM peak period, decreasing to 39 vph during the PM peak period, and
- The site generates approximately 5 vph during the AM peak period, increasing to 7 vph during the PM peak period (IN/OUT combined).

### **Traffic Generation**

The Project's primary objective is to address the growing demand for resource recovery infrastructure in regional NSW, while concurrently considering the traffic implications of development proposals. These implications primarily concern the effects of the additional traffic flows generated by development and their impact on the operational performance of the adjacent road network.

There will be *no change* to the existing staff numbers, associated operating hours, or the number of organics received onsite per year, which will remain unchanged at 150,000tpa. As such, the Project is not expected to result in any appreciable change in traffic and parking demands currently generated by the site.

The *nett change* in the traffic generation potential of the site as a consequence of the development proposal will therefore be *statistically insignificant* and will not have any unacceptable traffic implications in terms of road network capacity, as demonstrated by the following section of this report.

### **Road Network Capacity**

The primary concern regarding development proposals lies in the traffic implications, particularly the effects that any additional traffic flows may have on the operational performance of the nearby road network. This effect is assessed using the SIDRA program for the Project.

The results of the SIDRA analysis of the adjacent intersection are summarised in Table x and reveal that the Myall Way/Pindimar Road intersection operates at Level of Service "A" during the commuter peak period.

**Table 10: SIDRA Modelling Results**

Intersection	Key Indicators	Existing Traffic Demand	
		AM	PM
Myall Way & Pindimar Road	LOS	A	A
	DS	0.073	0.089
	AVD	1.6	2.2
Pindimar Road & Site Access	LOS	A	A
	DS	0.030	0.041
	AVD	0.5	0.5

*LOS – Level of Service; DS – Degree of Saturation; AVD – Average Vehicle Delays (secs/veh)*

The SIDRA capacity analysis of the Project demonstrates the following results :

- The project will not have any unacceptable traffic implications in terms of road network capacity, and
- No road improvements or intersection upgrades are required as a consequence of the Project.

#### **Parking Implication**

##### **Existing Kerbside Parking Restrictions**

The existing kerbside parking restrictions that apply to the road network in the vicinity of the site are illustrated in **Figure 11** and comprise:

- NO STOPPING restrictions along both sides of Mywall Way and Pindimar Road, and
- A BUS ZONE on MyWall Way, adjacent to its intersection with Pindimar Road.



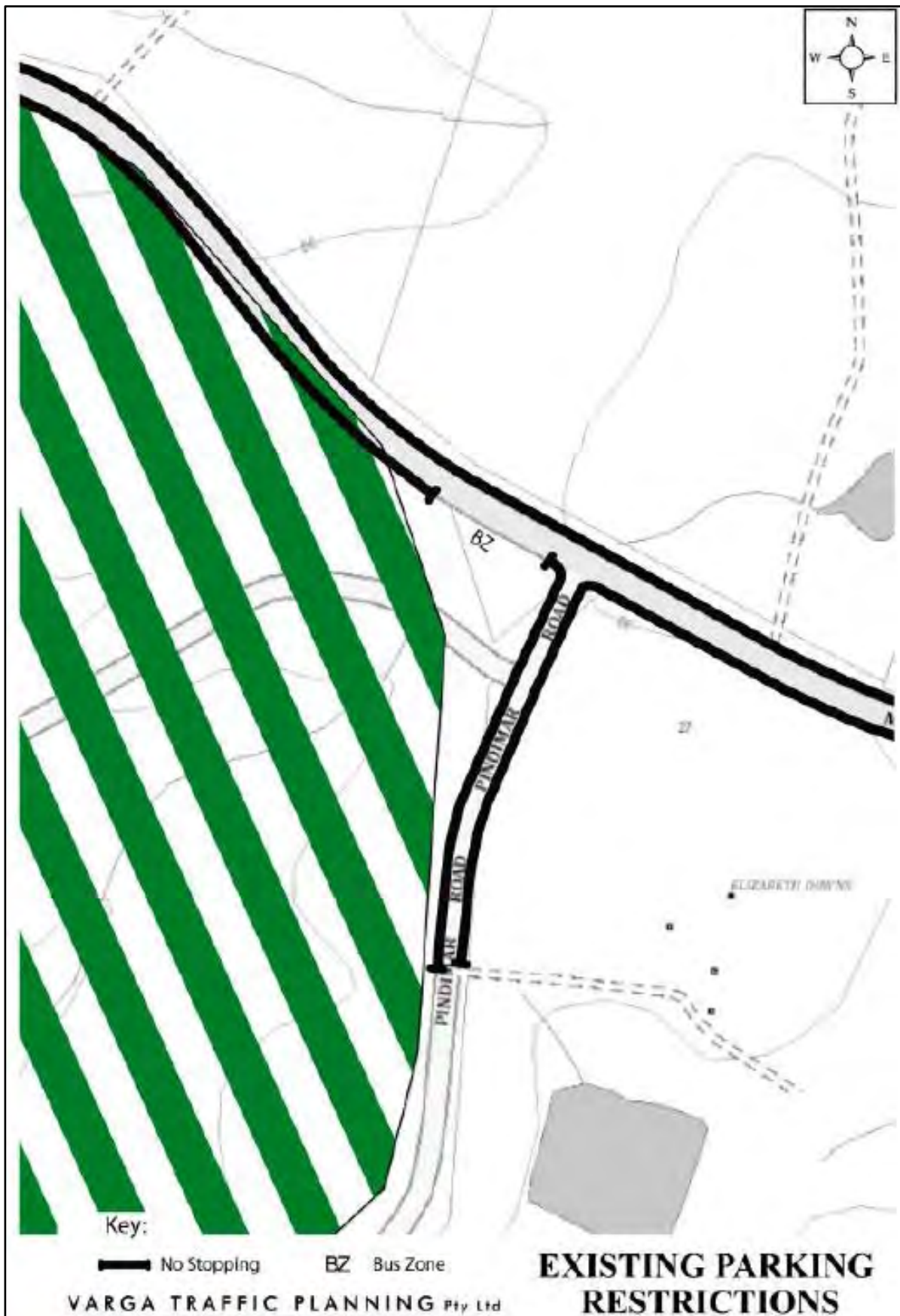


Figure 11: Existing Parking Restrictions



## Off-Street Parking Provisions

As *State Environmental Planning Policy (Transport and Infrastructure) 2021* is the planning instrument allowing permissibility of the proposed activity, provisions of the Council's *Great Lakes Development Control Plan 2013* do not apply. The primary purpose of the Project is to service the increased need and demand for resource recovery infrastructure in regional NSW.

Onsite, there are 28 car parking spaces currently provided for staff and visitors adjacent to both the site office and the approved baling shed. Truck parking, and an associated turning area, are currently provided immediately north of the approved hay shed. All operational areas of the site are concrete hardstands that provide all-weather access. Concrete also provides a durable surface for the operation of plants and equipment.

Currently, the site is approved to process up to 150,000tpa of materials which equates to approximately 45 truck movements per day.

There will be no change to the existing staff numbers, associated operating hours, and the amount of organics received onsite per year. As such, the proposed development is not expected to result in any appreciable change in the approved traffic and parking demands generated by the site.

## 8.1.5 Mitigation and Conclusions

The Project aims to receive and compost up to 50,000 tpa of FOGO within the existing wood waste processing building, while reducing wood waste materials to 100,000tpa, maintaining the total received tonnages of organics at 150,000tpa. This ensures no increase in the annual intake of organics.

The purpose of this development is to address the growing demand for resource recovery infrastructure in regional NSW, assisting local councils and the NSW Government in meeting the target of diverting all household food and garden organics from landfills in all LGAs by 2030.

The SIDRA capacity analysis of the nearby intersections located around the perimeter of the site indicates that:

- all intersections operate at Levels of Service "A", and
- no road improvements or intersection upgrades would be required as a consequence of the development proposal.

The Project will not alter existing staff numbers, operating hours, or the number of organics received onsite per year. Consequently, no significant changes are expected in approved traffic and parking demands generated by the site. Therefore, the Project will not have any unacceptable implications in terms of road network capacity, vehicular access, or off-street parking/loading requirements.

## 8.2 NOISE AND VIBRATION

### 8.2.1 Introduction

A *Noise and Vibration Assessment* (included in **Appendix H**) has been prepared by Koikas Acoustics Pty Ltd to satisfy the SEARs, which requested the following is addressed:

#### **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.

## 8.2.2 Existing Environment

### Noise Sensitive Receivers

The site is located at the junction of Pindimar Road and Myall Way. The nearest noise-sensitive properties (refer to **Figure 10**) are residential dwellings to the east, south, and west of the site, being:

- 196 Myall Way, Tea Gardens,
- 124 Pindimar Road, Tea Gardens,
- 87 Pindimar Road, Tea Gardens, and
- 27 Pindimar Road, Tea Gardens.

196 Myall Way (Receiver 1) is currently a vacant block with no residence. The structure observed on the site is a metal shed. Correspondence documented between the previous acoustic consultant (West and Associates Pty Ltd) and Mid-Coast Council appears to suggest that noise must still be assessed at the vacant block presuming that it may be occupied in the future.

### Background Noise Levels

Noise logging was conducted at each of the four (4) nearest residential properties to establish prevailing ambient and background noise conditions. The loggers were on-site from 5 November 2021 to 19 November 2021. The measurement microphone was about 1.5 metres above the natural ground and placed away from sound-reflective surfaces such that recorded data is deemed to represent free-field conditions.

The following instruments were used:

- 1. Svantek 977, installed at 196 Myall Way,
- 2. NTi Audio XL2, installed at 124 Pindimar Road,
- 3. BSWA 801, installed at 87 Pindimar Road, and
- 4. Svantek 957, installed at 27 Pindimar Road.

Each instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were stored within the logger memory at recurring 15-minute intervals. G.R.A.S. acoustic windscreens were fitted over each measurement microphone to eliminate the possibility of wind-induced noise influencing the surveyed noise levels.

A NATA-calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. No system drift was observed for any instrument.

Detailed weather survey information was procured from the Bureau of Meteorology (BoM) for the Williamtown RAAF weather station (ID 61078). This was the nearest available weather station that recorded both wind speed and rainfall data at a suitable resolution to allow an accurate correlation of the weather data to noise data at 15-minute intervals. The Williamtown RAAF site is approximately 30 km from the subject site.

An extended two (2) weeks survey period was adopted so that sufficient data was recorded that could account for any data that may have been lost due to adverse weather conditions throughout the monitoring period.

A summary of the recorded background noise levels for the following periods is shown in **Table 11**:

- DAY - (7 am to 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday), and
- NIGHT - (6 am to 7 am Monday to Friday).

It is noted that the periods correspond to the ANL operation hours.

**Table 11: Summary of Background Noise Levels (dB)**

Day		ABL – Logger 1		ABL – Logger 2		ABL – Logger 3		ABL – Logger 4
	Night	Day	Night	Day	Night	Day	Night	Day
Sat 6 Nov 2021	n/a	41	n/a	36	n/a	38	n/a	40
Sun 7 Nov 2021	n/a	37	n/a	32	n/a	34	n/a	37
Mon 8 Nov 2021	38	38	Ext	32	33	38	40	42
Tue 9 Nov 2021	41	40	34	33	35	34	39	39
Wed 10 Nov 2021	42	42	39	35	40	37	40	39
Thu 11 Nov 2021	41	41	36	32	49	36	42	43
Fri 12 Nov 2021	41	44	39	37	39	40	41	44
Sat 13 Nov 2021	n/a	50	n/a	47	n/a	49	n/a	50
Sun 14 Nov 2021	n/a	46	n/a	43	n/a	46	n/a	46
Mon 15 Nov 2021	43	46	41	41	39	45	40	48
Tue 16 Nov 2021	45	40	External battery life exhausted – equipment shutdown after 10 days		39	35	42	41
Wed 17 Nov 2021	42	41			38	37	39	39
Thu 18 Nov 2021	43	40			41	36	42	39
Fri 19 Nov 2021	43	42			40	38	42	42
<b>RBL</b>	<b>42</b>	<b>40</b>	<b>38</b>	<b>33</b>	<b>39</b>	<b>37</b>	<b>41</b>	<b>40</b>

**Day:** 7 am – 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday **Night:** 6 am – 7 am Monday to Friday

**ABL** = Assessment background level

**RBL** = Rating background level

Highlighted cells indicate data excluded from the derivation of the RBLs following EPA monitoring and analysis procedures for weather-affected data.

'Ext' refers to an extraneous noise event corrupting the noise data.

"n/a" refers to a period that has no relevance as the facility will not be operating.

Logger data at each of the monitoring locations suggest marginally higher background levels during the 6 am to 7 am 'night shoulder' period (weekdays) than for the 'day' period between 7 am and 6 pm. This would appear to coincide with increased morning traffic movements attributed to people leaving for work.

The data recorded at Locations 1 and 4 appears to show general agreement which would appear to make sense given the similar setbacks from Myall Road.

The loggers at locations 2 and 3, both further removed from Myall Road again show agreement during the night shoulder period where traffic along Myall Road dominates the ambient noise environment. The additional setback from the road would appear to correctly account for the lower measured noise level than for locations 1 and 4.



The higher daytime noise level at Location 3, when compared to Location 2, would again be expected with traffic movements along Pindimar Road becoming more prominent throughout the day. Location 3 has greater exposure to the road and is less setback than Location 2.

Koikas Acoustics is satisfied that the background noise data obtained from the four (4) logging surveys conducted around the ANL site, and the derived RBLs are suitable for use in defining the project noise trigger levels under the NSW Environmental Protection Authority Noise Policy for Industry (NPFII).

### **Existing Approved Uses**

Key features of the primary buildings and their respective uses are described as follows:

#### **Hay Baling and Storage Sheds**

- The storage shed is approximately 18 m x 45 m x 7 m with the northern side of the building fully open.
- A large opening also exists in the eastern façade.
- The storage shed is a relatively low-noise area where hay bales are stored.
- The use of a forklift is the only noise-generating source.
- The baling shed is approximately 12 m x 60 m x 7 m with the northern side of the building fully open.
- This building houses an in-feed conveyor and baler along with the out-feed conveyor and baler.
- Noise levels used within this report are from measurements conducted and reported on by Ray Walsh Acoustics for the ANL facility in Holbrook.
- The baling shed at the Holbrook site was predominantly an enclosed building whereas the Tea Gardens proposal is for the entire northern façade of the shed to be open.

#### **Packaging Building and Workshop**

- The building is approximately 33 m x 15 m.
- Works taking place within this area are typical engineering works thus the internal noise levels will be commensurate with typical workshop noise levels.
- Workshop noise levels used in the assessment have been sourced from measurements conducted elsewhere by Koikas Acoustics.

#### **Wood Waste Processing Building**

- The building is approximately 69 m x 45 m x 12 m.
- The building is used to process wood waste and will be used to process FOGO material.
- Processing and sorting equipment is located internally such as a shredder and screener.
- Trucks are loaded and unloaded internally and with all doors closed.
- Sound power levels for equipment and work processes are derived from noise measurements conducted by Koikas Acoustics at the Tea Gardens site.





Figure 12: Noise Sensitive Receivers

## 8.2.3 Methodology

### 8.2.3.1 Noise Criteria/Trigger Levels

#### **Noise Policy for Industry**

The NPFI is provided as a guide in determining suitable project noise objectives when assessing environmental noise impacts associated with scheduled activities prescribed within Schedule 1 of *the Protection of the Environment Operations Act 1997*. It is also commonly used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

#### **Intrusive and Amenity Noise Levels**

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level). The most stringent of the project intrusive noise level and project amenity noise level are applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same. As the intrusive noise level is defined in terms of an  $L_{Aeq, 15 \text{ minutes}}$  and the amenity noise level are defined in terms of an  $L_{Aeq, \text{Period}}$ , a correction +3 dB correction is applied to the project amenity noise level to equate the  $L_{Aeq, \text{Period}}$  to  $L_{Aeq, 15 \text{ minutes}}$ .

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category. There are no non-residential receivers nearby the facility that require assessment.

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when deciding on acceptable noise outcomes.

The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs, which is limited in this case to daytime hours of 7 am to 6 pm (Monday to Friday and 8 am to 4 pm (Saturday and Sunday), and a 6 am to 7 am night shoulder period (Monday to Friday only).

NPFI planning levels for noise sensitive receivers are shown in **Table 12**.

**Table 12: NPFi Planning Levels - LAeq, 15 minutes (dB)**

Period, T (Note 1)		Intrusive	Amenity					
	RBL	RBL + 5	Area Classification	Recommended Amenity Noise Level	High Traffic Area	Project Amenity Noise Level	+3dB Correction	PNTL
Receiver 1 – 196 Myall Way								
Day	40	45	Rural	50	No	45	48	45
Night	42	47	Rural	40	No	35	38	38
Receiver 2 – 124 Pindimar Road								
Day	33	38	Rural	50	No	45	48	38
Night	38	43	Rural	40	No	35	38	38
Receiver 3 – 87 Pindimar Road								
Day	37	42	Rural	50	No	45	48	42
Night	39	44	Rural	40	No	35	38	38
Receiver 4 – 27 Pindimar Road								
Day	40	45	Rural	50	No	45	48	45
Night	41	46	Rural	40	No	35	38	38

Note 1: Day: 7 am – 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday, Night: 6 am – 7 am Monday to Friday.

Note 2: Project noise amenity level = recommended noise amenity level – 5 dB, except where specific circumstances are met, such as high traffic.

### **Maximum Noise Levels (Sleep Disturbance)**

The potential for noise-induced sleep disturbance should be considered where a noise source or activity from a particular development occurs before 7 am (Monday to Saturday) or 8 am (Sundays or public holidays) and/or after 10 pm (Monday to Sunday).

Section 2.5 of the NPfI describes a screening assessment method that identifies the potential for sleep disturbance at residential receivers. Where the screening levels are exceeded, a more detailed maximum noise level assessment is required.

The screening levels noted below are applied in two stages relative to the LAeq 15 minutes and LAFmax source noise levels:

- LAeq 15 minutes 40 dB or the prevailing RBL + 5, whichever is the greater, and/or
- LAFmax 52 dB or the prevailing RBL + 15, whichever is the greater.

Sleep disturbance screening levels are provided below in **Table 13**.

**Table 13: Sleep Disturbance Screening Levels**

Receiver Location	Assessment Period	L <sub>Aeq</sub> , 15 min Noise Level	L <sub>A</sub> Fmax Noise Level
R1: 196 myall Way	6 am to 7 am (Mon-Fri)	47 (RBL + 5)	57 (RBL + 15)
R2: 124 Pindimar Road	6 am to 7 am (Mon-Fri)	43 (RBL + 5)	53 (RBL + 15)
R3: 87 Pindimar Road	6 am to 7 am (Mon-Fri)	44 (RBL + 5)	54 (RBL + 15)
R4: 27 Pindimar Road	6 am to 7 am (Mon-Fri)	46 (RBL + 5)	56 (RBL + 15)

Where the screening assessment identifies a potential for sleep disturbance, a further and more rigorous analysis of the maximum noise levels attributed to the noise source or activity under assessment is prepared. This detailed assessment would:

- Compare the maximum noise levels and the number of maximum noise events from the subject source or activity to that of typical ambient maximum noise events in the local area such as from passing traffic etc.
- Assess the maximum event noise level inside an affected residence and compare this to further guidance on sleep disturbance impacts presented in the NSW EPA Road Noise Policy (RNP).
- Present a final opinion on the potential for sleep disturbance and/or the need for any specific noise mitigation and/or management.

It is also important to recognise that the point at which noise causes sleep disturbance is currently not well known and that the EPA advises that “more research is needed to better understand this relationship”. Therefore, the above should be used as a guide only and applied with caution on a case-by-case basis.

### **Project Noise Criteria Summary**

**Table 14** shows a summary of the relevant noise assessment criteria at each of the four (4) identified nearest residential properties as it relates to the current application.

**Table 14: Summary of Project Noise Criteria**

Receiver Location	Operational Noise	
	PNTL	Sleep disturbance
R1: 196 Myall Road	L <sub>Aeq</sub> 15 min (day) 45 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 47 L <sub>Amax</sub> 57
R2: 124 Pindimar Road	L <sub>Aeq</sub> 15 min (day) 38 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 43 L <sub>Amax</sub> 53
R3: 87 Pindimar Road	L <sub>Aeq</sub> 15 min (day) 42 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 44 L <sub>Amax</sub> 54
R4: 27 Pindimar Road	L <sub>Aeq</sub> 15 min (day) 45 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 46 L <sub>Amax</sub> 56

Noise levels are assessed at a height of 1.5 metres above the ground at the most affected point on or within the residential property boundary. Where the residence is more than 30 metres from the property boundary, noise is assessed at the most affected point on or within 30 metres of the residence.

## **8.2.4 Impact Assessment**

### **8.2.4.1 Noise Model**

Predictive modelling (CadnaA) has been used to assess noise levels at each of the identified residential receiver locations. The CadnaA prediction model calculates according to the standard sound propagation algorithms defined in ISO9613, considering the local topography, ground condition, and the presence of noise reflectors/barriers. Equation (3) of ISO9613 (which is adopted by the modelling program) calculates a downwind sound pressure level consistent with wind speeds of 2-5 m/s and moderate temperature inversions.



The acoustic assessments consider a range of design parameters that directly influence the output of the noise prediction model. A summary of the relevant design parameters is provided below:

- Source to receiver wind speeds of 3 m/s at 10 m above ground level,
- Ground absorption is generally taken as 0.7 for moderately porous ground, except for the subject site where a ground absorption of 0.02 is considered for the concrete hardstands,
- Foliage attenuation considered between the subject site and Receivers 1 and 2 presumes 5 m high trees,
- Cumulative noise levels are calculated for all existing and proposed noise sources, assessed over any 15 minutes. All plant and equipment and work processes are considered operational at the same time and no corrections for source duration are applied. This presents a worst-case assessment scenario that is unlikely to occur during a typical operation, and
- An extensive survey of existing plant and equipment noise levels at the Tea Gardens facility has been conducted by Koikas Acoustics. This data is used where possible and appropriate to represent noise emission from existing and proposed plant and equipment and site operations. Additional data collected by Ray Walsh Acoustics for another ANL baling and storage shed at Holbrook is used to predict noise emissions from these new buildings. Koikas Acoustics database noise levels are used elsewhere where no site-specific noise data is available.

#### 8.2.4.2 Operational Noise

Noise emission from the ANL Tea Gardens facility when operating under the proposal which would allow receipt and processing of FOGO materials in addition to the existing approved wood waste materials is assessed to surrounding residential receivers.

#### Assessment Scenarios

The following design scenarios as listed in **Table 15** have been assessed.

**Table 15: Design Scenarios and Assumptions**

Scenario	Description
1A [Day]	<ul style="list-style-type: none"> <li>• Four trommel screens operating and being loaded.</li> <li>• One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li> <li>• The silt trap pump is operating continuously.</li> <li>• Two truck movements are assessed, one inward and one outward.</li> <li>• High-speed grinder operating inside the wood waste processing shed (roller doors closed).</li> <li>• All other buildings are assessed with roller doors open.</li> </ul>
1B [Day]	<ul style="list-style-type: none"> <li>• Four trommel screens operating and being loaded.</li> <li>• One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li> <li>• The silt trap pump is operating continuously.</li> <li>• Two truck movements are assessed, one inward and one outward.</li> <li>• Low-speed shredder operating inside the wood waste processing shed (roller doors open).</li> <li>• All other buildings are assessed with roller doors open.</li> </ul>



Scenario	Description
2 [Night]	<ul style="list-style-type: none"> <li>No external screeners are permitted to operate between 6 am and 7 am.</li> <li>One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li> <li>The silt trap pump is operating continuously.</li> <li>Two truck movements are assessed, one inward and one outward.</li> <li>Roller doors in the wood waste processing shed must be kept closed.</li> <li>All other buildings are assessed with roller doors open.</li> </ul>
3 [Night]	<p><b>SLEEP DISTURBANCE</b></p> <ul style="list-style-type: none"> <li>All plant and equipment (excluding outdoor screeners and shredders).</li> <li>Wood waste processing shed roller doors must be closed at all times and the grinder must not be used.</li> <li>All other buildings are assessed with roller doors open.</li> <li>Two truck movements (one inward and one outward).</li> </ul>

### Source Noise Levels

Noise levels used in the acoustic model have been sourced from:

- Measurements taken by Koikas Acoustics at the existing ANL Tea Gardens site,
- Measurements taken by Ray Walsh Acoustics at another ANL facility in Holbrook, and
- Database noise levels from previous measurements conducted by Koikas Acoustics at other similar sites.

**Table 16** lists the sound power levels for all equipment.

**Table 16: Noise Level Data,  $L_{Aeq}$  (dB)**

Source	Noise Metric	1/1 Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	Total
Externally located noise sources around the site										
Existing silt trap pump	SWL	78	79	82	90	93	93	89	84	98
Excavator	SWL	76	86	90	89	90	89	86	80	97
Loader	SWL	64	73	80	86	98	92	79	70	99
Screener 1 and loading	SWL	81	93	94	96	96	92	88	81	102
Screener 2 and loading	SWL	79	84	90	94	95	96	90	82	101
Screener 3 and loading	SWL	75	75	81	92	95	96	94	87	101
Turbo Powerscreen	SWL	94	97	93	96	97	96	92	89	104
Truck moving at 10 kph	SWL	72	77	83	85	86	83	80	70	91
Hay bailing shed										
Vacuum sealer and baler	SWL	60	68	80	84	82	89	89	89	95

Source	Noise Metric	1/1 Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	Total
Conveyor and baler	SWL	74	91	99	100	97	93	89	83	105
<b>Hay storage shed</b>										
Forklift	SWL	71	81	75	81	82	80	78	69	88
<b>Workshop</b>										
Engineering workshop internal room noise level	SPL (Room)	40	51	53	58	63	72	73	68	77
<b>Existing packaging and distribution shed</b>										
Truck idling	SWL	69	71	75	85	92	90	85	75	95
Forklift loading truck	SWL	71	81	75	81	82	8	78	69	88
<b>Wood Waste Processing shed</b>										
Aerosorb fan	SWL	69	81	83	85	88	86	81	70	93
Aerosorb fan	SWL	69	81	83	85	88	86	81	70	93
Screeners	SWL	94	97	93	96	97	96	92	89	104
Low-speed shredder	SWL	80	90	94	98	99	97	93	89	104
High-speed grinder	SWL	94	105	108	112	113	111	107	102	118
Truck being loaded using a wheeled loader	SWL	92	86	89	94	97	96	94	90	102

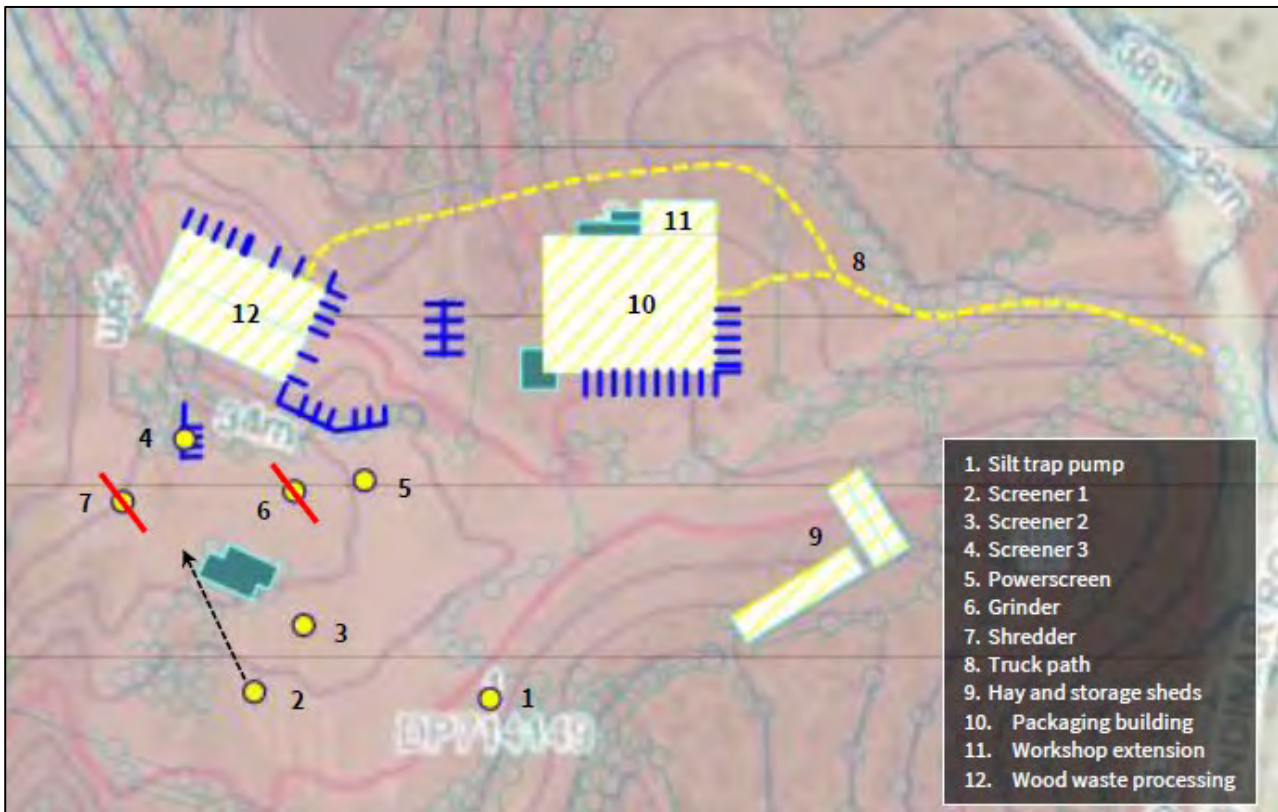
**Table 17** presents the total sound power level for all equipment within each building and the calculated reverberant room noise level in each building.

**Table 17: Noise Level Inside Buildings, LAeq (dB)**

Source	Noise Metric	1/1 Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	Total
Hay bailing shed										
Total sound power level	SWL (Total)	74	91	99	100	97	95	92	90	105
Reverb room noise level	SPL (Room)	54	70	79	80	77	74	71	69	85
Hay storage shed										
Total sound power level	SWL (Total)	71	81	75	81	82	80	78	69	88
Reverb room noise level	SPL (Room)	52	63	56	63	63	62	59	51	70
Workshop										
Engineering workshop internal room noise level	SPL (Room)	40	51	53	58	63	72	73	68	77
Existing packaging and distribution shed										
Total sound power level	SWL (Total)	73	82	78	87	92	91	86	76	96
Reverb room noise level	SPL (Room)	50	59	55	64	70	68	63	53	73
Wood Waste Processing Shed (low-speed shredder operating)										
Total sound power level	SWL (Total)	96	98	97	101	103	101	98	94	108
Reverb room noise level	SPL (Room)	71	72	71	74	76	74	70	64	82
Wood Waste Processing Shed (high-speed grinder operating)										
Total sound power level	SWL (Total)	98	106	108	112	114	112	107	103	118
Reverb room noise level	SPL (Room)	73	80	82	85	87	85	79	73	92

**Figure 13** presents a layout indicating the location of each noise source as it was during the attended surveys conducted by Koikas Acoustics, and as per the approved building locations.

It is noted that items 6 and 7, being the low-speed shredder and high-speed grinder are relocated within the new wood waste processing building and item 2 which is showing in the maturation bed is moved further north.



**Figure 13: Location of Site Noise Sources**

#### **Receiver Levels – Scenario 1A (Daytime)**

The following noise levels are calculated for each of the identified surrounding residential receivers. As each residence is greater than 30 m from the boundary, noise levels are assessed at the most affected point within 30 m of the residence. Other pertinent information regarding the model includes:

- All noise sources are presumed to operate constantly for over 15 minutes, excluding the truck movements where the noise duration is controlled by the vehicle's speed and distance of travel,
- The high-speed grinder is located inside the wood waste processing building. During the use of the high-speed grinder, the building doors must be closed,
- All roller doors to the packaging building and workshop are presumed open,
- Two truck movements are presumed to occur in any 15 minutes, one (1) to the existing packaging shed and the other to the wood waste processing shed,
- Sound transmission through tilt-up masonry walls will be negligible and does not warrant inclusion in the noise model, and
- Sound transmission through the roof is based on sound transmission loss data for insulated roof panels (Rw 24).

**Table 18: Scenario 1A Receiver Levels,  $L_{Aeq}$  15-minutes, dB**

Receiver	Noise Objective	Predicted Noise Level	Assessment Result
R1: 196 myall Way	45	43	Complies
R2: 124 Pindimar Road	38	35	Complies
R3: 87 Pindimar Road	42	40	Complies
R4: 27 Pindimar Road	45	43	Complies

### **Receiver Levels – Scenario 1B (Daytime)**

Scenario 1B considers the same noise sources as those from Scenario 1A but with one exception being the low-speed shredder is operating within the wood waste processing shed rather than the high-speed grinder. Considering that the low-speed shredder generates substantially lower noise than the high-speed grinder, the model allows for the roller doors to the wood waste processing shed to be **OPEN**.

**Table 19: Scenario 1B Receiver Levels,  $L_{Aeq}$  15-minutes, dB**

Receiver	Noise Objective	Predicted Noise Level	Assessment Result
R1: 196 myall Way	45	43	Complies
R2: 124 Pindimar Road	38	34	Complies
R3: 87 Pindimar Road	42	40	Complies
R4: 27 Pindimar Road	45	43	Complies

### **Receiver Levels – Scenario 2 (6am to 7am)**

To achieve acoustic compliance during the night-shoulder period, the operation of the grinder, externally located screeners and shredders must not occur. Furthermore, the roller doors to the new wood waste processing building would need to be closed to contain noise within that building.

With the above controls included, the following noise levels are calculated for each of the identified surrounding residential receivers.

**Table 20: Scenario 2 Receiver Levels,  $L_{Aeq}$  15-minutes, dB**

Receiver	Noise Objective	Predicted Noise Level	Assessment Result
R1: 196 myall Way	38	38	Complies
R2: 124 Pindimar Road	38	30	Complies
R3: 87 Pindimar Road	38	35	Complies
R4: 27 Pindimar Road	38	38	Complies

### **Receiver Levels – Scenario 3 (Sleep Disturbance)**

The maximum noise level assessment for site operations between 6 am and 7 am, presuming the above controls measures adopted during this period (ie. no use of screeners, shredders, or the grinder), considers only:

- Breakout noise from plant and equipment in the hay baling and storage shed,
- Breakout noise from plant and equipment in the packaging shed,
- Breakout noise from plant and equipment in the workshop,
- Breakout noise from plant and equipment in the wood waste processing shed,
- Truck air brakes when inside both the wood waste processing shed and packaging shed (Note: the model assumes that the air brakes activate when inside each shed and with the roller doors open – the wood waste processing shed roller doors would then need to close per earlier acoustic control recommendations for 6 am to 7 am operation),
- Silt trap pump noise,
- Loaders operating around the material storage bays and FOGO maturation bed, and
- Truck movements.



The truck air brakes are expected to have the greatest potential to generate maximum noise levels above the maximum trigger level. The sound power level of the truck air brakes is calculated to be  $L_{Amax}$  117 dB. The corresponding internal reverberant sound pressure level in both the packaging shed and wood waste processing shed becomes  $L_{Amax}$  95 dB and 97 dB respectively. These levels are well above the maximum levels generated by the internal plant and equipment and general operations.

The  $L_{Amax}$  sound power level from external sources such as the silt trap pump and truck movements have little influence on the maximum levels calculated at each receiver site. The adopted sound power levels in the model are  $L_{Amax}$  99 dB for the silt trap pump and 97 dB for the low-speed truck pass-by.

$L_{Amax}$  levels in the hay baling shed are currently unknown as the Ray Walsh acoustic report only presents  $L_{Aeq}$  noise levels. Koikas Acoustics has conservatively adopted an  $L_{Amax}$  sound power level that is 10 dB higher than the corresponding  $L_{Aeq}$  sound power level for internal work in the baling shed.

The forklift  $L_{Amax}$  level is approximately 8 dB above the  $L_{Aeq}$  level, and this correction is adopted in the model for the hay storage shed. Maximum levels from this area are negligible. Similarly, the workshop maximum noise levels, although well above the  $L_{Aeq}$  level (+13 dB), are still not significant at the residential receiver locations.

The maximum noise levels for each residential receiver are shown in **Table 21**.

**Table 21: Scenario 3 Receiver Levels,  $L_{AFmax}$ , dB**

Receiver	Noise Objective	Predicted Noise Level	Assessment Result
R1: 196 myall Way	38	38	Complies
R2: 124 Pindimar Road	38	30	Complies
R3: 87 Pindimar Road	38	35	Complies
R4: 27 Pindimar Road	38	38	Complies

## 8.2.5 Mitigation and Management

The following recommendations are provided as a result of the assessment of noise emission from the ANL Tea Gardens facility under the current proposal:

- The high-speed grinder and low-speed shredder are to be located within the new wood waste processing building,
- The high-speed grinder shall not be used at any time before 7 am,
- When the high-speed grinder is in use, the roller doors to the wood waste processing building must be closed to contain noise within the building,
- Between 6 am and 7 am, externally located screeners and/or shredders shall not be operated,
- Between 6 am and 7 am, roller doors in the wood waste processing shed are to be closed, and
- Roller doors to all other sheds and buildings may remain open if needed.

## 8.2.6 Conclusions

The proposal will not introduce additional on-site noise sources nor result in any additional vehicle traffic on-site or on-road. It simply relates to adding FOGO feedstock to the existing wood waste material the site currently handles. The overall site tonnage of 150,000tpa will not change, only the allocation will change to 50,000tpa FOGO and 100,000tpa wood waste.



Acoustic controls previously advised for the site under DA-9/2021 and that form part of that approval is retained for this assessment. No additional controls are required to retain acoustic compliance under the current proposal.

## 8.3 ODOUR AND DUST

### 8.3.1 Introduction

An air quality and odour impact assessment (AQOIA) (included in **Appendix I**) has been prepared by The Odour Unit (TOU) to satisfy the SEARs, which requested the following is addressed:

***Air quality – including:***

- *A description of all potential sources of air and odour emissions during construction and operation*
- *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.*

### 8.3.2 Existing Environment

The Tea Gardens Facility is currently approved to accept and process 150,000 tpa of forestry residues, urban wood residues, and non-putrescible organics. It is proposed that this approved wood processing building is repurposed and retrofitted to operate the FOGO composting operations within this building. The proposed FOGO processing operations will not extend outside of the existing approved disturbance footprint and will be fully contained within Lot 1 DP714149. A series of layout drawings for the existing approved wood processing building at the Tea Gardens Facility is shown in the AQOIA as Figure 2.2, Figure 2.3, Figure 2.4, and Figure 2.5.

Based on the existing environment, the relevant air contaminants for the proposed FOGO processing operations are odour and dust to a significantly less extent.

### 8.3.3 Methodology

The AQOIA approach is based on an air quality and odour operational review in the context of the impact risk potential of the existing and the proposed transition to FOGO at the Tea Gardens Facility. The AQOIA consisted of identifying and characterising the manner in which FOGO will be received, managed, and processed to provide a site-specific analysis of the associated air quality and odour impact risks. By understanding the air quality and odour impact risks of the existing and proposed activities, all reasonable and practicable steps to eliminate or minimise those risks have been identified and characterised.

Where applicable, the AQOIA has adopted the relevant guidance provided in the following documents as published by the New South Wales Environment Protection Authority (NSW EPA) and the Department of Planning and Environment (DPE):

- *NSW EPA document titled Technical Framework (and notes): Assessment and management of odour from stationary sources. Sydney: Department of Environment and Conservation dated 2006 (NSW EPA Technical F & N).*
- *Department of Environment and Conservation (NSW) - Environmental Guidelines – Composting and related organics processing facilities dated 2004 (the Composting Guidelines).*

The AQOIA is based on a risk-based assessment approach that seeks to minimise the future air quality impact and odour nuisance from the proposed FOGO transition rather than compliance with a defined standard or criteria, given that the Tea Gardens Facility is seeking to repurpose its existing landscape supply and wood chipping facility. As such, the AQOIA outlines all reasonable and practical measures to mitigate future air quality and odour risks from the Tea Gardens Facility for the proposed FOGO processing modification. This



approach is consistent with the *NSW EPA Technical F & N objectives* and *Section 129 of the Protection of the Environment Operations Act 1997*.

### **8.3.4 Impact Assessment**

#### **8.3.4.1 Proposed FOGO Composting Air Emissions Control Protocol**

The operational management protocol for the proposed FOGO processing at the Tea Gardens Facility is based on the following components:

- The operations and how the production and migration of odorous compounds will be managed and minimised,
- The monitoring and control protocols that will be employed to assist in the management of odour,
- Design information for the future odour control system (OCS), and
- High-level details on the management and monitoring procedures for the OCS to ensure that it is operated effectively.

#### **Fogo Receival Processing Pathways**

The proposed FOGO processing operations will be designed for the receival, processing, and composting of feedstock within two (2) key areas, as follows:

- FOGO waste will be received, stored, and processed within two (2) hours of receipt and placed onto the AeroSorb® Aeration Composting System within the existing approved wood processing building, or
- FOGO waste received and stored which is not able to be processed within two (2) hours of receipt will be held in a dedicated FOGO buffer storage area within the existing approved wood processing building for up to twenty-four (24) hours and processed thereafter onto the AeroSorb Aeration Composting System.

#### **FOGO Composting Process General Overview**

Composting is the biological decomposition of biodegradable solid waste under controlled predominantly aerobic conditions (i.e. in a free oxygen favourable environment) to a state that is sufficiently stable for nuisance-free storage and handling and is satisfactorily matured for safe use in agriculture. The process is facilitated by a diverse range of micro-organisms, including bacteria, yeasts, fungi and actinomycetes living in aerobic conditions and is dependent on a number of factors, including.

- Waste type
- Carbon availability
- Carbon-to-nitrogen (C: N) ratio
- Temperature
- Aeration rate
- Pile size
- Moisture content
- pH
- Percent and type of bulking material utilised.

All the above factors, alone or combined, can have a significant impact on the composting process, odour emission generation potential, and final compost product quality. Stabilisation process optimisation to prevent the generation of malodours is the preferred approach. An optimised composting process typically involves fully aerobic conditions, optimum C: N ratios, and minimal turning of the stockpiles. However, it is acknowledged that composting facilities can have alternative optimisation strategies in place. Ultimately, the



experience of the Tea Gardens Facility will play a key role in the success of the composting process and the quality of the end product. This will be critical as part of the initial composting process within the 14-to-28-day processing period (completed in the existing approved wood building at the Tea Gardens Facility, refer to Proposed FOGO Processing Modification Overview section below for details).

### **Proposed FOGO Processing Modification Overview**

The existing approved wood waste building is to be repurposed and utilised for the receipt and composting of FOGO. This is a rural building measuring 45 m x 76 m x 8.5 m, which will continue to be used for the purpose of processing wood waste, including non-putrescible vegetative waste from agricultural, silviculture or horticulture. These types of wastes are defined in the Composting Guidelines, namely *Categorisation of Organics – Category 1*.

While the Composting Guidelines permit the processing of these organics external to a building, TOU understands that the proposed FOGO processing will fully enclose the initial FOGO composting phase at the Tea Gardens Facility. The primary driver for this is to enhance the ability to utilise more process leachate and stormwater in the operations.

The existing approved wood waste building will be repurposed to be capable of receiving up to 50,000 tpa of FOGO. This material will be shredded in a slow-speed shredder and placed onto ANL's proprietary Aero-Sorb aerated floor system platform (the Aero-Sorb Platform), where the initial composting will occur over 14 to 28-day days. The shredded composting material will be turned on the Aero-Sorb Platform three (3) times in the initial composting phase, achieving pasteurisation prior to removal from the existing approved wood waste building where it will be added to the existing composting system and undergo further composting, particle size reduction, blending and screening.

ANL has used the Aero-Sorb Platform technology at several of its facilities. For the proposed installation at the Tea Gardens Facility, the existing approved wood waste building will be placed on an aerated-floor slab where it will be aerated by a series of underfloor aeration pipes, fed by two (2) aeration fans. The system will vent air through the surface of the material into the air space within the existing approved wood waste building. As such, given that the entire air space will be ventilated to the external biofilter-based OCS, fugitive odour and dust emission releases from the existing approved wood waste building will be controlled and adequately mitigated to the extent that off-site impact will be very unlikely.

### **Odour Control System Concept**

The existing approved wood waste building at the Tea Gardens Facility will utilise a purpose-built biofilter-based OCS that will treat all significant odour emissions generated from within this building. The OCS design specification has been developed by TOU and will consist of the following key components:

- An extraction fan to deliver air to the biofilter,
- A roof-mounted air extraction system,
- A biofilter system immediately adjacent to the FOGO buffer storage building will have an empty bed residence time (EBRT) of at least 48 seconds,
- Maintaining negative pressure within the FOGO buffer storage building with the doors closed,
- Interlocking high-speed roller doors to prevent both doors from opening at the same time, and
- Moisture control of the biofilter bed material.

A high-level concept design of the OCS is shown in Figure 2.3 of the AQOIA. Based on the details in Figure 2.2 of the AQOIA, the OCS will be designed to achieve an air exchange rate of approximately (4) air changes per hour, sufficient to achieve measurable negative pressure conditions, with all access doors closed. This approach represents industry best-practice for odour control for enclosed composting operations in Australia. The ventilation air (approximately 112,000 m<sup>3</sup>/hr) will be treated through the biofilter system. The building will be fitted with high-speed roller doors on each truck doorway to ensure minimal escape of fugitive odour emissions during truck entry and exit.



The collected airstream will be humidified prior to biofiltration. Humidification of the air is required to ensure sustainable biofilter performance. Poor humidification results in uneven and potentially dry patches in the biofilter medium, and incomplete odour removal. Humidification will be achieved through the inclusion of an in-duct ultrasonic water spray system. The biofilter system has been proven to be an effective OCS across a wide range of industries both in Australia and overseas.

The biofilter is protected from heavy rain events by the inclusion of a roof covering the biofilter media. The roof will further house solar panels that provide power to the Tea Gardens Facility. The biofilter fan, located adjacent to the biofilter in the fan room, will draw air from a stainless-steel main duct and direct the combined airstream to the biofilter.

### **Biofilter Fan Specifications**

The biofilter fan specifications for the OCS, that will be augmented to the existing approved wood waste building, as part of the FOGO processing at the Tea Gardens Facility, will be as follows:

- Fan Type: Centrifugal,
- Materials: All wetted parts in 304 stainless-steel,
- Capacity: 112,000 m<sup>3</sup>/hr,
- Pressure Duty: 3.0 kPa, and
- Speed Control: Variable speed drive (VSD).

The actual initial airflows will be restricted to 112,000 m<sup>3</sup>/hr at the expected initial low biofilter back-pressure (less than 0.5 kPa) by the use of the VSD. Suction pressure losses into the fan are expected to be in the range of 0.7-1.0 kPa. The VSD will ensure that full design airflows can be achieved right up to the end of the life of the biofilter medium when the biofilter back-pressure can increase to 2.0 kPa. It will also result in power savings.

### **OCS Ducting**

The internal ducting system will consist of a simple header duct running the length of the building, under the ridge line. It will draw air preferentially from the headspace above the Aero-Sorb Platform. All ducting will be made of 304 stainless steels. The building will be fitted with inlet air louvres, sized to provide some resistance to inlet airflow such that negative pressure inside the building is achievable. These louvres will be located in optimum locations in the western and southern walls.

The biofilter location and initial layout are shown in Figure 2.3 of the AQOIA, which is based on TOU's design. The biofilter shape has been selected to suit the available area at the rear of the existing approved wood waste building. The design consists of multiple cells feeding off a longitudinal air distribution chamber. The proposed layout enables the biofilter fan and humidifier to be sited adjacent to the rear of the building, with sufficient access for maintenance and loading/replacement of the biofilter medium.

A 'hopper-front' biofilter design is proposed in which a sloping side of the biofilter medium has replaced the end wall of each conventional fully enclosed biofilter cell. This design has the benefit of allowing easy access to biofilter medium loading and replacement. It incorporates a sloping medium face that prevents any leakage of untreated air through the face. In all other respects, the proposed design incorporates the key design features of all TOU biofilters, including a full plenum floor air distribution system, a concrete air inlet distribution header duct/chamber, a free-draining robust medium, and pre-humidification of the entire foul air stream. TOU has successfully commissioned many biofilters with this design in Australia over the past two decades.

A total biofilter bed area of approximately 525m<sup>2</sup> is proposed for the biofilter, with a bed depth of 2.1 metres. While the layout depicted in Figure 2.3 of the AQOIA may differ from that selected during the final design, the total bed volume will remain unchanged.

The design airflow and the biofilter area and depth will result in conservative design loadings for biofilters operating within the composting industry. These loadings are also conservative by TOU standards and will ensure good sustainable performance at the Tea Gardens Facility.



The medium selected for the biofilter will be a proprietary TOU medium comprising predominantly of bark and shredded wood. The medium will be free-draining and have a relatively low-pressure drop of around 0.2 kilopascals (kPa) initially, rising to 2 kPa towards the end of its useful life. This low operating pressure, compared to other commonly used biofilter media, will result in lower energy consumption.

The biofilter will operate optimally at an air inlet maximum temperature of up to 40°C. Higher temperatures can be accommodated but will result in a shorter life of the biofilter medium. For this application high temperatures are not expected to occur, given that the primary composition of the inlet airstream to the biofilter system is ventilation air from the existing approved wood waste building.

### **Air Quality and Odour Analysis and Findings**

As documented above, the proposed FOGO composting operations at the Tea Gardens Facility will be conducted within a controlled building environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practices and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable.

The biofilter will be designed to remove the bulk, if not all, of the original odour character in the foul air stream. As such, the odour level in the treated air will mostly depend on the extent of the 'earthy/musty' odour picked up from the composting biofilter medium. TOU's experience is that a 'biofilter' odour is never problematical, even at these levels.

### **8.3.5 Mitigation and Recommendations**

Based on the operational evaluation analysis and findings documented in the AQOIA, the following remarks are made in the context of the proposed FOGO processing operations at the Tea Gardens Facility:

- The initial composting phase of the FOGO processing will be conducted in a controlled environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practices and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable,
- The AQOIA has considered the impact of transitioning to 50,000 tpa of FOGO and the existing approved wood waste building. Given that an OCS will be retrofitted to the existing approved wood waste building, the proposed infrastructure configuration and established waste management operations are adequate to effectively manage any future odour generation risk from the proposed FOGO operations,
- The proposed containment of the initial composting phase within the existing approved wood waste building and covering of the biofilter system is anticipated to result in further mitigating odour emissions through minimisation from ingress of rainfall on the maturation stockpile area, enhancing the management of moisture control during the initial FOGO composting period, and minimise surface water and leachate generation from the initial FOGO composting processing area,
- The proposed OCS to existing approved wood waste building for the initial composting phase is commensurate with the expected gradual rate of the transition to FOGO over several years. The building design allows for effective containment and ventilation adjustments to address potential organic shifts in the FOGO waste stream due to evolving regulatory, community, and social factors in the future. The biofilter-based OCS will be suitable for all FOGO and organic waste processing scenarios in the long term, and
- The full enclosure and capture of FOGO composting emissions in the initial phase offers a practical and reasonable pathway for a transition to FOGO that will maintain or possibly improve the amenity from an odour and dust emissions perspective compared to the existing operating conditions at the Tea Gardens Facility.



In addition to the above, the following recommendations are made as part of proactive and prudent measures for the management of odour and dust emissions from the Tea Gardens Facility under the proposed FOGO transition:

- Development of a Construction Environmental Management Plan (CEMP) for any construction and demolition works required as part of the proposed FOGO transition (where applicable). A CEMP outlines actions that should be implemented to prevent, control, and mitigate environmental and human impacts associated with any construction and demolition works. It also outlines protocols and policies for managing, monitoring, reporting, and responding to any potential environmental issues. As a minimum, the CEMP will need to consist of the reduction of airborne particles/dust emissions during construction and demolition works, dust suppression during dry weather, dust suppressants, windbreaks, covers, soil erosion, and other effective techniques to prevent and mitigate the generation and dispersion of dust as part of the proposed FOGO transition at the Tea Gardens Facility,
- Update the site-specific Air Quality & Odour Management Plan (AQOMP) to reflect the proposed FOGO transition at the Tea Gardens Facility. As a minimum, the updated AQOMP should document the hierarchy of controls in the form of, but not limited to, engineered, administration, and/or management practices, under the proposed FOGO transition, including:
  - Identification of critical air quality and odour emissions risk and control points,
  - An outline of how the production and migration of air pollutants (such as odour and dust) is minimised at the Tea Gardens Facility, including design (where applicable) and operational practices,
  - Standard operating procedures, equipment, material of construction, and management practices employed within the Tea Gardens Facility to anticipate the formation of odours and minimise their release,
  - An outline of the key staff and responsibilities with respect to air quality and odour management,
  - An outline of the reporting requirements with respect to air quality and odour,
  - The operation and maintenance of the biofilter-based OCS including the monitoring of humidity, pressure and temperature, and
  - An outline of future odour and dust strategies, as part of a long-term trigger action and response plan.
- Undertake a site-specific odour and dust validation assessment following the transition and commencement of FOGO processing at the Tea Gardens Facility. This will ensure the outcomes align with those documented in the AQOIA. This can be used as a basis for further mitigation and management measures and determine the activation of any future requirements for an update or change in the management practices and protocols adopted at the maturation pad under the proposed FOGO transition. The site-specific odour and dust validation assessment should include the following components:
  - Validation Phase 1 (Pre-FOGO): Conduct a baseline odour assessment pre-FOGO transition to characterise current operation condition,
  - Validation Phase 2 (Post-FOGO with OCS): Conduct an odour emissions control assessment with the Tea Gardens Facility operating with FOGO and the purpose-built OCS. Validation Phase 2 will also conduct a comparison of the outcomes from the previous validation phase as a basis to determine if further mitigation measures and controls are required,
  - All sampling and testing protocols adopted as part of Validation Phase 1 to Validation Phase 2 should consider all relevant standards and guidelines as follows:
    - NSW EPA titled *Approved methods for the sampling and analysis of air pollutants in NSW* dated January 2021,

- Australian Standard/New Zealand Standard 4323.3,
- Australian Standard/New Zealand Standard 4323.4, and
- Odour laboratory analysis at a NATA Accredited Laboratory.

### 8.3.6 Conclusions

Overall, a negligible or net improvement in odour and dust emissions is expected at the Tea Gardens Facility compared to the current operations. The transition to FOGO will not result in a change to the current licenced processing capacity at the Tea Gardens Facility and is not expected to result in an elevated odour and dust impact risk based on the assessed reduction measures adopted for the initial FOGO composting phase. The adoption of a fully enclosed and engineered environmental operating condition augmented with a purpose-built biofilter system for air emission treatment is reflective of best practice for the initial phase of FOGO composting in Australia. This is on the basis that the FOGO is processed within the existing approved wood waste building for a minimum period of 14 days and up to 28 days, based on processing conditions.

## 8.4 SOIL, WATER AND LEACHATE MANAGEMENT

### 8.4.1 Introduction

A soil, water and leachate assessment (included in **Appendix J**) has been prepared by Tattersall Lander Pty Ltd to satisfy the SEARs, which requested the following is addressed:

#### ***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.*

### 8.4.2 Existing Environment

#### 8.4.2.1 Geological

The Soil Landscapes of Port Stephens 1:100,000 indicates that two soil landscapes the Pindimar Road (pr) and the Nungra (ng) were present within the study area. The Pindimar Road (pr) soils cover the northern two-thirds of the study area including the operational area where the subject of this application is located and is “characterised by undulating to rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wootton Beds”.

Previous geotechnical reports conducted on the site also indicate that the existing soil subgrades are generally clay or silty clay overlying weathered sandstone and siltstone layers.

The eSPADE portal shows the soil type to be mapped as a Hydrologic Soil Group “C” – slow infiltration.



The site is not mapped as having any acid sulfate soil potential.

#### 8.4.2.2 Topographical/Catchments

A review of LIDAR and site survey data shows that levels across the site range from around 38m AHD at the highest points (in both the north and eastern extents of the site), to around 15m AHD at the lowest point (in the south-west corner of the site). Natural slopes vary and typically range between 1-12%, and the operational area has been modified to generally a maximum of 5% slope.

The Wood Waste Processing building will be situated within the footprint of the existing operations area and will generally utilise the existing drainage and treatment measures (with some supplementation).

The operations area contains three catchments directing flow towards three dams located within the site. The Wood Waste Processing building is located in Catchment 1. **Figure 14** illustrates the currently approved development and catchments within the site.



**Figure 14: Catchment Diagram**

All surface overflow within Catchment 1 will collect in Dam 1. Roof water from the Wood Waste Processing Building (FOGO Shed) and existing workshop building is directed into the three (3) existing 220kL rainwater tanks for internal re-use on site. Water is also reused directly from Dam 1 to meet various operational demands.

With regard to Catchment 3, the runoff from the concrete surface and hardstand is firstly directed to an existing silt trap before discharging to Dam 3 where it is stored. Any run-off from within Catchment 2 and overflow from Dam 3 will collect in Dam 2 located adjacent to the west. Water is pumped from Dam 2 to two (2) existing 220kL storage tanks and an existing 20kL storage tank from which water is reused onsite.

### 8.4.3 Water Sensitive Design Objectives

During the previous assessment of the site for DA9/2021, it was agreed with Council staff that application of Neutral or Beneficial Effect criteria was the most relevant standard to apply to the water quality assessment.

This application will not result in any external changes to the site; therefore, it will not change the volume or pollutant concentrations in any surface runoff. Furthermore, the predicted increased usage rates will improve treatment train performance by diverting more captured water back into reuse and further reducing any site discharges as confirmed by MUSIC modelling (Refer to **Section 8.4.4.4**).

## 8.4.4 Impact Assessment

### 8.4.4.1 Water Usage

The site currently operates under a scenario whereby no stormwater runoff from the development footprint leaves the site under normal site conditions - all runoff from the operations area is captured in storage ponds and tanks for reuse.

Run-off from developed areas is utilised on site for a range of purposes. With some of the site consisting of open gravel hardstand areas, water is required for dust suppression. Similarly, large amounts of processed material stockpiles are also exposed to the elements and are required to be wet down regularly to stop material from being blown away in the wind. A large amount of water is also required for wood waste processing. Any remaining run-off is used for irrigation purposes to ensure that no stormwater runoff will leave the site.

The estimated reuse rates for the proposal are presented below in **Table 22**. It is noted that the internal reuse provided in **Table 22** is based upon the average toilet demand of 55L/day/dwelling according to MidCoast Council Guidelines for *Water Sensitive Design Strategies (2019)* with the assumption the site will demand four times that of a standard residential dwelling. It is noted that this is negligible in comparison to the other uses on the site.

**Table 22: Water Reuse Estimates**

Reuse	Non-weather Dependant (modelled as daily demand) kL/day	Weather Dependant (modelled as annual demand distributed PET-rainfall) kL/day
50,000 tonne Shredder	106.16	-
Dust Control	-	29,700
Mulch Colouring	24.05	-
Landscape Irrigation	-	1,350
Potting Mix & Mulch Products	-	5,430
Existing Internal Reuse (toilet/shower)	0.22	-
<b>Total</b>	<b>130.43</b>	<b>36,480</b>



#### **8.4.4.2 Floodplain Management and Catchment Flooding**

The site is located at the top of the catchment, with no external runoff flowing into the operational area. Surface runoff from the site would make its way initially via first and second order streams through adjacent private rural properties to Station Creek, then on to Bundabah Creek and eventually into North Arm Cove (Port Stephens), approximately 2.6km downstream.

While there are no existing specific detailed flood assessments for these waterways, the most relevant Council flood study is the Port Stephens Design Flood Levels Climate Change Review. This study found the 2100 100yr flood level at Bundabah (North Arm Cove) to be 2.7m AHD. With site levels starting at 15m AHD, and the Wood Waste Processing building being at 31.8m AHD, it is not expected that there will be any impacts from local or regional flooding or downstream impacts on flooding as a result of this proposal.

#### **8.4.4.3 Integrated Water Cycle Management**

Due to its somewhat isolated location, the site currently operates without any connection to town water or sewer services.

The existing sewer service is a pump out arrangement, which is currently fit-for-purpose and will not be impacted by this application.

Water supply to both the existing and already approved buildings is via large capacity private tank water storage. Internal industrial processes on the site also utilise surface water runoff that is captured and stored in onsite dams. While this application will slightly increase reuse demand on these combined storage reserves, this is only an issue during extended dry periods where the facility actively monitors storage levels and manages operating capacity accordingly to avoid running out of supply.

#### **8.4.4.4 Stormwater Runoff Water Quality Management**

The quality of runoff generated by the site is important to ensure the preservation of the downstream environments. With a greater proportion of impervious surfaces, there's a corresponding rise in phosphorus and nitrogen levels in potential stormwater runoff.

It is important to note there is no exposed ponding of stormwater runoff (excluding the storage dams) on the site due to the impermeable concrete hardstand and adequate cross fall directing the stormwater runoff.

The aim of this study was to determine what measures need to be undertaken as part of this proposal to meet water quality objectives.

There are no proposed external changes as a result of this proposal and therefore no impact is anticipated on the quality or quantity of runoff. However, the proposal will marginally change water reuse rates on the site, the impact of this change has been assessed by modifying this value in the previously accepted MUSIC modelling that supported DA9/2021. The description below summarises the construct of this modelling.

##### **MUSIC Modelling**

MUSIC is the Model for Urban Stormwater Improvement Conceptualisation, developed by the Cooperative Research Centre for Catchment Hydrology. MUSIC provides the ability to model both quality and quantity of runoff generated by catchments. Therefore, MUSIC can simulate annual stormwater volumes, and expected annual pollutant loadings.

MUSIC is designed to model stormwater runoff systems in urban catchments. It is used to simulate a range of temporal and spatial scales. Catchment modelling can be performed for areas up to 100 km<sup>2</sup>, with time steps from 6 minutes to 24 hours to match the range of spatial scale. This enables long term modelling of continuous historical rainfall data from pluviograph sources and reflects the ability to account for temporal variation in data for an annual rainfall series directly.



MUSIC also has the ability to model a number of treatment devices and measure their effectiveness in terms of the quantity and quality of runoff downstream. This allows determination of the degree of reduction in annual pollutant loadings.

The MUSIC simulation relies heavily on input variables, but at small to medium scales of development, it is usually unfeasible to undertake a model calibration. In these cases, various publications have been produced to provide recommended model inputs, including NSW MUSIC Modelling Guidelines (BMT WBM, 2015) and Guidelines for Water Sensitive Design Strategies (MidCoast Council, 2019).

### **Climate / Rainfall**

To accurately model a site of this size, a continuous rainfall record spanning at least five years with a six-minute time step is required. Council have supplied a template for use across the LGA and the modelling in this report utilises the Council template.

The rainfall record in the template is ten years of data between the dates of 1/1/1969 and 31/12/1978. This data produced a mean annual rainfall of 1234mm. For comparison, it is noted that the long-term average rainfall (obtained from the Bureau of Meteorology) for Nelson Bay (approximately 11km from the site) is 1348mm.

### **Evaporation**

To accurately model the outcome of water quality treatment measures, potential evapotranspiration (PET) data is required. Again, this data has been taken from the MidCoast Council template which has a mean annual value of 1367mm.

For comparison, it is noted that monthly average areal potential evapotranspiration values from maps in the 'Climate Atlas of Australia, Evapotranspiration' (BoM, 2001) resulted in an annual average of 1335mm.

### **Node Parameters**

The MUSIC model was used to simulate the pollutant export generated during a ten-year period of average rainfall. Sandy clay loam soils are present at the site, and rainfall-runoff parameters for a "Group C" soil type were adopted from Table 4-2 of the MidCoast Council Guidelines for Water Sensitive Design Strategies (2019). A Rainfall Threshold of 5mm/day was applied to areas of the site covered by stockpiles. This is considered conservative, and the operators report that they would not usually witness runoff from these stockpile areas unless extended or exceptionally heavy rainfall is experienced onsite. A value of 0.5 mm/day was adopted for "Roof" nodes and 1.5mm/day was adopted for all other nodes.

Typical pollutant concentrations have been derived from the NSW MUSIC Modelling Guidelines (2015). As requested by the Council, the current version of this modelling has both unsealed and sealed road areas of the site modelled as an agricultural source node. Adopted rainfall runoff MUSIC parameters are shown below in **Figure 15** and **Table 23**.

Rainfall-Runoff Parameters	
Impervious Area Properties	
Rainfall Threshold (mm/day)	1.50
Pervious Area Properties	
Soil Storage Capacity (mm)	100
Initial Storage (% of Capacity)	25
Field Capacity (mm)	70
Infiltration Capacity Coefficient - a	180.0
Infiltration Capacity Exponent - b	3.00
Groundwater Properties	
Initial Depth (mm)	10
Daily Recharge Rate (%)	25.00
Daily Baseflow Rate (%)	25.00
Daily Deep Seepage Rate (%)	0.00

**Figure 15: Adopted Rainfall Runoff MUSIC Parameters**

**Table 23: Adopted MUSIC Pollutant Generation Parameters**

			Forest	Rural Residential	Agricultural (Sealed/Unsealed Road)	Roof
TSS	Baseflow (mg/L-log10)	Mean	0.78	1.15	1.30	-
		SD	0.13	0.17	0.13	-
	Stormflow (mg/L-log10)	Mean	1.60	1.95	2.15	1.30
		SD	0.20	0.32	0.31	0.32
TP	Baseflow (mg/L-log10)	Mean	-1.22	-1.22	-1.05	-
		SD	0.13	0.19	0.13	-
	Stormflow	Mean	-1.10	-0.66	-0.22	-0.89

			Forest	Rural Residential	Agricultural (Sealed/Unsealed Road)	Roof
	(mg/L-log10)	SD	0.22	0.25	0.30	0.25
TN	Baseflow (mg/L-log10)	Mean	-0.52	-0.05	0.04	-
		SD	0.13	0.12	0.13	-
	Stormflow (mg/L-log10)	Mean	-0.05	0.30	0.48	0.30
		SD	0.24	0.19	0.26	0.19

### Entire Catchment Flow Analysis

Site catchment areas have been broken up into different source nodes depending on their existing and future land uses, according to the NSW MUSIC Modelling Guidelines (2015). Gravel hardstand areas (unsealed roads) and concrete areas (sealed roads) have been modelled as Agricultural land use nodes, per previous Council direction. Landscaped areas and grassed open spaces are modelled as “Rural Residential”. Areas of the site that are heavily vegetated are modelled as “Forest”.

Following previous discussions with the Council, the site storage dams have been modelled as a “Pond” node within MUSIC, which allows permanent storage, infiltration losses and the onsite reuse to be modelled from a single node. Further, the Pond node assumes limited vegetation is provided in the dams, which is consistent with the existing site conditions.

Given the high usage rates required for site operations, additional water is stored in numerous storage tanks whenever it is available to ensure the security of supply to keep the plant operating. Water reuse onsite is actively managed and the operator draws down dam storage to fill numerous storage tanks and supply the site’s water demands.

Despite the large storage and reuse rates on the site, there will still occasionally be storm events large enough to cause dam overflows. It is an operational requirement of the site that a storage volume is available equal to the 10% AEP 24-hour storm.

Water is pumped to storage tanks and then to ‘waste’ on the site’s landscaped areas if levels are getting too high, particularly in the lead up to forecast large rainfall events. These landscaped areas have been constructed as a series of swales and localised depressions that hold the water until it is absorbed/evaporated, ensuring no runoff escapes the area. To account for this additional draw-down, an additional reuse rate is equivalent to 15x15kl water tanker loads per day (x 5.5 days/week x 45 weeks/yr = 55687kl/yr). The 45 weeks/yr is an allowance to reflect that these arrangements are typically not enacted on the wettest 5 weeks of the year, and also over the nominal 2-week Christmas shutdown. Further, this reuse rate has been distributed as “PET -rainfall” reflecting the fact that disposal of excess water is less likely on higher rainfall days. It was agreed with the Council that this most accurately reflects the actual scenario on site.

Modelled pollutant loads for DA9/2021, and this proposal are shown in **Table 24** below.

**Table 24: Modelled Pollutant Loads**

Aspect	TSS	TP	TN	GP
Pre-Treatment (kg/yr)	15,800	65.9	363	2,630
Post Treatment (kg/yr)	577	3.88	50.9	0
Reduction Achieved (%)	96.3	94.1	86.0	100
NorBE Target	1040	5.81	62.8	0
Target Met	Yes	Yes	Yes	Yes

#### 8.4.4.5 Site Water Balance

A water balance for the site and the impacts of the proposal can be generally summarised with the following components:

- Direct rainfall onto the site – no external catchments flow into the site operations area,
- Evaporation from the site, including from open water storage dams, silt traps and the wetland area,
- Site operations usage demand, and
- Diversion of roof water tank overflows – per NSW EPA advice, DA9/2021 directed that rainwater tank overflows be diverted around the site storage dams to discharge directly from the site.

It is noted that the site design also includes firefighting storage tanks. These tanks will be filled and retained as permanent emergency storage. They are not expected to be drawn upon other than in a fire emergency, and so will not contribute to the site water balance model.

#### Dam Storage Volumes

An assessment of storage dam capacities and their adequacy was undertaken for DA9/2021 with reference to the *Environmental Guidelines: Composting and Related Organics Processing Facilities* (DEC, 2004).

The guideline requires both Dam 1 and Dam 2 / 3 to have sufficient storage volumes to capture and store a 1-in-10 year, 24 hour period storm event without overflowing. Current Intensity-Frequency-Duration (IFD) data was sourced from the Bureau of Meteorology, which showed the 10% AEP 24hr duration rainfall depth to be 179mm.

**Table 25** below summarises the required storage volumes calculated using the Rational Method. Technically, this required storage volume could be made available through any combination of the available storage onsite - sediment forebays, the constructed wetland, rainwater tanks and the dams themselves.

**Table 25: Dam Storage Volumes**

Aspect	Dam 1	Dam 2/3
Total Catchment Area (ha)	4.80	7.70
Percentage Impervious (%)	81	74
Runoff Coefficient	0.84	0.80
Design Rainfall Depth (mm)	179	179
Required Storage Volume (cu.m)	7,220	11,030
Dam Volume Available (cu.m)	15,700	14,900

It's noted that no matter the capacity designed for a drainage or water retention system, there will inevitably be rainfall events exceeding the design standard, leading to controlled overflow situations. In this case, with the design storage capacity of the storage system being a 1-in-10 year 24 hour storm, controlled overflow would be expected in any 24 hour event with an Annual Exceedance Probability (AEP) greater than 1-in-10, and also many lower AEP events that may have a duration longer than 24 hours as the dams storages will not reset every 24 hours during an extended rain event.





To give an indication of the longer-term site water balances and the possible number and quantity of site discharges, the MUSIC model has been utilised to undertake a Water Balance Assessment.

MUSIC offers a continuous simulation approach using real world rainfall inputs over an extended period, to more realistically model long-term conditions (which include extended wet and dry periods). The conceptual hydrological model utilised in the MUSIC model is shown below as **Figure 16**.

The MUSIC model inputs include ten years of real-world rainfall data (in six-minute timesteps) and monthly average Potential Evapotranspiration data. These inputs have previously been provided by the MidCoast Council as the most appropriate data for use in the LGA. A time series plot of the model inputs is shown in **Figure 17** below.

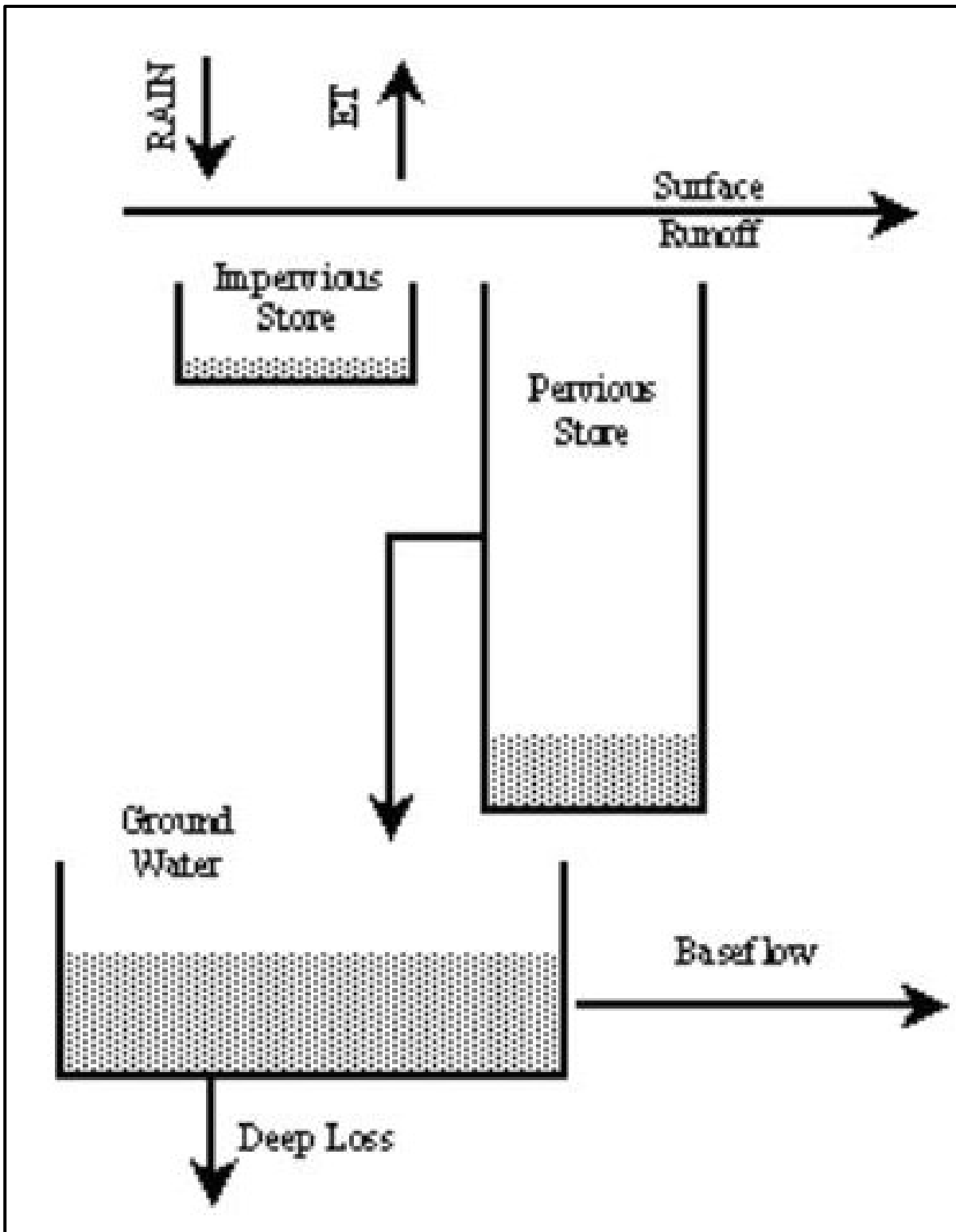
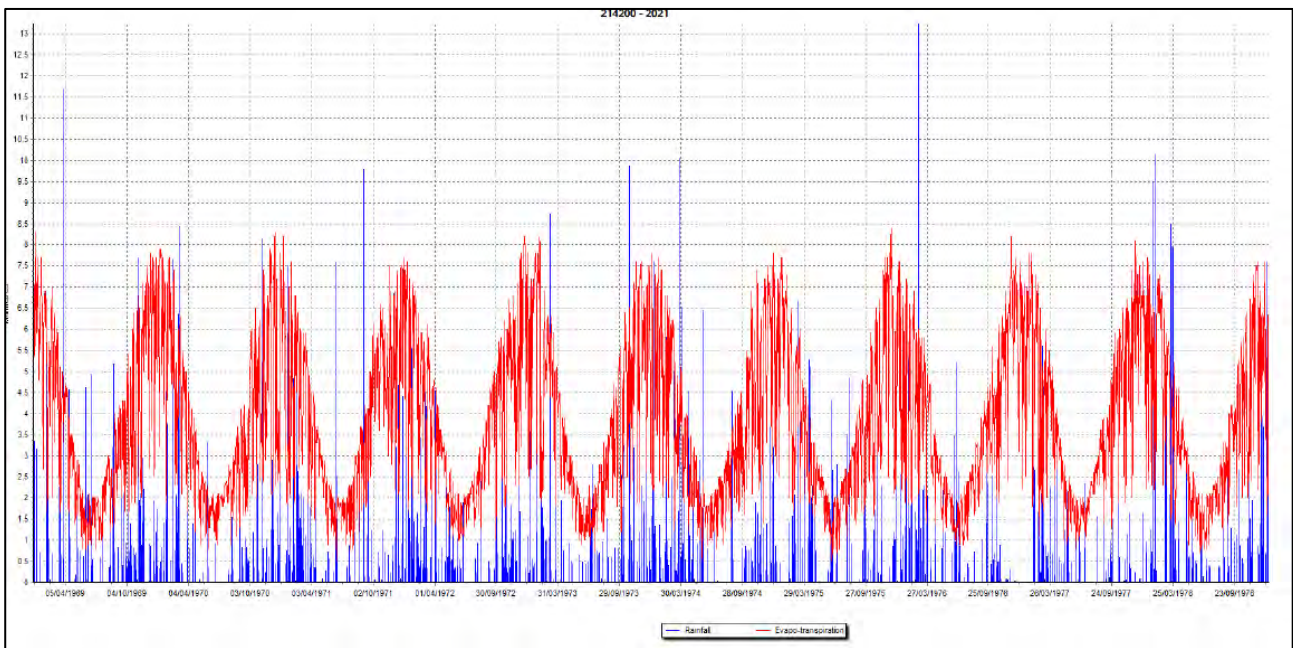


Figure 16: Conceptual Rainfall-Runoff Model adopted for MUSIC



**Figure 17: Rainfall and PET Model Inputs**

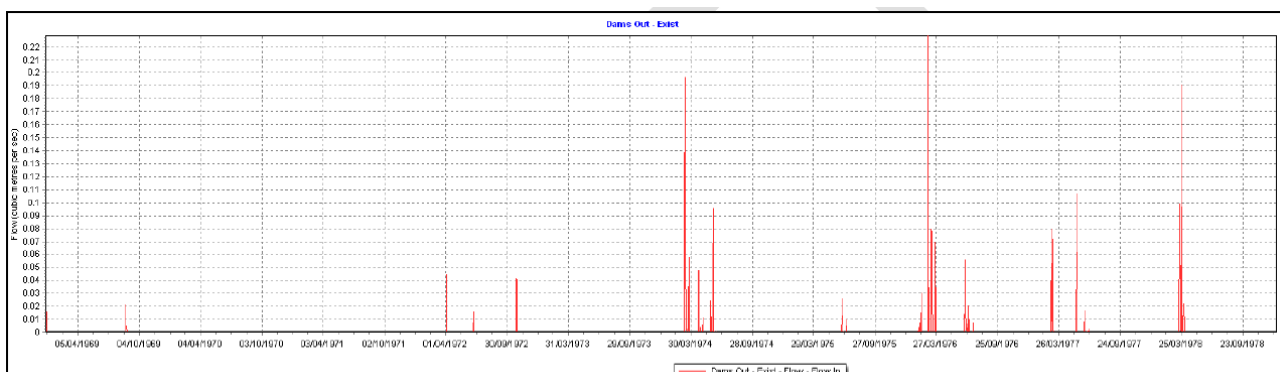
A full summary of the model setup is discussed in Section 9 of the water assessment, included in **Appendix J**.

With regards to infiltration rates, the MUSIC software does allow for modelling infiltration via what is known as a 'secondary linkage' with a 'Deep Seepage' outflow component. However, both the Council and NSW MUSIC modelling guidelines suggest that for the soil type present on this site, a deep seepage rate of zero should be adopted. The effect of this is that no water is lost from the model as seepage, but instead is modelled as baseflow. As this flow remains within the model and contributes to storage dam inputs, this is considered conservative for the purposes of this assessment. In any case, negligible infiltration would be expected given the highly impervious nature of the site.

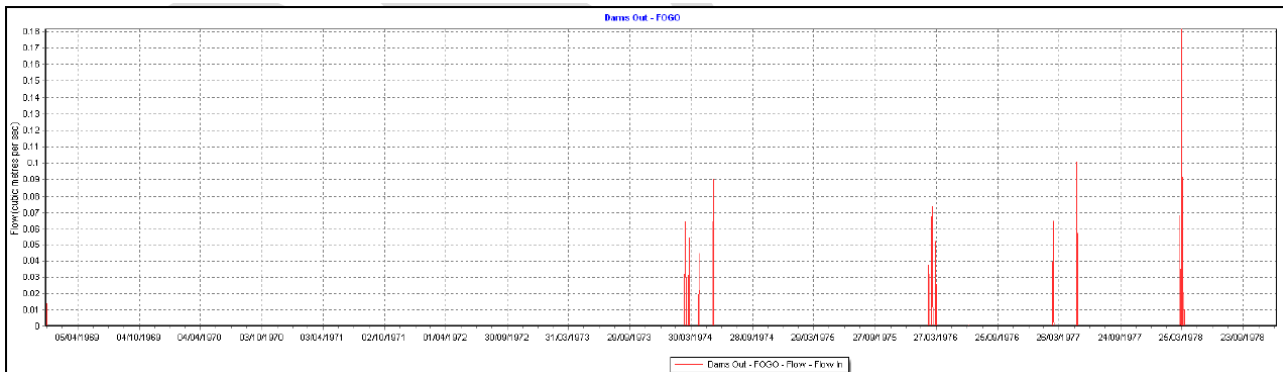
**Figure 18** and **Figure 19** below demonstrate that site discharges from the site storage dams will be reduced both in number and magnitude following site upgrade works and the inclusion of 50,000tpa of FOGO as an alternative feedstock.

Each of these simulated site discharges shown is a result of rainfall events greater in magnitude than the required design standards, and typically relate to extended wet periods (where there are multiple days of wet weather, and the storage dams are not able to be appropriately emptied again before the next rainfall input).

These events would generally coincide with local or regional flooding events. For example, analysis of the period between mid-January and mid-March 1976 indicates over 900mm of rainfall (four times greater than the long-term median value) and results in several days of site discharges.



**Figure 18: Existing Site Modelled Discharges**



**Figure 19: Proposed Site Modelled Discharges**

A Node Water Balance at the outlet node is summarised in **Table 26** below.

**Table 26: Outlet Node Water Balance**

Aspect	Current (Pre DA9/2021) site conditions	Existing Site Approvals	Proposed FOGO
Total Rainfall Inflow (ML/yr)	167.0	166.0	166.0
Surface Evapotranspiration Loss (ML/yr)	58.7	47.3	47.2
Total Baseflow (ML/yr)	7.5	4.9	4.9
Total Stormflow (ML/yr)	100.5	113.7	114.0
Change in Soil Storage (ML/yr)	0.3	0.2	0.2
Storage Evapotranspiration Loss (ML/yr)	13.5	15.7	15.4
Total Reuse (ML/yr)	64.9	79.9	80.6
Total Overflow (ML/yr)	30.9	25.4	25.4
Dam Overflows (ave. days/yr)	5.2	3.1	3.1

The modelling results are shown in **Table 26** and **Figure 13** and **Figure 19** show that while there will be some controlled discharges in certain rainfall events, both the number and size of these discharges will be reduced as a result of the increased storage volumes and reuse demands created by the DA9/2021 approval, and further nominal improvements as a result of the current FOGO application.

## 8.4.5 Mitigation and Conclusions

### 8.4.5.1 Sediment and Erosion Controls

A critical time for increased pollutant loads is during construction, and with this in mind, current practice recommends Managing Urban Stormwater, Landcom, 2004 (The "Blue Book") as the industry standard.



Erosion and sediment control measures should be designed and specified in accordance with the “Blue Book” guidelines, and to Council satisfaction, and be inspected and maintained during the construction phase. This will assist in ensuring adherence to pollutant prevention objectives, particularly the removal of suspended solids (sediment).

This application does not require any changes to the existing approved shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. This application only seeks to include 50,000tpa of FOGO as an alternative feedstock. However, the following evaluation was undertaken for erosion and sediment control as part of DA9/2021 which approved the construction of the shed.

As the construction footprint will be in excess of 2,500m<sup>2</sup>, typically it would be expected that a detailed Soil and Water Management Plan would need to be prepared for the construction stage prior to the release of the Construction Certificate. This would normally include calculations of likely soil loss during construction, instructions on preferred construction sequence and limiting land disturbance, and calculations for the provision and sizing of any temporary sedimentation basin to cover the period of civil works.

As a general comment on this site, the fact that the current proposal is within the existing development footprint will likely limit any significant risk of erosion and sedimentation issues. The site falls below the ‘A-Line’ in Figure 4.6 of The Blue Book and as such is classified as having a Low Erosion Hazard potential.

A RUSLE calculation has also been carried out as per the “Blue Book” (refer to Section 12.0 of the assessment for the calculation).

The resulting computed soil loss was calculated as 224m<sup>3</sup>/ha/yr, or 134m<sup>3</sup>/yr over the combined site disturbance area (0.6ha). This result is below the 150m<sup>3</sup>/yr trigger in The Blue Book:

- S6.3.2 (d) – *“Some small and/or flat sites might not warrant construction of a sediment basin.....the average annual soil loss from the total area of land disturbance can be estimated.....Where this is less than 150 cubic metres per year, the building of a sediment retention basin can be considered unnecessary”.*

As such, no construction sedimentation basins are specifically required during construction, and the erosion risk should be able to be adequately addressed with standard construction erosion control measures such as silt fencing and sandbagging. It is noted, however, that the existing silt traps and storage dams will operate as de facto sedimentation basins anyway, providing additional surety that construction sedimentation issues can be appropriately addressed.

#### 8.4.5.2 Monitoring Program

Any maintenance will be carried out by the proprietors of the processing plant. This will normally be limited to periodic cleaning of the water tanks and removal of excess sediment from the silt traps and dams (both periodically and after major storm events).

Constant monitoring of dam levels is undertaken to ensure that stored water is either utilised on site or dispersed around the site as required. This is particularly important in the leadup to forecast large rainfall events, to ensure that the minimum storage volume is available in a 1-in-10 year event.

Under current EPA Environmental Protection Licence requirements, the site operators keep daily observations and records, including:

- Rainfall
- Wind speed & direction
- Dam storage levels
- Onsite water usage

The water quality in site dams is also tested bi-annually for various water quality indicators, including:

- Chloride





- Nitrates
- pH
- Phosphate
- Sulphate
- Total Suspended Solids
- Potassium
- Sodium
- Lead
- Zinc

Monitoring and testing records are kept onsite, and also provided to the EPA as required by the current EPL. A sample of current records has been included in the Appendix of the soil, water and leachate assessment report (**Appendix J**).

#### 8.4.5.3 Conclusions

The site operates under an active management scenario whereby no runoff is permitted to leave the development footprint under normal operating conditions. Surface runoff is captured and stored for re-use onsite. The slight increases in internal water demand will result in a minor improvement to overall long-term site discharge conditions.

In addition, the current proposal is not impacted by local or regional flooding and will not have any impact on local or regional flooding.

## 8.5 ABORIGINAL HERITAGE

### 8.5.1 Introduction

Aboriginal due diligence for the proposed development has been undertaken by OzArk Environment & Heritage (OzArk) to satisfy the SEARs (refer to **Appendix K**) which requested the following be addressed:

***Heritage: Including Aboriginal and non-Aboriginal cultural heritage***

- *The EIS must include an assessment of Aboriginal and non-Aboriginal cultural heritage across the proposed development area and document these in the Aboriginal due diligence report.*

Section 57 of the National Parks and Wildlife Regulation 2019 requires a due diligence process to assess impacts on Aboriginal objects, providing a defence against harming them and fulfilling heritage obligations in NSW. Initially, determine if the proposed activity is a "low impact activity" with exemptions listed in Section 58. Since the proposal is not low impact, the due diligence process must be applied.

The process also involves assessing previous land-use disturbances. Section 58 defines disturbed land as visibly altered by human activities (e.g., construction, ploughing). While parts of the study area have been modified, some sections remain undisturbed. Thus, due diligence is necessary for the entire area. In summary, it is determined that the proposal must be assessed under the Due Diligence Code of Practice. The reasoning for this determination is set out in **Table 27**.

**Table 27: Determination of whether the Due Diligence Code of Practice applies**

Item	Reasoning	Answer
Is the activity to be assessed under Division 4.7 (state significant development) or Division 5.2 (state significant infrastructure) of the EP&A Act?	The proposal will be assessed under Part 4 of the EP&A Act.	No
Is the activity exempt from the NPW Act or NPW Regulation?	The proposal is not exempt under this Act or Regulation.	No
Do either or both apply: Is the activity in an Aboriginal place? Have previous investigations that meet the requirements of this Code identified Aboriginal objects?	The activity will not occur in an Aboriginal place. No previous investigations have been undertaken for this proposal.	No
Is the activity a low-impact one for which there is a defence in the NPW Regulation?	The proposal is not a low-impact activity for which there is a defence in the NPW Regulation.	No
Is the activity occurring entirely within areas that are assessed as 'disturbed lands'?	The proposal is not entirely within areas of high modification.	No
Due Diligence Code of Practice assessment is required		

## 8.5.2 Existing Environment

The subject site, situated at 12 Pindimar Road, Tea Gardens, NSW (Lot 1 DP714149), is approximately 5.5km southeast of the village of Tea Gardens, NSW. It falls within the jurisdiction of the Mid Coast Local Government Area (LGA) and is designated under land zoning RU2 – Rural Landscape. Surrounding areas are similarly zoned for rural use. The site spans approximately 42.47 ha in total area.

The project area is located on a site with a long history of development and works have been carried out on the site since 1932. Initial efforts involved planting 16,000 acres of *Pinus elliottii*, followed by the establishment of an on-site chip mill in 1979 to process these trees after a substantial bushfire. In 1988, the project area obtained approval for a wood-chipping plant operated by Boral Timber. The site was subsequently sold in 2014 to ANL, leading to the approval of a new development application for landscape material supplies, a packaging shed, a maintenance facility, a manager's residence, and associated works. In 2021, alterations and additions to existing operations were approved, including the incorporation of wood waste processing and ancillary works. The current proposed development relates to this building, which is designated for the processing of wood waste within an enclosed structure, as approved in 2021 as part of DA9/2021.

The project area currently has DA approval for a landscape supply and packaging complex, waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, aerated composting platform, site office, and manager residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

The study area for the due diligence and historic report of approximately 1.625ha is within the large project area as shown in **Figure 20**. There will be no additional ground disturbance to the study area or project area outside of what has been previously approved in DA9/2021. However, there will be a change in the use of the wood waste processing building planned for this area to facilitate the processing of mixed FOGO. All impacts will be within the approved DA area; however, a site inspection was undertaken to satisfy the SEARs requirements and as a precautionary measure by the proponent to ensure Aboriginal objects are not harmed.



**Figure 20: Project Area and Study Area**

Aboriginal people have occupied the Hunter Valley for at least 20,000 years (Koetigg 1987). The study area is located within the lands traditionally inhabited by the Worimi people, whose territory extended from north of the Hunter River to Forster, stretching along the coastline, encompassing Port Stephens and inland close to Gresford, and as far south as Maitland (Tindale 1974). The Worimi were hunter-gatherers and Sokoloffnov (1977) argues that the territories of the Worimi were established to include a variety of habitats rich in raw materials and food resources. Trade, intermarriage, and the sharing of ceremonial places were central to the Worimi nation's interaction with neighbouring tribal groups, such as the Awabakal, Kamilaroi, Gringai, Wanaruah, and other tribes in the region. The Worimi around the immediate Port Stephens area was traditionally divided into four groups or ngurras: the Malangal, Gamaipinal, Garuagal and Baraigal (Kelleher Nightingale 2023: 16). The study area is within the traditional lands of the Gumaipinal tribe – who inhabited the district on the north shore of Port Stephens and the Karuah River (W. Enright, Newcastle Morning Herald 14th November 1900). Early British accounts indicate that the Worimi lived a mobile lifestyle, primarily in small territorial clans and local clans of extended family groups, forming larger bands through social and cultural links including marriage and communal participation in subsistence activities.

Understanding the environmental context is crucial for interpreting Aboriginal sites. The local environment provided essential resources for past Aboriginal communities, including stone for crafting tools, food, and medicines, as well as wood and bark for various implements such as shields, spears, canoes, bowls, and shelters. Additionally, the landforms provided suitable areas for camping and other activities. The following sections provide details on each of the relevant environmental factors.

### 8.5.2.1 Geology and Soils

The study area is situated within the Pindimar Road (pr) and Nungra (ng) soil landscapes (Murphy, 1993) characterised by undulating to rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wootton Beds. The soils are moderately deep (30–70 cm) well-drained, Brown Podzolic



Soils. The Nungra Soil Landscape is located on gently inclined Footslopes and drainage plains of the Coweabah Hills. They consist of Quaternary alluvium and deep silty footslope deposits eroded from surrounding hills. Soils consist of poorly drained soliths.

#### 8.5.2.2 Topography and Hydrology

Elevation within the subject land ranges from approximately 30m Australian Height Datum (AHD) in the northeast to 20m AHD at the lowest point in the southwest, based on 10m contours. Natural slopes vary and typically range between 1-12%, and the operational area has been modified to generally a maximum of 5% slope. Distance from water is an important factor affecting the archaeological potential of an area. The closest named waterway to the study area is Station Creek, located approximately 1.7km to the west. There are three minor non-perennial waterways located to the north (80 m), west (133 m), and south (157 m) of the proposed development site, however, these systems are ephemeral and not conducive to long-term occupation.

Vegetation within the study area has undergone significant disruption, primarily concentrated in the water catchment runoff zone below the water tanks, a central section of the access track, and the steep incline to the northwest of the wood chip chute. Extensive disturbance is evident across the remainder of the proposed development area, characterised by a proliferation of weeds and low grasses covering gravel terrain.

Previous assessments and investigations in the region and surrounding landforms have established that grinding grooves, modified trees, artefact scatters, artefact sites, and potential archaeological deposits are the predominant site types likely to be encountered in the hinterland regions of Port Stephens. Although the landscape within the proposed development area may have featured such site types prior to 1788, the impact of historical disturbances has significantly diminished the likelihood of their continued presence.

#### 8.5.2.3 Synthesis of Environmental Context

The study area does not include environments that could be considered suitable for long-term occupation by traditional Aboriginal communities. The due diligence guidelines outline a series of landscape features that are known to be archaeologically sensitive and therefore are likely to contain Aboriginal objects. Included in this list is any land within 200m of 'waters' (DECCW 2010a). As the waterways near the project area are not considered 'waters', the study area does not qualify as an archaeologically sensitive area. Outcropping sandstone areas lie directly north of the woodchip chute; however, no evidence of grinding grooves or other cultural modifications was observed during the site inspection. The area did not contain old-growth native vegetation and no signs of culturally modified trees were recorded within the proposed development area.

### 8.5.3 Methodology

The due diligence report has been prepared in accordance with the Due Diligence Code of Practice for the protection of Aboriginal Objects in New South Wales (DECCW 2010: 10). The field inspection for the assessment was guided by the Guide to Investigating, Assessing, and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011).

The visual inspection of the study area was undertaken on 23 February 2024 by OzArk Heritage Consultant, Dr Bernadette Drabsch, with Shane Ping and Ray Feeney representing the Karuah Local Aboriginal Land Council. The inspection focused on areas subject to lower levels of disturbance. No Aboriginal objects or areas with the potential to contain subsurface deposits were identified.

The preparation of the Aboriginal due diligence and historic heritage assessment has followed these steps according to the Due Diligence Code:

**Step 1** - Will the activity disturb the ground surface or any culturally modified trees?

**Step 2a** - Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?



**Step 2b** - Are there any other sources of information of which a person is already aware?

**Step 2c** - Are there any landscape features that are likely to indicate the presence of Aboriginal objects?

**Step 3** - Can harm to Aboriginal objects or disturbance of archaeologically sensitive landscape features be avoided?

**Step 4** - Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

The following methodology has been applied to the preparation of the Due Diligence.

### 8.5.3.1 AHIMS Search

A search was undertaken of the Aboriginal Heritage Information Management System (AHIMS) on 16 February 2024, covering an approximate 10 x 10 km centered on the study area with revealed 72 previously recorded registered Aboriginal sites. None of the previously recorded sites are in the proposed development area. The closest recorded site (an artefact and potential archaeological deposit) is located approximately 1.5km northwest of the proposed development area on the Myall Way intersection. A summary of AHIMS sites near the study area is provided in **Table 28**.

**Table 28: Site types and frequencies of AHIMS sites near the study area**

Site Type	Number	% Frequency
Midden	22	30.5
Shell	12	16.6
Artefact site (quantity unspecified)	10	13.8
Modified tree (carved or scarred)	7	9.7
Potential archaeological deposit (PAD)	6	8.3
Burial	3	4.1
Artefact scatter	2	2.7
Stone arrangement	2	2.7
Artefact & PAD	1	1.3
Isolated find	1	1.3
Grinding groove	1	1.3
Grinding groove & PAD	1	1.3
Shell & PAD	1	1.3
Burial & Shell	1	1.3
Aboriginal resource and gathering, artefact & shell	1	1.3
Ceremonial ring (stone & earth) & modified tree	1	1.3
<b>Total</b>	<b>72</b>	<b>100%</b>

Searched co-ordinates Lat, Long from GDA Zone 56, Eastings: 408143–424810, Northings: 6381970–6398852

The most recorded sites are middens, which are generally located close to the shores of Port Stephens or the Myall Lakes waterways, suggesting extensive use of marine resources in this area. Artefact sites have been identified close to the inland creek systems and modified trees are located in areas of old-growth remnant forest along the shores of Port Stephens and close hinterland. Grinding grooves have been recorded in elevated areas containing sandstone, and stone arrangements and a ceremonial ring have been identified on





the headlands of North Arm Cove. Other site types in the local area include potential archaeological deposits, burials, an Aboriginal resource and gathering site, and isolated finds.

#### 8.5.3.2 Previous Archaeological Investigations Review

A review of previous archaeological work has been undertaken to inform the Aboriginal due diligence and historic heritage assessment. These included:

**Sullivan, M.E. 1982. *Aboriginal Shell Middens in the Coastal Landscape of NSW*. PhD thesis: Australian National University.**

- Beaches, rivers, and estuaries were important sources of food, particularly fish and shellfish
- The exploitation of estuaries was also commonly associated with exploitation of terrestrial resources
- Short-stay camps commonly occur along beaches and consist of a thin layer of shell (often pipi) and hearthstones
- Longer-stay camps are usually located on the margins of several environmental zones, e.g. near the edges of lagoons or estuaries with access to beaches or floodplains, and apart from shell and hearthstones these larger camps may also contain bone and flaked stone artefacts.

**Brayshaw, H. 1988. *Archaeological survey at Tea Gardens, NSW*. Report prepared for Condux Development Pty Ltd.**

Helen Brayshaw surveyed a large area immediately to the west of Tea Gardens in 1988. She traversed the entire location on foot, focusing on areas of ground surface exposure, mature trees, and environmental features that may have formed a focus for Aboriginal occupation. During the survey, Brayshaw located one site, a shell midden comprising four exposures within a 220 x 40 m strip along the bank of the Myall River opposite the southern part of Dredge Island (approximately 5 km southeast of the proposed development area). All the exposures occurred on sandy elevations vegetated by stands of Swamp Oak, ferns, and grasses. No stone artefacts or charcoal were identified at the site.

**Dean-Jones, P. 1990. *Newcastle Bight Aboriginal Sites Study*. Consultancy report to NSW National Parks and Wildlife Service and National Estate Grants Committee.**

In the late 1980s, Dean-Jones conducted a comprehensive and large-scale assessment to inform the region's future development planning, focusing on the Newcastle Bight (approximately 20 km southwest of the study area). The assessment area encompassed the whole of the Bight and included a review of previously recorded sites and relevant ethnographic data. A survey was undertaken as part of the assessment and recorded over 100 archaeological sites, with a further 40–50 middens noted in the modern foredune/swale but not recorded in detail. Midden sites predominated and stone artefacts were relatively rare. Denser concentrations of stone artefacts were associated with two particular types of sites: midden complexes associated with Late Holocene stable dune surfaces overlooking the deflation basin at the rear of the beach; and open campsites on Pleistocene dunes associated with Pleistocene freshwater wetlands of Holocene estuarine wetlands.

**Environmental Resources Management Australia. 2008. *Riverside at Tea Gardens, Aboriginal Heritage Assessment*. Report to Crighton Properties Pty Ltd.**

Environmental Resources Management Australia (ERM) was commissioned to prepare an environmental assessment for the proposed Riverside mixed-use development at Tea Gardens in 2008. Their study area of approximately 229 ha was predominantly flat and low-lying, with several beach ridges and creek lines, situated approximately 5 km east of the current study area. Most of their study area was cleared for a pine plantation in 1932 and featured a high percentage of disturbed land. One midden was recorded during the survey, located on a sand dune close to a wetland area. The midden is spread along the south-eastern edge of the sand dune ridge with commanding views of the Myall River.



**Biosis Pty Ltd. 2018. *Aboriginal Cultural Heritage Assessment Report: Karuah South Quarry.* Prepared for Wedgerock Pty Ltd**

In 2018 Biosis was commissioned to undertake an Aboriginal cultural heritage assessment for a proposed hard rock quarry in bushland 4 km northeast of Karuah, approximately 8 km southwest of the current proposed development area. Biosis conducted a survey of the 18ha study area in the company of three Registered Aboriginal Parties (RAPs) and no previously unrecorded sites were identified. However, the overall effectiveness of the survey was deemed low due to the vegetation cover restricting ground surface visibility at the time.

**Insite Heritage. 2021. *Aboriginal Cultural Heritage Assessment Report: Proposed Deep Creek Quarry, Limeburners Creek, NSW.* Prepared for Deep Creek Quarry.**

In 2020 Insite Heritage was commissioned to undertake an Aboriginal cultural heritage assessment for a Deep Creek Quarry, on the Bucketts Way, Limeburners Creek (approximately 20 km from the study area). They conducted a field survey over 2.5 days and no specific cultural heritage values were located within the proposed development area. Eleven (11) square metres of test pits were excavated and isolated finds were recorded in four of these. Artefact materials consisted of quartzite, pink silcrete, and fine-grained indurated mudstone/tuff. It was determined that the cultural significance of the site is moderate as an area containing evidence of visitation during resource gathering. The scientific significance was considered low, due to the low artefact density not displaying any complexity because of the peripheral occupation.

**Kelleher Nightingale Consulting Pty Ltd. 2023. *Stockton Dry Sand Extraction Project (SSD 52984213) Fullerton Cove, NSW: Aboriginal Cultural Heritage Assessment Report.* Prepared for Boral Resources (NSW) Pty Ltd.**

In 2021 Kelleher Nightingale Consulting undertook an Aboriginal archaeological and cultural heritage assessment for continuing operations at Boral's Stockton Dry Sand Extraction Project, located at Fullerton Cove. The survey covered areas where previous sand extraction had occurred and no archaeological sites, Aboriginal objects, or areas of Aboriginal archaeological potential were identified.

The archaeological studies presented above indicate that middens are likely to occur close to the beaches and swampy estuarine regions of Port Stephens. Within the coastal hinterland zones that are distant from permanent water sources, such as the project area, low density artefact sites have been located. It has been proposed (Insite Heritage 2021) that these areas were visited during resource gathering excursions and were not used for long-term occupation.

### **8.5.3.3 Site Visit**

In accordance with the Code of Practice, the aims of an archaeological survey are twofold. The first aim of an archaeological survey is to record all (or a representative sample of all) material traces of Aboriginal land use visible on the ground surface or as landscape features. The second aim is to assess subsurface archaeological potential. The Project area was initially inspected for the purposes of a due diligence assessment. This was followed by an archaeological survey conducted in accordance with the Code of Practice.

The study area was inspected on 23 February 2024 by OzArk Heritage Consultant, Dr. Bernadette Drabsch, with Shane Ping and Ray Feeney representing Karuah Local Aboriginal Land Council.

The survey was conducted on foot to ground-truth levels of disturbance unable to be distinguished at a desktop level and assess areas with increased archaeological potential. The mapping of survey units was undertaken on the basis of GPS recorded data and with reference to aerial and topographic information. The recording of sites was to be undertaken using representative digital photographs, GPS, and field notes which include observations of soils, ground surface exposure and visibility, vegetation cover, levels of ground surface disturbance, and similar observations.

Ground surface visibility was high in areas of disturbance and low within the vegetated areas. Areas of outcropping sandstone were visible immediately north of the woodchip chute; however, inspection found no

evidence of grinding grooves or other cultural modification. The vegetation within the study area did not contain old growth native vegetation, and no culturally modified trees were recorded. In conclusion, no Aboriginal cultural heritage sites were recorded during the visual inspection and due to the high levels of modification to the study area, it is considered that there are no areas with subsurface archaeological potential within the study area.

## 8.5.4 Results

The study area was approximately 1.65ha within the larger project area which is largely located where the land's surface has been modified in a clear and observable manner for the construction of a woodchip processing facility. However, some sections of the study area contain landforms that are not disturbed. No Aboriginal sites or objects were identified. No potential for subsurface archaeological potential was identified. No mature native trees and no culturally modified trees were identified.

Previous assessments indicated the likely presence of various Aboriginal sites in the study area, including grinding grooves and modified trees. However, no such sites were found during the site inspection. The absence of these features may be due to factors like the distance of sandstone outcrops from water sources and the removal of old-growth vegetation. Landform modifications from plantations and other uses could have also impacted potential archaeological deposits.

The due diligence process has resulted in the outcome that an Aboriginal Heritage Impact Permit (AHIP) is not required. The reasoning behind this determination is set out in **Table 29**.

**Table 29: Due Diligence Code of Practice application**

Step	Reasoning	Answer
Step 1 Will the activity disturb the ground surface or any culturally modified trees?	The proposed works will disturb the ground surface through the construction of the pre-approved wood processing facility and may impact culturally modified trees if present.	Yes
<b>If the answer to Step 1 is 'yes', proceed to Step 2</b>		
Step 2a Are there any relevant records of Aboriginal heritage on AHIMS to indicate the presence of Aboriginal objects?	AHIMS indicated that there are no Aboriginal sites within the study area.	No
Step 2b Are there other sources of information to indicate the presence of Aboriginal objects?	There are no other sources of information to indicate that Aboriginal objects are likely in the study area, although it is noted that there is a general likelihood for landforms in the region to contain Aboriginal objects.	No
Step 2c Will the activity impact landforms with archaeological sensitivity as defined by the Due Diligence Code?	No landforms with identified archaeological sensitivity are present within the study area.	No
<b>If the answer to any stage of Step 2 is 'yes', proceed to Step 3</b>		
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 proposal will not harm known Aboriginal objects or landforms with identified archaeological sensitivity. However, the proponent has elected to proceed to Step 4: a visual inspection.	Yes
<b>If the answer to Step 3 is 'no', a visual inspection is required. Proceed to Step 4.</b>		

Step	Reasoning	Answer
Step 4 Does the visual inspection confirm that there are Aboriginal objects or that they are likely?	The visual inspection recorded no Aboriginal objects in the study area. Landforms were found during the inspection to have low archaeological potential and the degree of modification in the study area precludes intact subsurface archaeological deposits.	No
<b>Conclusion</b>		
<b>AHIP is not necessary. Proceed with caution.</b>		

### 8.5.5 Impact Assessment

As the study area has been assessed as not having a likelihood of containing any Aboriginal objects, the proposed development would not harm Aboriginal objects. The proposed works are consequently assessed as having a negligible potential to impact Aboriginal heritage. To ensure the greatest possible protection of the area's Aboriginal cultural heritage values, the proposed work may proceed without further archaeological investigation under the following mitigation measures listed in **Section 8.5.6**.

### 8.5.6 Mitigation and Management

The following mitigation will be applied during the expansion of the development:

- All land and ground disturbance activities must be confined to the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed area, then further archaeological assessment may be required,
- This Assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* in accordance with *OEH guidelines should be followed*,
- All relevant staff should be made aware of their statutory obligations for heritage under the National Parks and Wildlife Act 1974 and the contents of the *Unanticipated Finds Protocol*,
- The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects, and
- It is assessed that it will be very unlikely that significant historic items will be discovered within the study area. However, if potentially significant items are discovered, the Historic Heritage Unanticipated Finds Protocol should be followed.

### 8.5.7 Conclusions

The Aboriginal due diligence and historic heritage assessment considered the environmental and heritage context of the study area. It has considered the Aboriginal heritage values of the study area and the impact of the proposed development on Aboriginal heritage values. It has been concluded that:

- AHIMS indicated that there are no Aboriginal sites within the study area,
- There are no other sources of information to indicate that Aboriginal objects are likely in the study area, although it is noted that there is a general likelihood for landforms in the region to contain Aboriginal objects,

- No landforms with identified archaeological sensitivity are present within the study area,
- The proposal will not harm known Aboriginal objects or landforms with identified archaeological sensitivity, and
- The visual inspection recorded no Aboriginal objects in the study area. Landforms were found during the inspection to have low archaeological potential and the degree of modification in the study area precludes intact subsurface archaeological deposits.

The full due diligence report is attached in **Appendix K**.

## 8.6 HISTORIC HERITAGE

### 8.6.1 Introduction

A historic heritage assessment has been prepared by OzArk Environment & Heritage for the proposed development to satisfy the SEARs as discussed in the **section 8.5.1**.

The Assessment will apply the Heritage Council Historical Archaeology Code of Practice (Heritage Council 2006) and the International Council on Monuments and Sites' The Burra Charter: The *Australia ICOMOS Charter for Places of Cultural Significance* (Burra Charter 2013) in the completion of a historical heritage assessment, including field investigations.

The historic heritage assessment is a combined report with the Aboriginal heritage due diligence assessment and is provided in **Appendix K**.

#### 8.6.1.1 Existing Environment

The study (shown in **Figure 20**) was inspected for historic heritage items at the same time as the Aboriginal field survey (refer to **Section 8.5.3.3**), no historic heritage items were recorded during the survey of the study area.

The study area, located at the intersection of Pindimar Road, holds historical significance within the broader context of Port Stephens City, a proposed development from the early 20th century. Despite this vision, the region's history dates back to Captain Cook's exploration in 1770, with subsequent considerations for settlement by Governor Macquarie in 1811. The area became known for cedar-getting in the early 1800s but plans for further development, including aspirations for capital status and a deep-water port, never happened.

### 8.6.2 Methodology

The following methodology has been undertaken for the historic heritage assessment.

#### 8.6.2.1 Desktop database searches

A desktop search was conducted on the following databases to identify any potential previously recorded heritage within the study area. The results of this search are summarised in **Table 30**.



**Table 30: Historic heritage desktop database search results**

Name of Database Searched	Date of Search	Type of Search	Comment
National and Commonwealth Heritage Listings	28/2/24	Mid Coast Council LGA	No places listed on either the National or Commonwealth heritage lists are located within or near the study area.
State Heritage Listings	28/2/24	Mid Coast Council LGA	There are no places on the State Heritage Listings located within or near the study area.
Local Environmental Plan (LEP)	28/2/24	Great Lakes LEP 2014	There are no places on the Great Lakes LEP 2014 located within or near the study area.

A search of the Heritage Council of NSW administered heritage databases and the Great Lakes LEP returned no records for historical heritage sites within the designated search areas. As such there will be no impact from the proposal on listed historic heritage items within the broader area.

#### 8.6.2.2 Site Survey

The following methodologies have been undertaken for the site survey within the study area:

- Standard archaeological field survey and recording methods were undertaken (Burke & Smith 2004), and
- The study area was assessed for historic heritage items at the same time as the Aboriginal field survey (refer to **Section 8.5.3.3**).

The study area contains infrastructure including a dam, water tanks, access tracks, a woodchip chute, and retaining walls. There were areas of dense vegetation within the seepage zone of the water tanks, within the central portion of the access track, and to the immediate north of the woodchip chute. All other areas were accessible during the survey and the items of infrastructure did not unduly affect the survey efficiency or the potential to identify historic heritage items.

#### 8.6.2.3 Results

The study area exhibits notable land modifications, including the presence of a dam, retaining wall, water tanks, and a woodchip chute, likely constructed around 1979 by Bunderbar Forest Products Limited (BFP) (Tomasy 2020: 6). No historical heritage items were identified during the survey of the study area. Therefore, the proposed project is not expected to impact significant historical heritage. The absence of historical heritage items within the study area is consistent with its history of use as a woodchip plant and extensive land modification associated with this industry.

#### 8.6.2.4 Impact Assessment

The impact of the proposed Project is assessed based on the information provided, the archaeological field observations, and the assessment of archaeological potential and significance. As the study area has been assessed as not having a likelihood of containing any historical heritage items, the proposed development would not harm heritage objects. Recommendations concerning the historical values within the study area are discussed in **Section 8.5.6**.

## 8.7 BIODIVERSITY

### 8.7.1 Introduction

Flora, fauna, and habitat assessments (the Ecological Assessment) were undertaken by Wildthing Environmental Consultants Pty Ltd for the previously approved extension of the ANL Facility (DA-9/2021). As this application does not require any additional disturbance to the previously approved disturbance footprint, no additional Ecological Assessment has been undertaken.

Results from the most recent Ecological Assessment are discussed further below. A copy of the report is presented in **Appendix L**.

The Ecological Assessment was undertaken in accordance with the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016), and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).

The Ecological Assessment satisfies the SEARS, which requested the following is addressed:

***Biodiversity – including:***

- *Accurate predictions of any vegetation clearing on site or for any road upgrades.*
- *A detailed assessment of the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, groundwater dependent ecosystems and any potential for offset requirements in accordance with the current Environment and Heritage Group legislation and guidelines.*
- *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/or offset biodiversity impacts.*

### 8.7.2 Existing Environment

The site is located within the NSW North Coast Bioregion and Karuah Manning Sub-bioregion. The site is also located within the Newcastle Coastal Ramp NSW Landscape and occurs in the Mid Coast Local Government Area (LGA).

With the exception of the existing footprint of the ANL operations, the surrounding area is undeveloped and covered in native vegetation consisting primarily of open forest. The invasive *Pinus elliotii* (Slash Pine) is common within parts of the study area.

### 8.7.3 Methodology

#### 8.7.3.1 Desktop Assessment

A site-specific literature and database review was undertaken prior to conducting a field survey and preparation of the Ecological Assessment report. A list of the resources reviewed, the date they were accessed, and the spatial extent of the search conducted are provided in Table 4.1 of the Ecological Assessment report.

#### 8.7.3.2 Field Assessment

Fieldwork was undertaken across the site between September 2019 and June 2020. A summary of the time spent on-site during fieldwork and the prevailing weather conditions at the time is included in **Table 31**.

**Table 31: Field Assessment Details**

Date	Time	Survey Effort (Person Hours)	Activity	Weather
05/09/2019	1130 - 1400	4.5	<ul style="list-style-type: none"> <li>General site inspection</li> <li>Threatened orchid searches</li> <li>Avifauna survey</li> <li>Vegetation survey</li> <li>Incidental observations</li> </ul>	0/8 Cloud, 22°C, 72% Relative humidity, Wind NE 15km/h
12/09/2019	1200 - 1430	2.5	<ul style="list-style-type: none"> <li>Threatened orchid searches</li> <li>Threatened flora searches</li> <li>Avifauna survey</li> <li>Incidental observations</li> </ul>	3/8 Cloud, 24.4°C, 14% Relative humidity, Wind NW 30km/h
09/10/2019	0800 - 1300	10.0 (Two persons)	<ul style="list-style-type: none"> <li>Threatened orchid searches</li> <li>Threatened flora searches (Tetratheca juncea)</li> <li>Avifauna survey</li> <li>Vegetation survey</li> <li>Incidental observations</li> </ul>	1/8 Cloud, 15°C, 53% Relative humidity, Wind SW 17km/h
16/12/2019	0730 - 1400	6.5	<ul style="list-style-type: none"> <li>Vegetation Survey</li> <li>Threatened Orchid Searches</li> <li>Diurnal fauna survey</li> <li>Incidental observations</li> </ul>	4/8 Cloud, 22°C, 74% Relative humidity, Wind S 31km/h
16/03/2020	1030 - 1530	10.0 (Two persons)	<ul style="list-style-type: none"> <li>Trap deployment</li> <li>First Camera Trap deployment</li> <li>Incidental observations</li> </ul>	4/8 Cloud, 21°C, 74% Relative humidity, Wind SE 26km/h
17/03/2020	0620 - 0745	1.4	<ul style="list-style-type: none"> <li>Checking traps</li> <li>Incidental observations</li> </ul>	3/8 Cloud, 15°C, 92% Relative humidity, Wind SE 19km/h
18/03/2020	0620 - 0730	1.2	<ul style="list-style-type: none"> <li>Checking traps</li> <li>Incidental observations</li> </ul>	2/8 Cloud, 13.5°C, 88% Relative humidity, Wind SW 2km/h
19/03/2020	0625 - 0740	1.25	<ul style="list-style-type: none"> <li>Checking traps</li> <li>Incidental observations</li> </ul>	0/8 Cloud, 14°C, 84% Relative humidity, Wind NW 7km/h

20/03/2020	0630 - 1000	7 (Two persons)	<ul style="list-style-type: none"> <li>• Checking and retrieval of traps</li> <li>• Anabat deployed near dam</li> <li>• Second Camera Trap deployed near dam</li> <li>• Incidental observations</li> </ul>	0/8 Cloud, 14.5°C, 94% Relative humidity, Wind NW 2km/h
24/03/2020	1915 - 1845	1.5	<ul style="list-style-type: none"> <li>• Amphibian Survey</li> <li>• Spotlighting</li> <li>• Bat Call Survey (Anabat)</li> </ul>	6/8 Cloud, 21°C, 70% Relative humidity, Wind N 26km/h
25/03/2020	0930 - 1030	1.0	<ul style="list-style-type: none"> <li>• Avifauna Survey</li> <li>• Reptile Survey</li> <li>• First Camera Trap retrieval</li> </ul>	1/8 Cloud, 20°C, 75% Relative humidity, Wind NW 6km/h
27/03/2020	1900 - 1830	1.5	<ul style="list-style-type: none"> <li>• Amphibian Survey</li> <li>• Spotlighting</li> <li>• Bat Call Survey (Anabat)</li> </ul>	4/8 Cloud, 24°C, 60% Relative humidity, Wind NE 11km/h
23/04/2020	1000 - 1200	2.0	<ul style="list-style-type: none"> <li>• Vegetation Survey</li> <li>• Avifauna Survey</li> <li>• Anabat Retrieval</li> <li>• Second Camera trap retrieval</li> </ul>	2/8 Cloud, 20°C, 55% Relative humidity, Wind NW 13km/h
10/06/2020	1430 - 1900	4.5	<ul style="list-style-type: none"> <li>• Vegetation Survey</li> <li>• Amphibian Survey</li> <li>• Stagwatch,</li> <li>• Spotlighting</li> <li>• Call Playback Survey and listening periods</li> </ul>	8/8 Cloud, 18°C, Calm, 85% Relative Humidity. Wind NE 16km/h. Rainy. No moon seen.
11/06/2020	1430 - 1900	4.5	<ul style="list-style-type: none"> <li>• Threatened flora searches</li> <li>• Amphibian Survey</li> <li>• Stagwatch,</li> <li>• Spotlighting</li> <li>• Call Playback Survey and listening periods</li> </ul>	1/8 Cloud, 17°C, Calm, 85% Relative Humidity. Wind SW 13km/h. No moon seen.
12/06/2020	1000 - 1400	4.0	<ul style="list-style-type: none"> <li>• Spot Assessment Technique</li> </ul>	6/8 Cloud, 16°C, Calm, 88% Relative Humidity. Wind NW 9km/h.

A detailed methodology for the surveys listed in **Table 31** are described in the Ecological Assessment report (**Appendix L**) for the following:

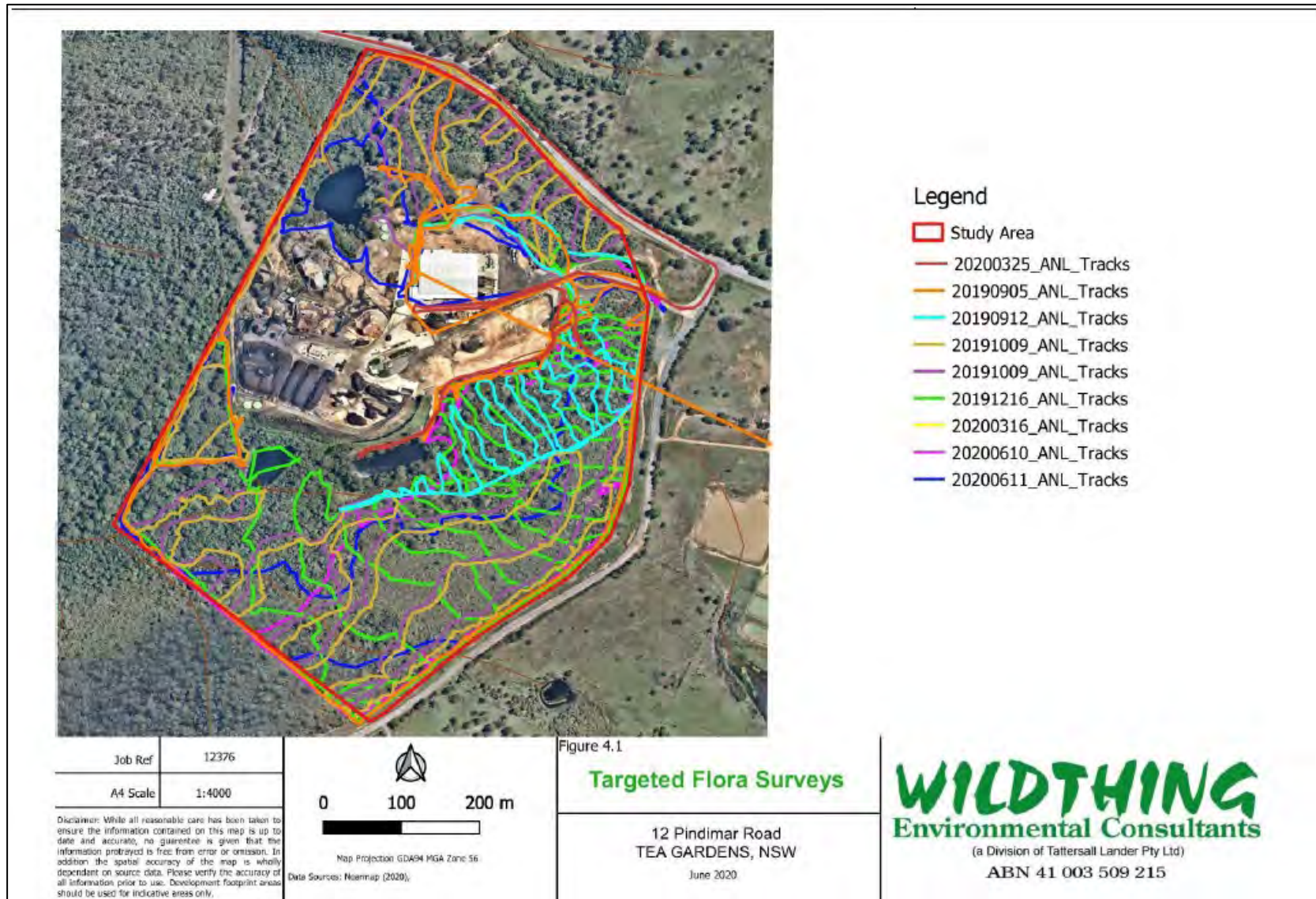
- Vegetation and Habitat Assessment
- Targeted Threatened Flora Surveys



- General Habitat for Native Species
- Habitat for Significant Species
- Hollow Bearing Tree Survey
- Terrestrial Fauna Assessment
- Small Terrestrial Mammal Trapping
- Medium Terrestrial Mammal Trapping
- Arboreal Terrestrial Mammal Trapping
- Microchiropteran Bat Call Survey
- Amphibian Survey
- Reptile Survey
- Diurnal Avifauna Survey
- Nocturnal Avifauna and Mammal Call Playback Survey
- Spotlighting Survey
- Spot Assessment Technique (SAT)
- Camera Trapping
- Significant Species

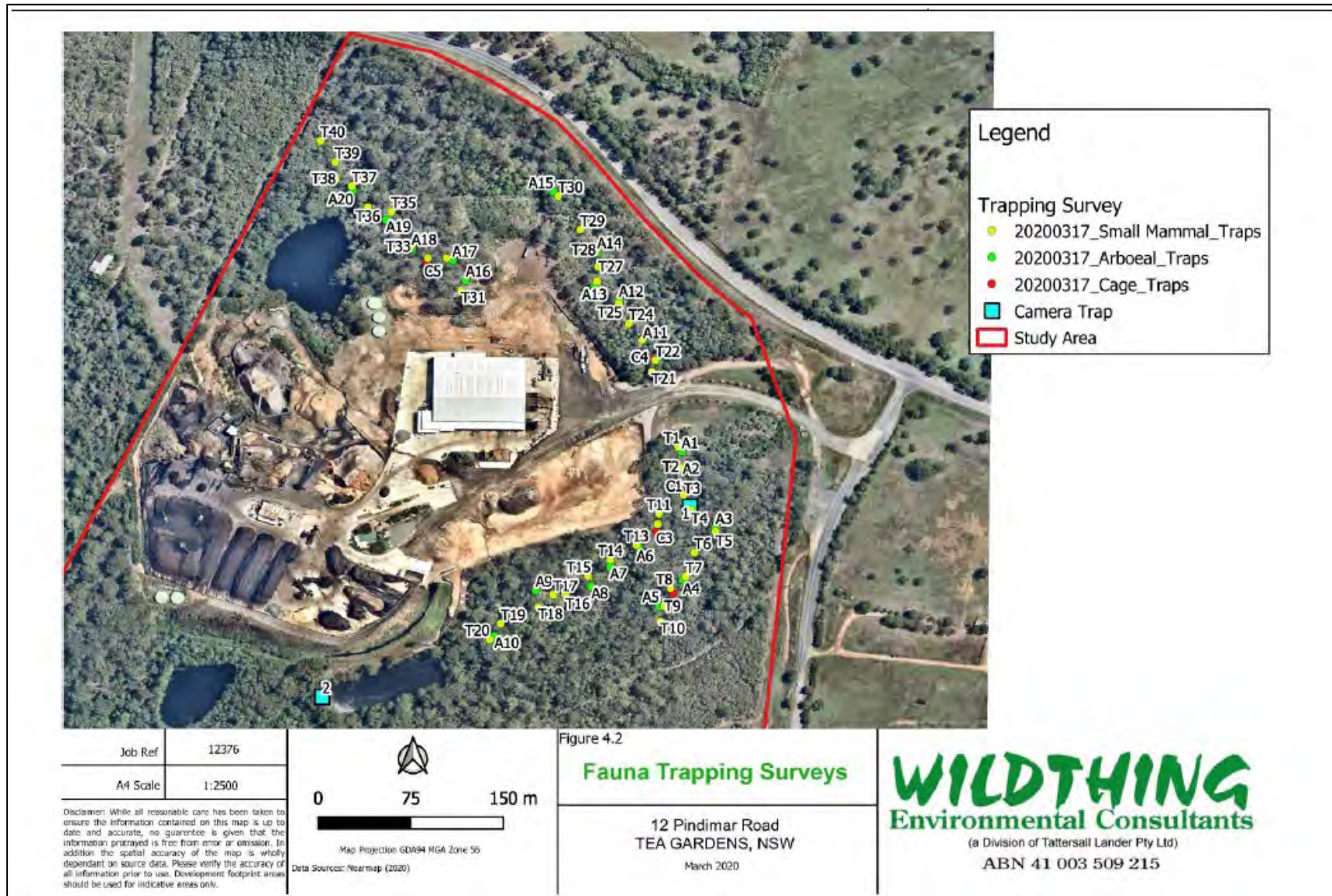
The locations of the flora and fauna surveys undertaken across the Project site are shown in **Figure 21**, **Figure 22** and **Figure 23** below.





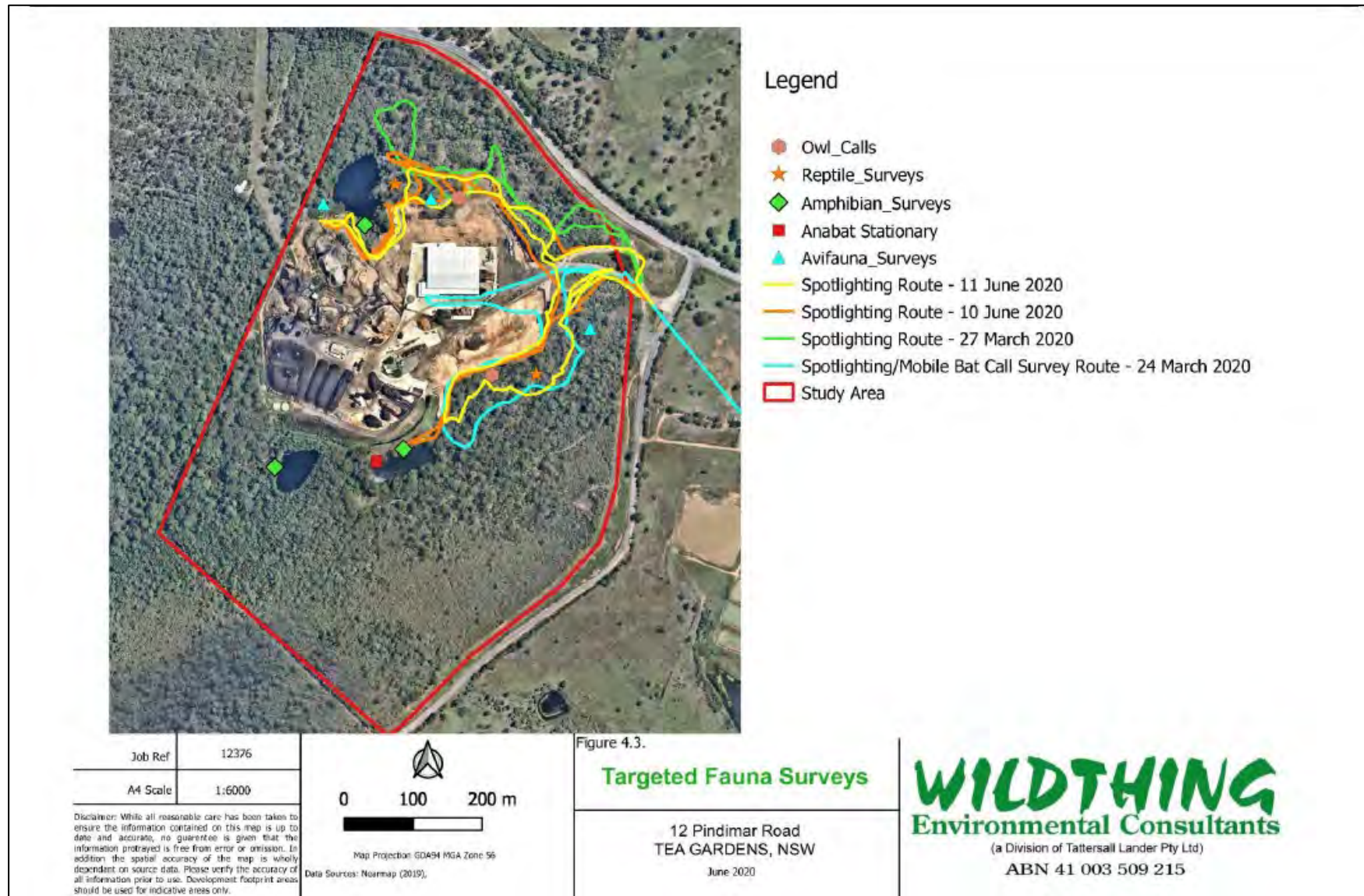
**Figure 21: Targeted Flora Survey Locations**





**Figure 22: Fauna Trapping Survey Locations**





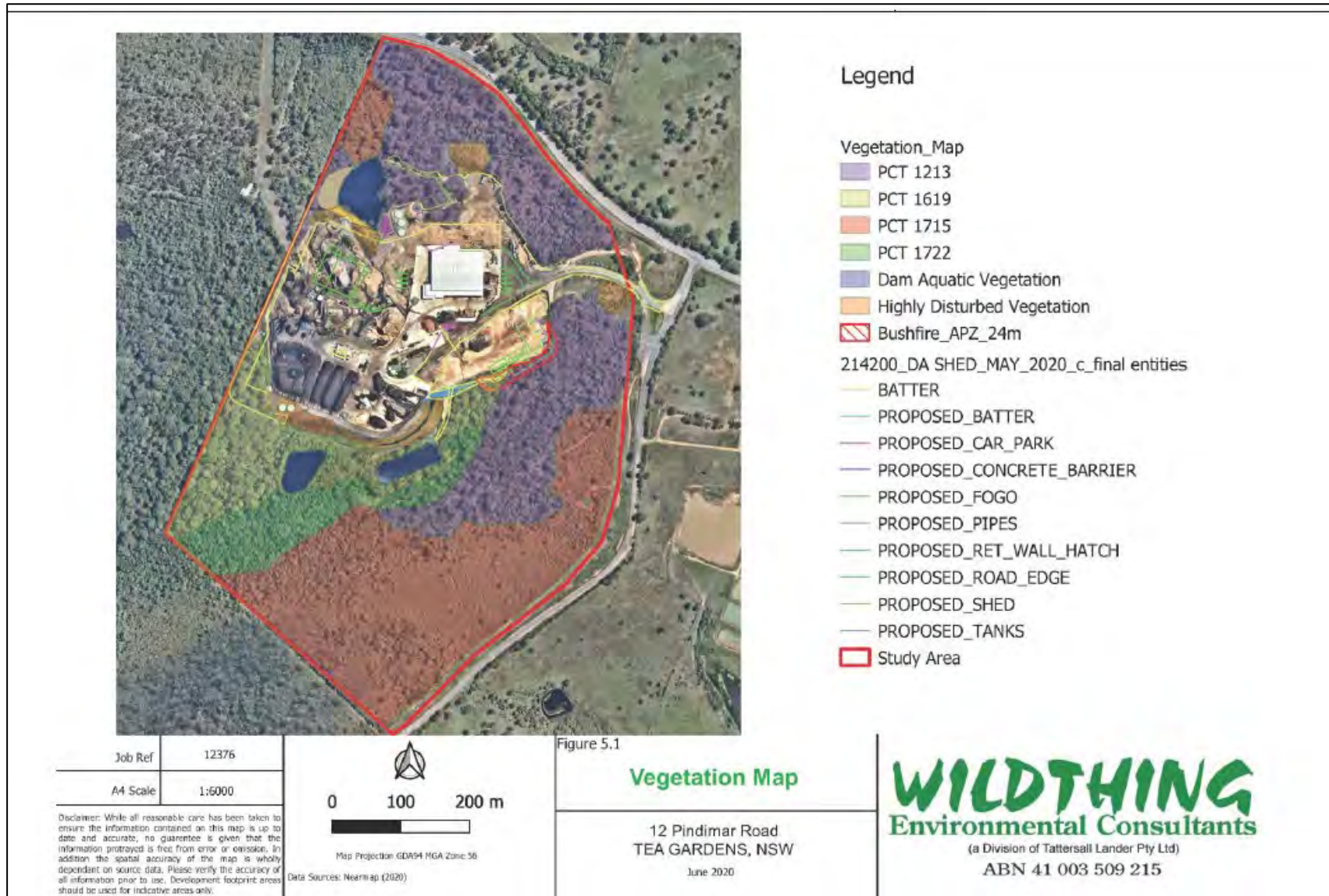
**Figure 23: Targeted Fauna Survey Locations**

## 8.7.4 Results

The vegetation of the subject site was stratified by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database, the following PCTs were present within the study area:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion,
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands,
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast,
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast,
- Highly Disturbed Vegetation, and
- Aquatic Dam Vegetation.

A comprehensive description of these assemblages present with the Project area are provided in Tables 5.1-5.5 of the Ecological Assessment report. The extent of vegetation within the Project area is shown on **Figure 24**.



**Figure 24: Vegetation Within Project Area**



### **Endangered and Vulnerable Ecological Communities**

Seven Endangered Ecological Communities (EEC) listed under the TSC Act 1995 are known to occur within the local area:

- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South-East Corner Bioregions,
- Littoral Rainforest in the NSW North Coast, Sydney Basin and South-East Corner Bioregions,
- River Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions,
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South-East Corner Bioregion,
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions,
- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South-East Corner bioregions, and
- Subtropical Coastal Floodplain Forest of the NSW North Coast, Sydney Basin and South-East Corner bioregions (SCFF).

Five threatened Ecological Communities listed under the EPBC Act 1999 are considered to have suitable habitat within the local area:

- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia,
- Lowland Rainforest of Subtropical Australia,
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South-East Queensland ecological community,
- *Posidonia australis* seagrass meadows of the Manning-Hawkesbury ecoregion, and
- Subtropical and Temperate Coastal Saltmarsh.

Approximately 2.6ha of the state listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South-East Corner Bioregions was present on the lower ground in the southern half of the study area. This TEC will not be directly impacted as a result of the proposal.

### **Endangered Populations**

The Emu population in the NSW North Coast Bioregion and Port Stephens LGA has been previously recorded within 10km of the site according to the BioNet database (DPIE, 2020). The proposal is unlikely to have a significant impact on this population such that a viable local population would be placed at risk of extinction.

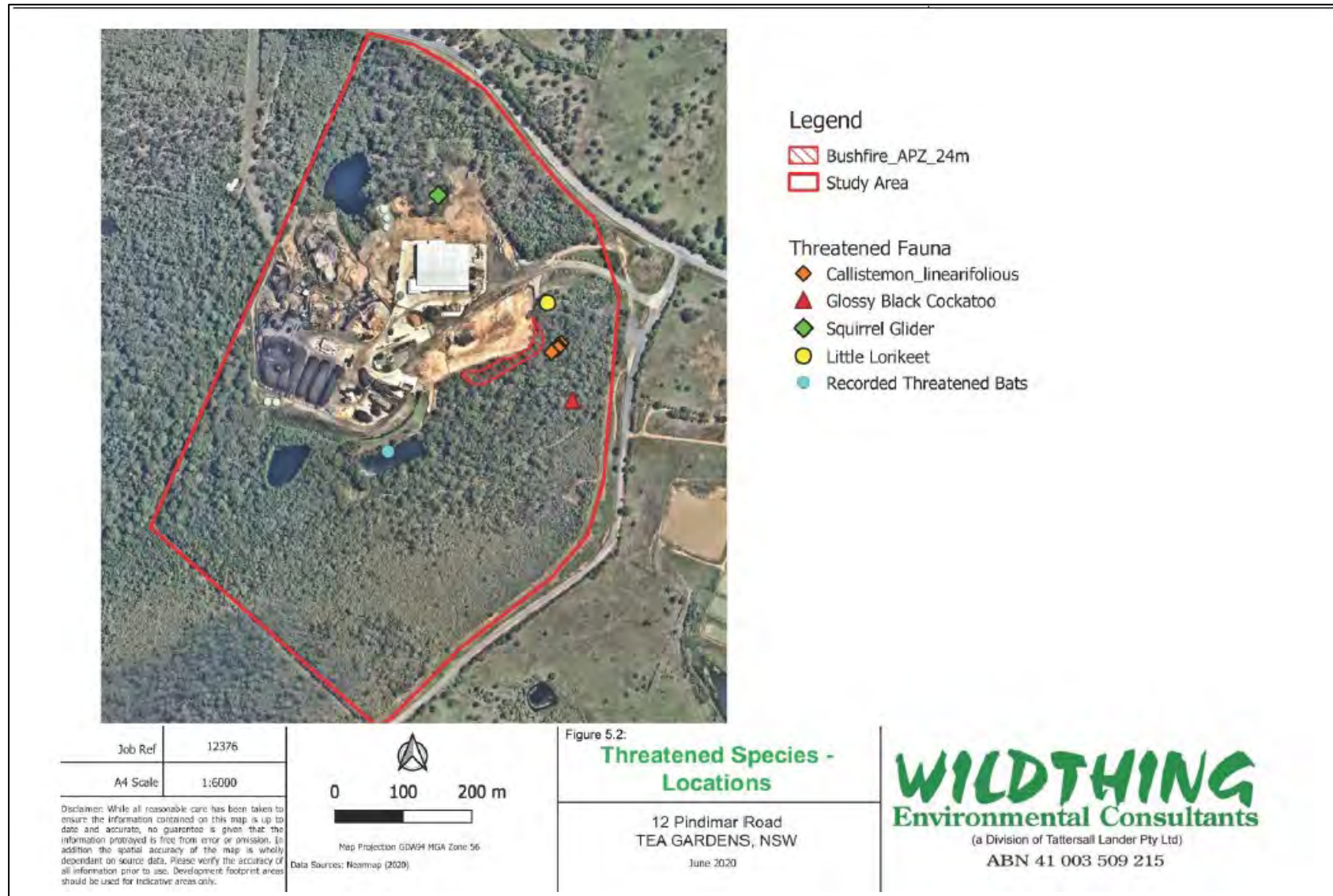
### **Threatened Flora Species**

One threatened flora species, *Callistemon linearifolius* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Sixteen additional threatened flora species were also considered to have potential habitat within the study area as a result of the presence of suitable habitat and database searches. These flora species were:

- *Cryptostylis hunteriana* (Leafless Tongue-orchid)
- *Corybas dowlingii* (Red Helmet Orchid)
- *Diuris praecox* (Newcastle Doubletail)
- *Diuris arenaria* (Tomaree Doubletail)
- *Pterostylis chaetophora* (Tall Rustyhood)

- *Tetradlea juncea* (Black-eyed Susan)
- *Angophora inopina* (Charmhaven Apple)
- *Rhodamnia rubescens* (Scrub Turpentine)
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)
- *Syzygium paniculatum* (Magenta Lilly Pilly)
- *Melaleuca biconvexa* (Biconvex Paperbark)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)
- *Cynanchum elegans* (White-flowered Wax Plant)
- *Persicaria elatior* (Tall Knotweed)
- *Asperula asthenes* (Trailing Woodruff)
- *Eucalyptus glaucina* (Slaty Red Gum)

Of these listed species the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetradlea juncea* (Black-eyed Susan). No suitable habitat is considered to be available for the remaining species. The location of the *Callistemon linearifolius* specimens are shown in **Figure 25**.



**Figure 25: Threatened Species Locations**

### **Priority Weeds and Weeds of State and National Significance**

Four priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in **Table 32**. The site lies within the Hunter Local Land Services Region.

**Table 32: Priority Weed Species Within the Project Area**

Weed Species	Legal Requirements	Additional Significance
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou Bush).	Biosecurity Zone	T, N
<i>Senecio madagascariensis</i> (Fireweed)	General Biosecurity Duty Prohibition on dealings	N
<i>Lantana camara</i> (Lantana)	General Biosecurity Duty Prohibition on dealings	T, N
<i>Senecio madagascariensis</i> Fireweed	General Biosecurity Duty Prohibition on dealings	N
<i>Rubus fruticosus</i> aggregate	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure*	N
<i>Asparagus species</i>	General Biosecurity Duty Prohibition on dealings	-

T – Listed as a Threatening Process under the NSW TSC Act 1995.

N – Weed of National Significance.

\*Priorities under the Biosecurity Act 2015

*Pinus elliotii* (Slash Pine) was particularly invasive within parts of the Project area. Control of the weed species identified will be integrated into the general land management regime of the site.

### **Habitat Appraisal**

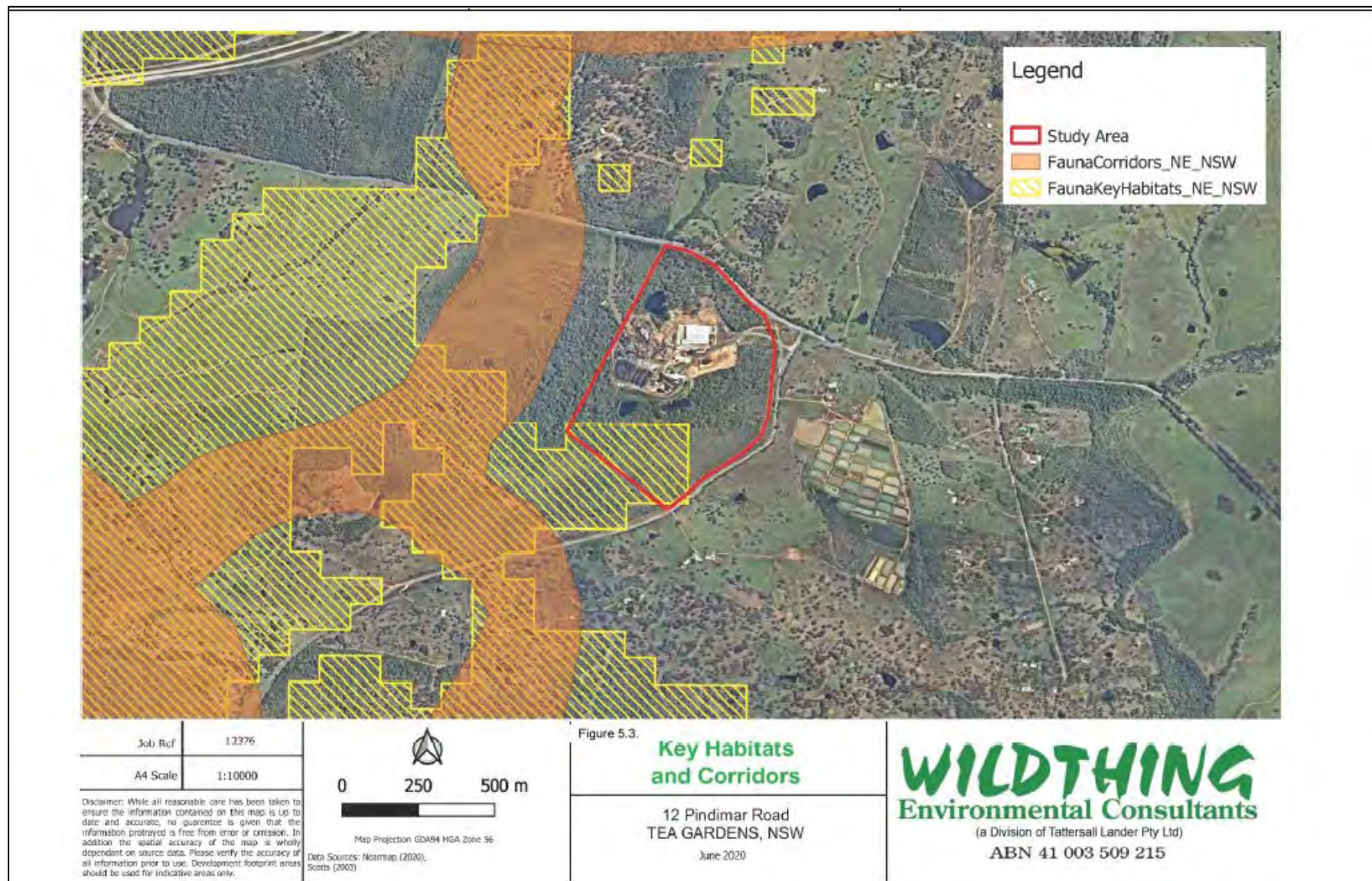
The vegetation and landforms present within the site offer potential habitat for a number of native species. The broad habitat type within the site consisted of open dry forest, swamp forest and maintained introduced grassland. A detailed description of the habitat value of each broad habitat type is provided in Section 5.2.1 of the Ecological Assessment report.

### **Habitat Corridors**

According to the National Parks and Wildlife Service Key Habitats and Corridors for Forest Fauna-Occasional Paper 32 – Figure 7.20 (Scott, 2003) an area of Key Habitat was located within the south of the Project area outside the area of impact. This area of Key Habitat is connected to a corridor which runs north-south approximately 250m to the west of the study area.

Considering the relatively small scale of the proposal and taking into account the large area of surrounding habitat, it is not likely to have a significant impact on corridors or Key Fauna Habitat. **Figure 20** shows the location of the corridor and Key Fauna Habitat in relation to the Project area.





**Figure 26: Key Habitats and Corridors**





### **Habitat For Significant Species**

An assessment of habitat attributes on site has been undertaken for significant species. Threatened species identified in this assessment as having potential habitat available on site have been considered in Section 7 of the Ecological Assessment Report

### **Fauna Appraisal Results – Small Terrestrial Mammal Trapping**

During this component of the survey two species of mammal, *Antechinus stuartii* (Brown Antechinus) and the introduced *Rattus rattus* (Black Rat) were captured. Neither of these species are listed as threatened under State or National legislation.

### **Fauna Appraisal Results – Medium Terrestrial Mammal Trapping**

During this component of the survey, one vertebrate species *Varanus varius* (Lace Monitor) was captured. This species is not listed as threatened under State or National legislation.

### **Arboreal Mammal Trapping**

During this component of the survey two species of mammal, *Petaurus norfolcensis* (Squirrel Glider) and *Antechinus stuartii* (Brown Antechinus) were captured. *Petaurus norfolcensis* (Squirrel Glider) is listed as threatened under State legislation.

### **Microchiropteran Bat Call Detection**

Seven species of microchiropteran bat were recorded within the site:

- *Austronomus australis* (White-striped Freetail Bat)
- *Micronomus norfolkensis* (Eastern Freetail Bat)
- *Chalinolobus gouldii* (Gould's Wattled Bat)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Large Bentwing-bat)
- *Myotis macropus* (Large-footed Myotis) and
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

Calls attributed to the Genus *Vespadelus* were consistent with *Vespadelus vulturnus* (Little Forest Bat). A number of calls attributed to the Genus *Nyctophilus* were likely to be either *N. geoffroyi* (Lesser Long-eared Bat) or *N. gouldi* (Gould's Long-eared Bat) were also recorded.

Five of these microchiropteran bat species are listed as threatened species:

- *M. norfolkensis*
- *M. australis*
- *M. orianae oceanensis*
- *M. macropus*
- *S. rueppellii*

### **Amphibian Survey**

A number of amphibian species were recorded within the study area during surveys. Common species recorded included:

- *Crinia signifera* (Common Eastern Froglet)
- *Litoria fallax* (Eastern Dwarf Tree Frog) and



- *Limnodynastes peronii* (Striped Marsh Frog).

None of these amphibian species are listed as threatened according to State or National legislation.

### **Reptile Survey**

Four species of reptile were recorded as a result of the reptile survey and incidental observations:

- *Intellagama lesueurii lesueurii* (Eastern Water Dragon)
- *Varanus varius* (Lace Monitor)
- *Dendrelaphis punctulata* (Green Tree Snake) and
- *Lampropholis delicata* (Grass Skink)

None of these reptile species are listed as threatened according to State or National legislation.

### **Avifauna Survey**

An array of avifauna species was found to be present within the study area. Common Species recorded included:

- *Rhipidura fuliginosa* (Grey Fantail)
- *Malurus cyaneus* (Superb Fairy-wren)
- *Lichenostomus chrysops* (Yellow-faced Honeyeater)
- *Philemon corniculatus* (Noisy Miner)
- *Cracticus tibicen* (Australian Magpie)
- *Cracticus nigrogularis* (Pied Butcherbird)
- *Dacelo novaeguineae* (Laughing Kookaburra)
- *Trichoglossus haematodus* (Rainbow Lorikeet)
- *Cormobates leucophaea* (White-throated Treecreeper)
- *Platycercus eximius* (Eastern Rosella)
- *Acanthiza pusilla* (Brown Thornbill)

Three threatened species, *Glossopsitta pusilla* (Little Lorikeet), *Haliaeetus leucogaster* (White-bellied Sea-Eagle) and *Calyptrorhynchus lathamii* (Glossy Black-Cockatoo) were observed within the study area.

### **Nocturnal Avifauna and Mammal Call Playback Survey**

There were no responses as a result of the nocturnal avifauna and mammal call playback.

### **Spotlighting Survey**

Two native vertebrate species; *Trichosurus vulpecula* (Common Brushtail Possum) and *Podargus strigoides* (Tawny Frogmouth) were observed within the study area during the spotlighting surveys. The introduced *Oryctolagus cuniculus* (European Rabbit) was also observed within the site during spotlighting surveys.

These species are not listed as threatened under State or National legislation, however the European Rabbit is listed as a Key Threatening Process under State legislation.

### Camera Trapping

Four fauna species were positively identified within the study area during camera trapping conducted between March and April 2020. Fauna species were the native *Macropus rufogriseus* (Red-necked Wallaby) and the introduced *Cervus elaphus* (Red Deer), *Vulpes vulpes* (Red Fox) and *Lepus capensis* (European Hare)

None of the species recorded on camera are listed as threatened under State or National legislation, however Dee and Fox are listed as a Key Threatening Process under State legislation.

### **8.7.5 Impact Assessment**

This Proposal does not require any additional disturbance to the previously approved disturbance footprint.

The Ecological Assessment for the previously approved disturbance footprint identified the following PCTs within the site:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion,
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands,
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast,
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast,
- Highly Disturbed Vegetation, and
- Aquatic Dam Vegetation.

The area of Swamp Forest within the subject site was found to be consistent with the Endangered Ecological Community EEC, Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions. This TEC will not be directly impacted as a result of the proposal.

One threatened flora species, *Callistemon linearifolius* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Specimens of *C. linearifolius* will not be directly impacted by the proposal.

Of the additional 16 flora species assessed, the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetratheca juncea* (Black-eyed Susan).

A total of nine threatened fauna species were recorded within the site as a result of fieldwork:

- *Glossopsitta pusilla* (Little Lorikeet)
- *Calyptorhynchus lathamii* (Glossy Black-Cockatoo)
- *Haliaeetus leucogaster* (White-bellied Sea Eagle)
- *Petaurus norfolcensis* (Squirrel Glider)
- *Micronomus norfolkensis* (Eastern Freetail-bat)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Eastern Freetail Bat)
- *Myotis macropus* (Large-footed Myotis)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

The proposal is unlikely to disrupt the life cycle of these species such that local extinction would occur.



Of the 53 remaining addressed threatened fauna species, the site was considered to contain suitable habitat for 30 of these species. Of these remaining threatened fauna species, those most likely to utilise the site would include a number of woodland birds, Grey-headed Flying-Fox and microchiropteran bats.

The proposal will not result in a reduction in habitat for these species, it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

Investigations in accordance with the State Environmental Planning Policy (Koala Habitat Protection) 2019 revealed that although the site did not contain any evidence of recent koala activity, the site contained a total of 13 Schedule 2 Koala Food Tree species which totalled greater than 15% with each PCT impacted by the development. Additionally, a total of six records of koalas within 2.5km of the site over the past 18 years (DPIE, 2020). The site was therefore considered to contain 'Highly Suitable Koala Habitat'.

The proposal will not result in the loss or modification of highly suitable koala habitat. The proposal is unlikely to have a significant impact on the Koala population such that a viable local population would be placed at risk of extinction.

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act (1999). As there is no additional disturbance to the previously approved footprint, it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

## 8.7.6 Mitigation and Conclusions

The following mitigation measures will be implemented during operation including:

- Protection of retained habitat/vegetation,
- Retention of Habitat Values, and
- Erosion Control.

Weed management measures will be undertaken at the ANL Facility including:

- All machinery introduced to the site will be cleaned of all soil and organic matter prior to entering the Site,
- Road registered haulage vehicles are required to remain on the formed access roads and include induction for drivers on need for trucks to be cleaned of loose mud, dirt and organic matter prior to entering the site. Where visible mud or organic matter is present on road registered truck, the Site Manager is to remind the driver of the need for cleaning prior to entry,
- Personnel or contractors entering the site will be reminded during inductions of the need to enter the site with clothing, boots and PPE free of potential pathogens from other properties,
- Regular monitoring and inspections to determine the current presence of weed species and their abundance. The frequency of monitoring will be dependent upon the success of the control measures and the level of infestations, and
- Control of weeds will be predominantly through manual removal to limit the use of chemicals. Chemical controls will only be utilised where there are significant outbreaks.

In conclusion, the Proposal is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

## 8.8 BUSHFIRE

### 8.8.1 Introduction

A Bushfire Risk Assessment (refer to **Appendix M**) has been prepared by Tattersall Lander Pty Ltd to satisfy the SEARs, which requested the following is addressed:



**Fire and incident management – including:**

- an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines.

A full summary of the SEARs requirements is included in **Appendix A**.

## **8.8.2 Existing Environment**

The subject site is a large rural site with an area of approximately 44.5 hectares. Within the site, there is an approved log processing and woodchip operation, as well as a maintenance shed, managers dwelling and associated infrastructure. There are currently three fire-fighting water tanks on site, each with a capacity of 144 thousand litres and Storz fitting such that they are compliant with *PBP* requirements. There are also three existing dams on the site with estimated capacity of 9.2ML (located at the northern part of the development, 6.2ML (located at the south-western part of the development) and 5.2ML (located at the southern part of the development).

There are cleared areas on the site which are utilised for the existing operations and also heavily vegetated areas which surround and are outside of the existing area of operations.

Surrounding sites consist of a mixture of vegetated lands and cleared lands which are used for rural uses, including dwellings which are located on the rural properties.

The site is located in the Midcoast Local Government Area and hence is afforded a Fire Danger Index (FDI) rating of 80.

## **8.8.3 Methodology**

The assessment was undertaken in accordance with the *Planning for Bushfire Protection Guidelines 2019* (PBP). The assessment:

- Identified the slope and aspect of the property,
- Identified all vegetation categories within 140 metres of the site,
- Determined the Bushfire Attack Category which applies to the site,
- Identified Asset Protection Zones/Setbacks, and
- Identified the Bushfire Construction level required in relation to the above for the proposed development (AS 3959).

The proposal has been assessed to ensure compliance with the Aim and objectives of the *PBP*.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

This aim is achieved through the objectives which include:

- Afford buildings and their occupants protection from exposure to a bush fire,
- Provide for a defensible space to be located around buildings,
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevents the likely fire spread to buildings,
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available,
- Provide for ongoing management and maintenance of BPMs, and
- Ensure that utility services are adequate to meet the needs of firefighters.





It is specifically noted that the 2024 Bushfire Risk Assessment is to be read in conjunction with the report which was prepared in June 2020 (refer to Appendix C of **Appendix M**). The previous report was prepared for the Development application for additions and alterations to the existing facility including a proposed extension to the wood waste processing facility in the north-western part of the site, the construction of two additional sheds in the south and south-eastern part of the facility, and an extension to the centrally located shed. It is also noted that this proposal, either now or previously, does not contain any habitable structure.

## 8.8.4 Impact Assessment

There are no changes to the footprint of the approved wood waste processing shed or a reduction in setback to existing or proposed vegetation as a result of this proposal. It is noted that there is currently a DA before the Council for minor alterations to the existing and approved footprint, and whilst these alterations include an increase in internal dimensions, they do not result in the development being closer to the existing vegetation.

### 8.8.4.1 Site Analysis

#### **Northern Aspect**

The northern aspect presents vegetation in the form of forest and there is an effective slope under vegetation in the flat/upslope category.

The separation distance between the development, including the proposed components (but excluding the water tanks) is approximately 29 metres at the minimum.

#### **Southern Aspect**

The southern aspect presents vegetation in the form of forest. The slope under this forest is variable and with a worst case in the >5-10 category. The separation distance between the development, including the proposed components, is currently 18 metres at the minimum.

#### **Eastern Aspect**

The eastern aspect presents vegetation in the form of forest and an effective slope under this vegetation in the upslope/flat category. The separation distance between the development, including the proposed components, and this vegetation is variable but currently 13 metres at the minimum.

#### **Western Aspect**

The western aspect presents vegetation in the form of forest and the effective slope under this vegetation, whilst variable, has a worst case of >5-10 degrees. The separation distance between the development, including the proposed components, is approximately 29 metres at the minimum.

#### **Minimum Asset Protection Zones**

**Table 33** below outlines the minimum Asset Protection Zones and Construction Level Requirements as per *Planning for Bushfire Protection 2019*. It is noted that given the proposal is not for a habitable building, there is no construction level required and this is only provided to demonstrate that the proposal is not located in Flame Zone (BAL-FZ).

**Table 33: Minimum Asset Protection Zones and Construction Level Requirements**

Aspect	Vegetation Classification	Slope (degrees) under Vegetation	Required Minimum/Existing Asset Protection Zone (metres)	Bushfire Attack Category
North	Forest	Flat/upslope	15	Bal-40
South	Forest	>5-10	24	Bal-40
East	Forest	Flat/upslope	15	Bal-40
West	Forest	>5-10	29	Bal-40

#### 8.8.4.2 Utilities

##### Water Supply

The subject site is not connected to the reticulated town water supply. In order to facilitate firefighting, there are three large dams, with estimated capacities of 9.2ML, 6.2ML, and 5.2ML. In addition, there are three existing firefighting water tanks, each with a capacity of 144,000 litres and there is a proposal to install two more similar tanks. These tanks are compliant with PBP. The only notable point is that there are PVC pipes which are above ground, however, these pipes are only filling pipes and their failure will not compromise the ability of these tanks for firefighting purposes and as such this should be considered acceptable.

The water supply is considered adequate and compliant with PBP.

##### Electrical Supply

The electrical supply within the site is all underground and is therefore not a bush fire ignition risk and is compliant with PBP.

##### Gas Supply

There is no gas provided to the site and no gas is proposed. This is acceptable.

#### 8.8.4.3 Access

##### Road Capacity

The subject site is accessed via Pindimar Road which runs off Myall Way. The access road is existing and is therefore considered acceptable. It is noted that the access road and areas adjacent to this access are well maintained to ensure appropriate access and egress in the event of a bush fire.

The capacity of Pindimar Road has not been checked, however, it may be safely assumed that it is adequate for the purpose of carrying fully laden fire fighting vehicles, including tankers.

##### Road Linkages to Fire Trails

There are no official fire trails on the site and given the proximity of the operations to Pindimar Road, no fire trails are considered necessary. It is noted that the plan does identify fire trails within the site and whilst unofficial, these are all weather tracks with sufficient vertical clearance for use in the event of a bush fire.

##### Emergency Egress

In the event of a bush fire emergency, evacuation would be via the access road, onto Pindimar Road and then presumably Myall Way. Whilst the access road is significantly greater than the stipulated maximum 200 metres, it is noted that the development is existing, and this proposal will not result in any intensification in the use of the development and therefore the existing access must be considered acceptable.

### 8.8.5 Discussion

The proposal in its current form will not require the removal of any vegetation, nor will include any increase in the development footprint or reduction on existing asset protection zones.

The proposal will not result in any increase in risk to occupants of the site or emergency service personnel relating to bush fire hazard.

Given the fact that the proposal does not include any form of habitable structure, the assessment of this proposal simply needs to ensure compliance with the aim and objectives of *PBP 2019* and there is no requirement for any construction to a BAL standard.

The aim of *PBP 2019* is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment. This aim is deemed to be met by meeting the objectives which are to:

- *Afford buildings and their occupants protection from exposure to a bush fire.*

**Comment** – There is an adequate APZ in place and the construction of the building is non-flammable as such it is deemed that the building and its occupants are provided adequate protection from exposure to bush fire. It is also noted that the development will in no way result in any reduction in this existing protection. It is considered that the proposal is consistent with this objective.

- *Provide for a defensible space to be located around buildings.*

**Comment** – The existing asset protection zone is considered to be an acceptable defensible space. In addition, it is noted that this asset protection zone has not been reduced as a result of this proposal as compared to that as previously approved. This objective is considered to be met.

- *Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to building.*

**Comment** – The existing asset protection zone is considered to be appropriate separation and the well managed nature of the development is considered to be one of the appropriate other measures which shall help prevent the likely spread of fire. The development as proposed will in no way alter the existing and approved situation in this regard and this objective is considered to be met.

- *Ensure that appropriate operational access and egress for emergency service personnel and occupants is available.*

**Comment** – The existing access is significantly wider than the minimum requirements and therefore, whilst it is significantly longer, it is existing and is to be considered acceptable. The proposal will in no way alter the operational access and egress for the site. The proposal is considered to meet this objective.

- *Provide for ongoing management and maintenance of BPMs.*

**Comment** – There is excellent and ongoing management of the site, and this objective is met.

- *Ensure that utility services are adequate to meet the needs of fire fighters.*

**Comment** – There is significant water supply which is located such that this objective is met.

The requirements under PBP for developments of this nature also include:

- *To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.*

**Comment** – The managed nature of the site, including the especially well managed nature of the access is considered to provide safe access and egress in the event of a bush fire. Then proposal is compliant in this regard.



- *To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.*

**Comment** – The site has an emergency management plan in place for events such as bush fire and this ensures compliance in this regard.

- *To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.*

**Comment** – The water supply is acceptable for bush firefighting purposes; the electrical supply is located so that it is not a hazard; there is no gas supply. The proposal is compliant in this regard.

- *To provide for the storage of hazardous materials away from the hazard wherever possible.*

**Comment** – The nature of the business is that there are flammable materials stored within the site (e.g. timber waste product). The location of such storage areas has been sited to ensure there is sufficient distance from hazard and also so that in the event of a bush fire, it will not result in any potential obstruction for access to or egress from the site. Where materials are stored in sheds near the edge of the development, the sides of the sheds facing the hazard are closed and all apertures greater than 2mm are to be adequately screened. The proposal is compliant in this regard.

In addition to meeting the above requirements, it is noted that all parts of the development, and especially of the proposal, are located outside of BAL-FZ and therefore outside of Flame Zone and this will assist in the prevention of fire spread from any potential bush fire to within the site.

## 8.8.6 Conclusion

The proposal is for an alteration to the existing use of a shed at 12 Pindimar Road, Tea Gardens (Lot 1 in DP 714149). The proposal has been assessed as per the NSW Rural Fire Service *Planning for Bushfire Protection Guidelines (2019)* and the proposal is considered fully compliant, the proposal will in no way result in any increase in risk relating to bush fire.

## 8.9 VISUAL

### 8.9.1 Introduction

As this developing is not proposing to change the form or character of the existing site of surrounds, a separate visual assessment report has not been prepared. Alternatively, a review of visual impacts has been undertaken as part of this EIS. The following has been requested by the project SEARS:

**Visual** – *including an impact assessment at private receptors and public vantage points.*

### 8.9.2 Existing Environment

#### 8.9.2.1 Visual Amenity

Tea Gardens is located along the banks of the Myall River, on the southern fringe of the Mid North Coast of NSW. Tea Gardens is visually characterised by a contrast of coastal landscapes, waterways, native bushlands, and a small township. To its north lie the extensive Myall Lakes, and to the east, the Pacific Ocean. Southward, the waters of Port Stephens, and to the west, expanses of native bushland. Surrounding the Tea Gardens area are expanses of native bushland, including the Myall Lakes National Park. This natural environment is home to a diverse array of flora and fauna.

The scenic quality of an area is considered to improve with increasing diversity of topographic ruggedness, vegetation patterns, natural and agricultural landscapes and water bodies. However, the scenic quality of an area is typically considered to decrease with views of the built environment (including both urban and industrial development) and areas of extensive earthworks.



Land in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. Residential homes are primarily located to the north, south, and west of the site, with a commercial fish farm located to the east. It is considered that there is limited potential for further land subdivision and residential development in the area given the existing zoning around the site.

### **8.9.2.2 Project Visibility**

The Project does not require any additional infrastructure or changes to the existing approved wood waste processing shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste. The varied topography and remnant vegetation bordering the site provides for natural visual screening of the Project infrastructure.

## **8.9.3 Methodology**

### **8.9.3.1 Viewpoint Analysis**

A viewpoint analysis considers the likely impact that a development would have on the existing landscape character and visual amenity by selecting prominent sites or viewpoints. Viewpoints are selected to illustrate a combination of the following:

- Present landscape character types
- Areas of high landscape or scenic value
- Visual composition
- Range of distances
- Varying aspects
- Various elevations
- Various extent of development visibility (full and partial visibility) and
- Sequential along specific routes

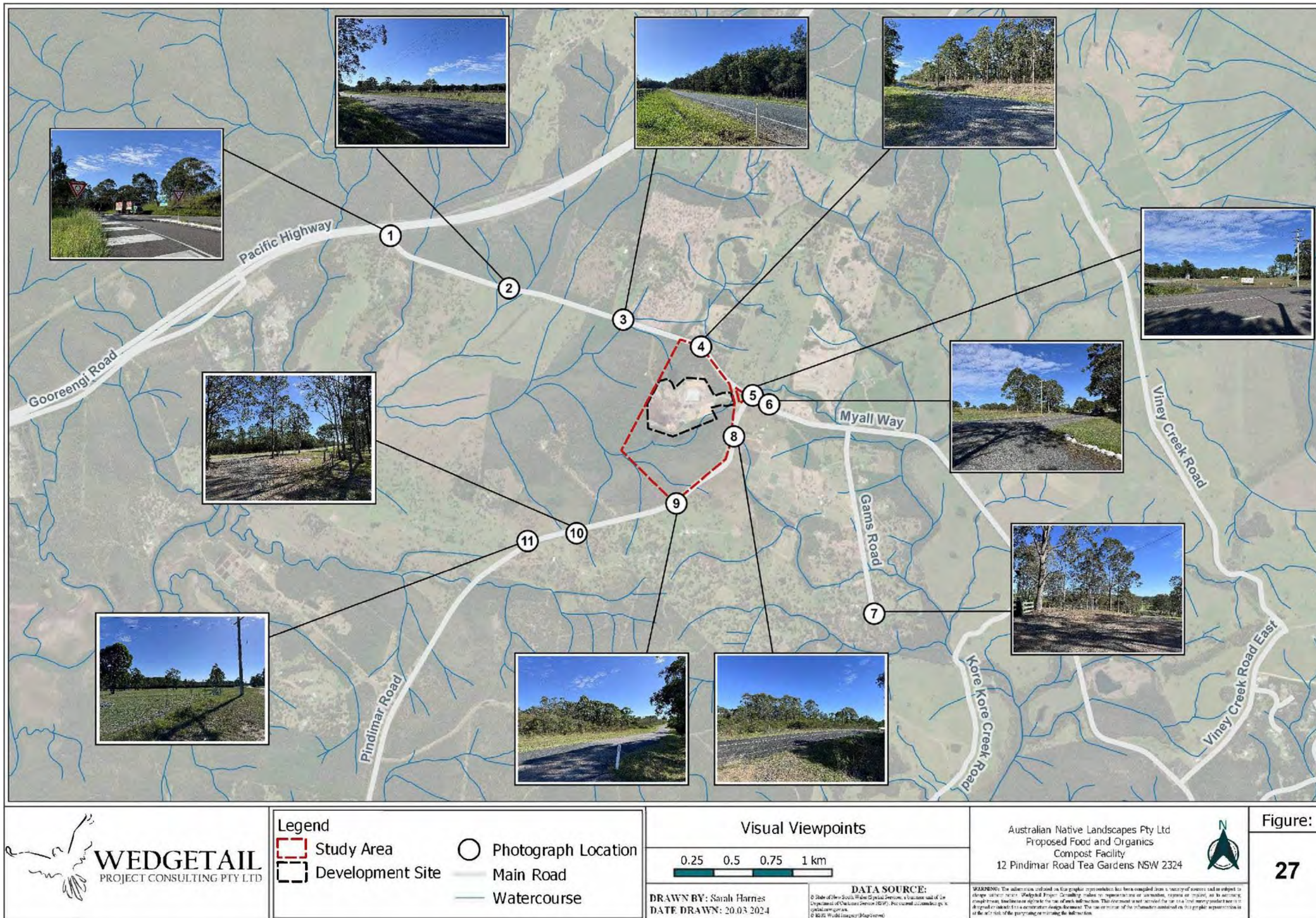
Viewpoints have been carefully selected to be representative of the range of views within the study area. The selection of viewpoints is informed by topography, field observations and other relevant influences such as access, landscape character and the popularity of vantage points.

A total of 11 viewpoints were recorded as part of the field work process. All viewpoints were taken from publicly accessible roads surrounding the site. The viewpoints which have been included represent the areas from where the Project would appear most prominent, either based on the degree of exposure or the number of people likely to be affected.

### **8.9.3.2 Process of Viewpoint Analysis**

Once the viewpoint was selected, photographs were taken at eye level from the viewpoints towards the Project site. The visual impact of the viewpoint was then assessed both on site and with the topographic and aerial information to ensure accuracy. Viewpoint locations and photographs taken from these locations looking back towards the Project area are shown on **Figure 27**.





**Figure 27: Viewpoint Locations**



## 8.9.4 Impact Assessment

Visual impacts are dependent on the characteristics of the existing landscape, the sensitivity of viewers and the extent to which visual modification will occur as a result of the Project. The visual impact assessment is focused on the most sensitive receivers such as the private residences and the major travel routes.

### 8.9.4.1 Private Residences

The nearest sensitive receivers to the Project are shown in **Table 34** below and **Figure 5**.

**Table 34: Nearest Sensitive Receivers to Existing Project**

Address	Proximity to Existing Project
196 Myall Way, Tea Gardens	<ul style="list-style-type: none"> <li>Approximately 120m west of the Project</li> </ul>
27 Pindimar Road, Tea Gardens	<ul style="list-style-type: none"> <li>Approximately 560m east of the Project</li> </ul>
Fish Farm	<ul style="list-style-type: none"> <li>Approximately 640m southeast of the Project</li> </ul>
87 Pindimar Road, Tea Gardens	<ul style="list-style-type: none"> <li>Approximately 800m south-southeast of the Project</li> </ul>
124 Pindimar Road, Tea Gardens	<ul style="list-style-type: none"> <li>Approximately 870m southwest of the Project</li> </ul>

No views of the site infrastructure will be visible from any of the residences due to the screening effect of existing topography and remnant vegetation.

### 8.9.4.2 Transport

Myall Way to the north and Pindimar Road to the east are screened from the Project site by topography and vegetation. The low height of infrastructure and equipment at the site also reduces the visual impacts of the Project.

It is considered that the Project will not result in any additional visual impacts, which if any, are currently experienced by travellers on these transport routes given the screened views available to users of these transport routes, their distance to visible components of the Project and the Project does not require any additional infrastructure or changes.

## 8.9.5 Mitigation and Management

As the Project site is already adequately screened from view, no additional mitigation measures are proposed. The design and location characteristics of the Project provide sufficient mitigation. Retention of existing trees within the site are recommended to maintain the existing level of screening.

## 8.9.6 Conclusions

The proposed Project can be undertaken whilst maintaining the core landscape character of the area and having a negligible visual impact on the surrounding visual landscape.

## 8.10 WASTE MANAGEMENT

### 8.10.1 Introduction

This waste assessment has been prepared to quantify the waste generated by the proposed development during operation and to address the potential environmental impacts associated with waste handling, storage and disposal. The assessment addresses the aims, objectives and guidelines in the *NSW Waste Avoidance and Sustainable Materials Strategy 2041*.

The assessment has been prepared to satisfy the SEARs, which requested the following is addressed:

**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 Sustainable Materials Strategy 2041.*

### 8.10.2 Existing Environment

ANL are seeking to receive and compost 50,000tpa of FOGO within an existing approved wood waste building, with the site currently approved to accept and process up to 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics. The 50,000tpa FOGO operation would form part of the existing EPA licenced volume of 150,000tpa.

The site contains an approved landscape supply operation (and bagging complex), waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, aerated composting platform, site office and manager residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

### 8.10.3 Objectives

The objectives of waste management for the proposed development are to:

- Maximise reuse and recycling of materials,
- Minimise waste generation,
- Ensure appropriate collection and storage of waste,
- Maximise source separation and recovery of recyclables,
- Ensure appropriate resourcing of waste management systems, including servicing,
- Minimise risk to health and safety associated with handling and disposal of waste and recycled material and ensure optimum hygiene,
- Receive and process organic residues from the local community,
- Maximise the integration of the concepts of the circular economy,
- Minimise adverse environmental impacts associated with waste management, and
- Discourage illegal dumping by providing on site storage, and removal services.

## 8.10.4 Legislative Requirements

Legislation and guidelines applicable to the waste management assessment include:

- *Protection of Environment Operations Act 1997 (POEO Act)*
- *NSW EPA Waste Classification Guidelines*
- *Environmental Planning and Assessment Act 1979*
- *Waste Avoidance and Resource Recovery Act 2001*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Occupational Health and Safety Act 2000 and the Occupational Health and Safety Regulations 2001*
- *Environmental Protection (Controlled Waste) Regulation 2001*
- *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Part 5A, Division 4, Clause 5A.26 Garbage and waste storage*
- *Australian Standards 2601-2001 Demolition of Structures*
- *Mulch Resource Recovery Order 2016 and Mulch Resource Recovery Exemption 2016*
- *NSW EPA's Draft Protocol for managing asbestos during resource recovery of construction and demolition waste*
- *NSW EPA's Environmental guidelines: Composting and related organics processing facilities*
- *NSW Plastics Action Plan*
- *NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs*
- *NSW Waste Avoidance and Sustainable Materials Strategy 2041*

## 8.10.5 Impact Assessment

### 8.10.5.1 Construction Phase

As the wood waste building has previously been designed to accept and process wood and vegetative waste (wood waste as described in **Section 4.3**), the building will not require any modifications. As such, the proposed development will not generate any demolition or construction waste.

### 8.10.5.2 Operational Phase

#### **Processing Capacity and Input Materials**

ANL are seeking to receive and compost 50,000tpa of FOGO within an existing approved wood waste processing building onsite, which is currently approved to accept and process 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics. The 50,000tpa FOGO operation would form part of the existing EPA licenced volume of 150,000tpa. The Hawkes Nest and Tea Gardens areas currently supply green waste to the operations for processing.

The operational phase of the project consists of receiving, inspecting, processing and storing waste wood materials and FOGO. The resulting products will be stored and sold in bulk as landscape supplies from the site.

#### **Wood Waste and FOGO Processing and Composting**

Wood waste and FOGO processing consist of the following key process elements:

- Waste receipt and decontamination.
- Shredding in a slow speed shredder and placed onto an aerated floor system platform (Aero-Sorb Platform).

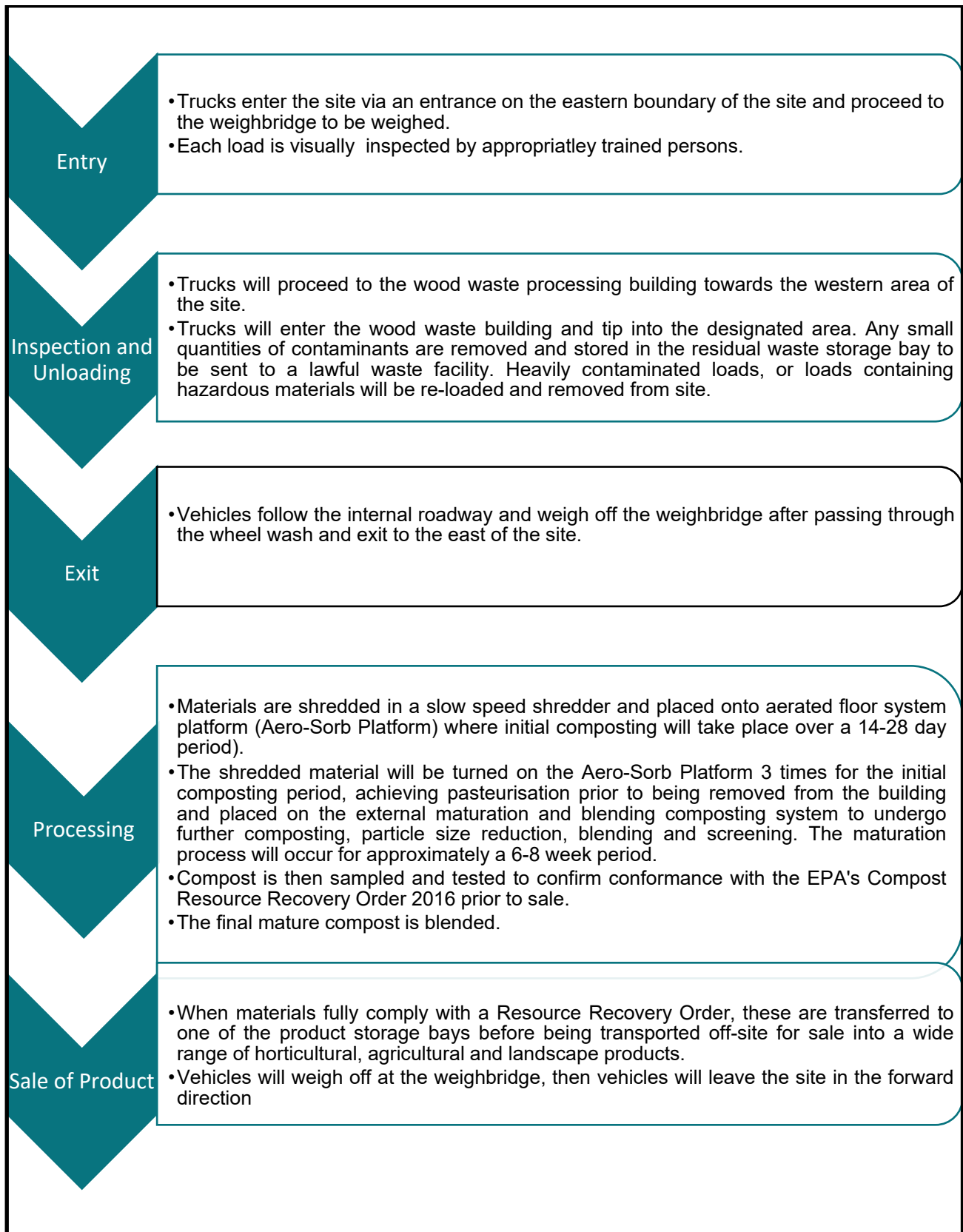


- Pasteurisation and composting in Aero-sorb Platform.
- Removal from building and placed on external maturation and blending composting system to undergo further composting, particle size reduction, blending and screening.
- Blending of final mature compost for sale into a wide range of horticultural, agricultural and landscape products.
- Product load-out.

Processing of wood waste will remain the same as approved in the existing Development Consents as discussed in **Section 4.2**. The only change will be a reduction in the amount of wood waste accepted at the site to 100,000tpa to keep the total received tonnages of organics at 150,000 tpa.

A description of each of these key process elements is provided in **Section 4**. A flow chart for the wood waste and FOGO processing and composting operation is described in **Figure 28** below.





**Figure 28: Process Flow Chart for Wood Waste and FOGO Operation**

### 8.10.5.3 Waste and Product Quantities

During operation, the following key wastes and products are expected to be generated:

- Approximately 90,000tpa (40% mass loss) of wood waste and FOGO derived products (mulch, compost, soil conditioner) to AS 4454-2012 (Standards Australia, 2012),
- Up to 2,000tpa of feedstock contaminants (plastics, other organics, metals, other miscellaneous), and
- Operational waste from employees, general solid waste (non-putrescible/ putrescible).

The wood waste and FOGO derived product mix would depend on market requirements. The final product will be sampled and tested to confirm compliance with relevant standards and guidelines prior to sale.

The total amount of residual waste is expected to be up to approximately 2,000tpa. The site operations will generate very little waste itself. The vast bulk of waste materials will be brought onto the site for processing. While a small proportion of this material will be non-recyclable residual waste, most material will be recovered, processed, and sold as products.

A summary of the expected operational feedstock inputs, product outputs, and residual waste are shown in **Table 35**. It should be noted that the compost manufacturer estimates assume a mass loss of 40% during the composting process (due to loss of carbonaceous material and moisture).

**Table 35: Operational Waste Summary**

Material Stream	Waste Classification	Estimated Quantity	Storage	Potential Destination	End Use
<b>Inputs</b>					
FOGO Feedstock	General solid waste (putrescible)	50,000tpa	Wood waste building	-	-
Wood waste	General solid waste (non-putrescible)	100,000tpa	Maturation and compost platform	-	-
Contaminants	General solid waste (non-putrescible/ putrescible)	Up to 2,000tpa	Enclosed skip bin (wood waste building)	Landfill	Disposed/recycled
<b>Outputs</b>					
Wood waste and FOGO derived products	-	90,000tpa	Enclosed concrete bay in product storage shed	Various	Horticultural, agricultural and landscape products
<b>Residual Waste</b>					
Operational Employee Waste	General solid waste (non-putrescible/ putrescible)	40 m <sup>3</sup>	Rubbish bins in wood waste building and office, skips bins (adjacent to site office)	Landfill/recycling facility	Disposed/recycled

Batteries	Hazardous waste	Nominal	Segregated area on-site	Recycling facility	Recycled
Lubricants/oils	Liquid waste	Nominal	Bunded holding tank	Recycling facility	Disposed/recycled
Leachate	Liquid waste	Nominal	Temporarily stored in a 150,000 litre in-ground sealed holding tank	Reused on-site	Recycled on-site
Process Water	Liquid waste	Nominal	Temporarily stored in holding tanks	Reused on-site	Recycled on-site
Sewage	Liquid waste	Nominal	Tank	On-site biocycle	On-site treatment

#### 8.10.5.4 Operational Waste Handling and Management

All waste generated during operation will be managed using the waste hierarchy approach. Where waste cannot be avoided, reused or recycled, it will be classified and appropriately disposed of in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).

Operational waste generated by employees will be separated by source to recover recyclable materials and divert wastes from landfills. Processing waste including leachate will be captured and re-used in processing activities.

All waste generated during operation will be managed in accordance with the waste provisions contained within relevant legislation and guidelines, as listed in **Section 8.10.4**.

Management measures for operational waste, including contingency measures for wastes and residues that are unable to be avoided, re-used, recycled or treated are outlined in **Table 36**.

**Table 36: Waste Management Measures**

Waste	Hierarchy	Management Measures	Recycling/Disposal Options
General waste	Dispose	Collected in on-site bins and disposed of off-site at licenced waste management facilities	Licenced waste management facilities
Food waste	Dispose	Collected and composted	At the site
Recyclables	Recycle	Collected in on-site recycling bins and transferred off-site to licenced recycling facilities	Licenced recycling facilities
Feedstock contaminates	Recycle/dispose	Recyclable materials are separated where possible, collected and transferred off-site to licenced recycling facilities. General waste materials are collected in on-site bins and disposed of off-site at licenced waste management facilities	Licenced recycling and waste management facilities
Sewage	Dispose	Sewage from office and amenities discharged to the sewer	Discharge to sewer
Leachate	Reuse	Collected and re-used in processing operations	Re-used in processing operations
Oils, lubricants	Dispose	Collected and transferred to licenced liquid waste management facilities	Licenced waste management facilities

Waste	Hierarchy	Management Measures	Recycling/Disposal Options
Batteries	Dispose	Collected and disposed of off-site at licenced waste management facilities	Licenced waste management facilities

### **Waste Storage During Operational Phase**

Incoming wood waste and FOGO feedstock will be stored in the wood waste processing building which has a maximum storage capacity of approximately 5,000 tonnes at any one time. Contaminants extracted from the incoming feedstock will be stored in bins next to the waste processing area for collection and disposal at a licenced waste facility. Where possible, recyclables will be separated from the contaminants and placed into bins for collection and recycling at a licenced facility. All bins will be clearly labelled to avoid cross contamination and incorrect disposal.

Waste from operational employees will be stored in bins strategically located through the site including the site office, workshop, sheds and communal areas. Bins will be provided for general waste and recyclables to ensure source separation. The waste bins will be emptied periodically into larger skip bins to be collected and transferred to licensed waste and recycling facilities.

### **Wood Waste and FOGO Derived Product Storage**

Wood waste and FOGO derived materials will be stockpiled on the maturation and blending pad prior to product load-out. The maturation pad is fully concreted and drains to the internal site water management system to ensure no dirty water is released from the site.

### **Waste Tracking, Record Keeping and Quality Control**

All incoming feedstock loads will be visually inspected upon unloading to ensure materials are conforming, as per commercial agreements with feedstock providers.

Non-conforming waste will include loads with greater than 2% by weight of contaminants. Small quantities of contaminants including plastics, metals etc will be handled during the sorting and separation process and would not constitute a non-conforming load.

Where a non-conforming load is identified during visual inspections, the truck would not be unloaded, and the feedstock would be rejected. Where the feedstock has been unloaded and identified as non-conforming, the feedstock will be re-loaded onto the truck and the full load will be rejected. Details of the time, date, vehicle and the reasons for rejection will be recorded and maintained by ANL.

The quality control measures proposed during operation to track incoming waste and outgoing products are listed in **Table 37**.

**Table 37: Quality Control, Record Keeping and Waste Tracking Measures**

Aspect	Measures
Signage	Signage will be displayed at the site entrance which clearly identifies the approved feedstock accepted at the facility and non-forming waste types.
Wood Waste and FOGO Specifications	Commercial agreements will be in place with providers to ensure all incoming feedstock products are in accordance with agreed specifications.
Non-conforming waste	Details of non-conforming loads will be recorded in a register which will include - date, time, vehicle registration, type of waste rejected and reasons for rejection etc.
Feedstock, product output and product storage	Signage will be clearly displayed to ensure incoming feedstock and feedstock derived products are unloaded/stored in the correct areas.
Wood waste and FOGO derived product specifications	Wood waste and FOGO derived products will be sampled and tested to ensure compliance with customers' specifications and applicable guidelines and standards.
Visual inspections	Regular visual inspections will be undertaken of the incoming feedstock, product storage locations, and outgoing products to ensure compliance with the site operation plan and site approvals. Where any non-compliance is identified, corrective actions will be undertaken immediately to rectify the situation.
Training	All staff and contractors working on site will undergo training in waste management. The training will address waste minimisation strategies, waste recognition, recycling, record keeping, etc. Records will be kept of all staff undertaking the site training.
Audits	Audits will be undertaken to assess the effectiveness of controls and compliance with the site operations plan, approval, and relevant guidelines.
Incoming and outgoing product records	All incoming feedstock and outgoing products will be weighed using the weighbridge and recorded.

#### 8.10.5.5 Potential Operational Waste Impacts

Potential impacts associated with waste generation during operation are summarised in **Table 38**.

**Table 38: Potential Operational Waste Impacts**

Aspect	Potential Impacts
Acceptance of non-conforming waste	<ul style="list-style-type: none"> <li>• Cross contamination of wastes</li> <li>• Exposure to potentially hazardous waste</li> <li>• Loss of production</li> </ul>
Feedstock storage and segregation of waste	<ul style="list-style-type: none"> <li>• Exceedance of storage capacities</li> <li>• Cross contamination of waste due to improper segregation</li> <li>• Odour</li> <li>• Fire risk</li> </ul>
Leachate management	<ul style="list-style-type: none"> <li>• Soil or groundwater contamination</li> <li>• Uncontrolled release of leachate</li> </ul>



Aspect	Potential Impacts
Waste transportation	<ul style="list-style-type: none"> <li>Dust generation leading to reduced air quality and migration of dust onto road surfaces.</li> <li>Odour.</li> <li>Increased traffic</li> <li>Vehicle collisions/damage</li> </ul>
Unlicensed waste contractors or facilities handling waste	<ul style="list-style-type: none"> <li>Regulatory non-compliance</li> </ul>

#### 8.10.5.6 Mitigation and Management Measures

**Table 39** provides a summary of the mitigation and management measures that will be implemented to address potential waste impacts.

**Table 39: Summary of Mitigation Measures**

Aspect	Mitigation Measures
Waste Storage and Management	<ul style="list-style-type: none"> <li>Waste management and minimisation will form part of the site induction program. All Project and site personnel will be trained in the requirements of waste minimisation, recognising which types of materials are recyclable and their obligations to use recycling facilities provided on site.</li> <li>Specific locations for waste management (e.g. processing locations, waste bin locations, material stockpile locations) will be established on site and signposted appropriately.</li> <li>Waste disposal bins will have clear signage and instructions for use to avoid cross-contamination.</li> <li>Waste will be disposed to an appropriate licensed facility.</li> <li>All waste being transported off-site will be covered and disposed of or recycled at an appropriately licensed facility.</li> <li>Storage of all hazardous substances and dangerous goods will be in accordance with SDS requirements in a bunded area.</li> <li>Any hazardous waste will be managed and handled by an appropriately licensed contractor and transported for disposal to a licensed facility.</li> <li>Any material contaminated by spills i.e. fuel, oil, lubricants, etc., including empty fuel, oil, and chemical containers, will be stored in a sealed secure container within a bunded area and will be transported to a waste disposal site approved by the NSW EPA to accept such material.</li> <li>Product storage areas will be located away from waterways and the stormwater system.</li> <li>Waste bins will be regularly collected and disposed of at a licensed waste facility.</li> <li>All incoming feedstocks will be unloaded in an enclosed building and prepared for composting as soon as possible.</li> <li>Feedstock delivery and product outgoing schedules will be coordinated to avoid a queue of incoming or outgoing trucks for extended periods of time.</li> <li>Leachate will be collected in a 150,000 litre inground storage tank and re-used in the composting operations.</li> <li>Fuel will be stored in a self-bunding tank. A spill kit will be kept next to the fuel storage area.</li> <li>Regular monitoring will be undertaken to track waste management on site. This will be through a series of formal and informal inspections at regular intervals.</li> <li>Audits will be undertaken to assess the effectiveness of controls and compliance with the site operations plan, approval, and relevant guidelines.</li> <li>Wood waste and FOGO derived products will be sampled and tested to ensure compliance with customers specifications and applicable guidelines and standards.</li> <li>Commercial agreements will be in place with providers to ensure all incoming feedstock products are in accordance with agreed specifications.</li> </ul>

## 8.11 SOCIO-ECONOMIC

### 8.11.1 Introduction

This section provides an assessment of the social and economic impacts of the proposed development, including the identification of the socio-economic characteristics of the surrounding area and the wider MCC LGA.

### 8.11.2 Existing Environment

The proposed development aims to process up to 50,000 tonnes per annum (tpa) of FOGO within the existing approved wood processing building at the current composting facility. The subject site, situated at 12 Pindimar Road, Tea Gardens, NSW (Lot 1 DP714149), falls within the jurisdiction of the Mid Coast Local Government Area (LGA) and is designated under land zoning RU2 – Rural Landscape.

The coastal village of Tea Gardens is situated about 5.5 kilometers southeast of the site. Further southeast, approximately 9km away, lies the village of Hawks Nest, which is part of the larger seaside community. The nearest large town offering significant employment opportunities and services is Raymond Terrace, located roughly 37km to the southwest.

The subject land is bordered by land similarly zoned for rural use to the north, south, east, and west. Land in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. Residential homes are primarily located to the north, south, and west of the site, with a commercial fish farm located to the east. The site spans approximately 42.47 ha in total area.

The site is located at the junction of Pindimar Road and Myall Way. The nearest noise-sensitive properties are residential dwellings to the east, south, and west of the site (refer to **Figure 12**)

Tea Gardens is located within the Mid Coast Council LGA which is located in the Mid-North Coast region and the LGA extends inland to the Barrington Tops National Park west of Gloucester, plus Stroud, Bulahdelah, and Wingham. It includes the Manning River and valley adjoining the Three Brothers mountains. The MCC LGA is bound by Dugong, Port Stephens, Port Macquarie, and Walcha LGA'S. The MidCoast is a large and diverse region of 195 towns, villages, and localities. The MidCoast ranges from beaches to mountains over an area of 10,000 square kilometres.

According to the Australian Bureau of Statistics (ABS), Tea Gardens has a population of 3,288 people as per the 2021 census data and is typically a tourist area, of these 48.2% were male and 51.8% were female. Aboriginal and/or Torres Strait Islander people made up 3.6% of the population as shown in , and .

**Table 40: Population Statistics 2021**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Male	1,586	48.2	3,984,166	49.4	12,545,154	49.3
Female	1,702	51.8	4,087,995	50.6	12,877,635	50.7

**Table 41: 2021 Census Indigenous Status**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Aboriginal and/or Torres Strait Islander	118	3.6	278,043	3.4	812,728	3.2
Non-Indigenous	2,964	90.1	7,404,499	91.7	23,375,949	91.9
Indigenous status not stated	204	6.2	389,616	4.8	1,234,112	4.9

The median age of people in the LGA was 69 years compared to 39 years for New South Wales and 38 for Australia. Children aged 0-14 years made up 5.9% of the population and people aged 85 years and over made up 7.3% of the population. Of the people in the area aged 15 years and over, 65.3% were married and 9.5% were either divorced or separated. Tea Gardens has one of the oldest populations in Australia. This is also an increase from 61 in 2011. 13.5% of residents are aged 65–69; this compares with the national figure of 5.1%.

3.6% of residents are Aboriginal or Torres Strait Islander; the median age among this group is 39 as shown in **Table 42** and **Table 43**.

**Table 42: 2021 Census Age Statistic**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
<b>Children</b>						
0-4 years	45	1.4	468,056	5.8	1,463,817	5.8
5-9 years	69	2.1	500,810	6.2	1,586,138	6.2
10-14 years	78	2.4	501,135	6.2	1,588,051	6.2
<b>Studying or working</b>						
15-19 years	85	2.6	457,896	5.7	1,457,812	5.7
20-24 years	45	1.4	496,185	6.1	1,579,539	6.2
25-29 years	45	1.4	555,967	6.9	1,771,676	7.0
30-34 years	45	1.4	586,057	7.3	1,853,085	7.3
35-39 years	68	2.1	580,185	7.2	1,838,822	7.2
40-44 years	84	2.6	522,984	6.5	1,648,843	6.5
45-49 years	95	2.9	516,915	6.4	1,635,963	6.4
50-54 years	108	3.3	500,027	6.2	1,610,944	6.3
<b>Approaching Retirement or Retired</b>						
55-59 years	183	5.6	490,155	6.1	1,541,911	6.1
60-64 years	284	8.7	471,628	5.8	1,468,097	5.8
65-69 years	441	13.5	416,493	5.2	1,298,460	5.1
70-74 years	591	18.0	372,234	4.6	1,160,768	4.6
75-79 years	483	14.7	268,110	3.3	821,920	3.2
80-84 years	287	8.8	183,409	2.3	554,598	2.2
85 years and over	239	7.3	183,895	2.3	542,342	2.1
Median age	69	N/A	39	N/A	38	N/A

**Table 43: 2021 Census Marital Status**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Married	2,023	65.3	3,124,151	47.3	9,665,708	46.5
Separated	66	2.1	209,657	3.2	674,590	3.2
Divorced	292	9.4	569,516	8.6	1,831,952	8.8
Widowed	311	10.0	339,990	5.1	1,029,142	5.0
Never married	409	13.2	2,358,844	35.7	7,583,393	36.5

75.7% of residents report being born in Australia; higher than the national average of 66.7%. Other than Australia the top countries are England (6.6%); New Zealand (1.7%), and Scotland (0.9%). The most common reported ancestries in Tea Gardens are English, Australian, and Irish. 64.2% of residents report both parents being born in Australia, higher than the national average of 45.9% as shown in **Table 44**.

**Table 44: 2021 Census Country of Birth, top responses**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Australia	2,489	75.7	5,277,497	65.4	17,019,815	66.9
Other top responses:						
England	217	6.6	231,385	2.9	927,490	3.6
New Zealand	57	1.7	118,527	1.5	530,492	2.1
Scotland	29	0.9	27,659	0.3	118,496	0.5
Germany	17	0.5	28,921	0.4	101,255	0.4
South Africa	17	0.5	49,740	0.6	189,207	0.7

The median weekly personal income for people aged 15 years and over in Tea Gardens LGA was \$529 compared to the NSW median of \$813 and the Australian median of \$805 as shown in **Table 45**.

**Table 45: 2021 Census Median Weekly Incomes**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Personal (b)	\$529	N/A	\$813	N/A	\$805	N/A
Family (c)	\$1,181	N/A	\$2,185	N/A	\$2,120	N/A
Household (d)	\$991	N/A	\$1,829	N/A	\$1,746	N/A

In 2021 there were 797 who reported being in the labour force in the week before Census night. Of these 41.5% were employed full-time, 42.5% were employed part-time and 4.9% were unemployed as shown in **Table 46**.

**Table 46: 2021 Census Participation in the Labour Force**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
In the labour force	797	25.7	3,874,012	58.7	12,695,853	61.1
Not in the labour force	2,089	67.4	2,341,417	35.5	6,888,081	33.1
Not stated	212	6.8	386,728	5.9	1,200,851	5.8

The most common occupations in Tea Gardens included Community and Personal Service Workers 16%, Technicians and Trades Workers 14.4%, Labourers 13.7%, Managers 13.3%, professionals 13.2%, Sales workers 10.6%, Clerical and Administrative Workers 10.3%, Machinery Operators and Drivers 6.1% as shown in **Table 47**.

**Table 47: 2021 Census Occupation, top Responses**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Community and Personal Service Workers	121	16.0	390,779	10.6	1,382,205	11.5
Technicians and Trades Workers	109	14.4	436,589	11.9	1,554,313	12.9
Labourers	104	13.7	300,966	8.2	1,086,120	9.0
Managers	101	13.3	536,820	14.6	1,645,769	13.7
Professionals	100	13.2	952,131	25.8	2,886,921	24.0
Sales Workers	80	10.6	294,889	8.0	986,433	8.2
Clerical and Administrative Workers	78	10.3	480,612	13.0	1,525,311	12.7
Machinery Operators and Drivers	46	6.1	222,186	6.0	755,863	6.3

The main industry of employment for Tea Gardens residents is as follows and shown in **Table 48**:

- Aged Care Residential Services 9.9%
- Supermarkets and Grocery Stores 3.4%
- Cafes and Restaurants 3.4%
- Real Estate Services 2.5%
- Other Social Assistance Services 2.5%



**Table 48: 2021 Census Industry of Employment, top responses**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Aged Care Residential Services	75	9.9	80,859	2.2	258,274	2.1
Supermarkets and Grocery Stores	26	3.4	92,329	2.5	299,810	2.5
Cafes and Restaurants	26	3.4	72,942	2.0	268,005	2.2
Real Estate Services	19	2.5	41,059	1.1	119,283	1.0
Other Social Assistance Services	19	2.5	87,430	2.4	278,221	2.3

Post-school education statistics from the 2021 Census indicate that bachelor's degree Level (and higher) qualifications were held by 13% compared to a significantly higher percentage for NSW (27.8%). Advanced Diploma and Diploma Level qualifications are held by 10.7% and 9.4% in NSW. Certificate-level qualifications were held by 19.1% of the population as shown in **Table 49**.

**Table 49: 2021 Census Post-School Level Education Statistics**

People <i>All people</i>	Tea Gardens	%Tea Gardens	New South Wales	%New South Wales	Australia	%
Bachelor's Degree level and above	404	13.0	1,838,502	27.8	5,464,631	26.3
Advanced Diploma and Diploma level	332	10.7	616,322	9.3	1,946,738	9.4
Certificate level IV	85	2.7	216,768	3.3	719,425	3.5
Certificate level III	508	16.4	771,009	11.7	2,617,766	12.6
Year 12	320	10.3	954,987	14.5	3,104,116	14.9
Year 11	85	2.7	212,538	3.2	958,803	4.6
Year 10	565	18.2	698,390	10.6	2,086,306	10.0
Certificate level II	0	0.0	4,703	0.1	13,687	0.1
Certificate level I	6	0.2	764	0.0	2,614	0.0
Year 9 or below	293	9.5	487,855	7.4	1,490,444	7.2
Inadequately described	142	4.6	184,252	2.8	506,259	2.4

No educational attainment	10	0.3	64,827	1.0	175,844	0.8
Not stated	352	11.4	549,965	8.3	1,694,773	8.2

### 8.11.3 Methodology

To identify potential socio-economic impacts and/or issues as a result of the proposed development, the assessment is supported by background research including information reviews and an analysis of demographic profiles as provided above.

### 8.11.4 Impact assessment

#### 8.11.4.1 Construction Impacts

The key potential social impacts that may result from construction of the proposed development include:

- Employment – there is the potential for employment to be generated during construction (temporary); and
- Amenity – construction of the proposed development has the potential to result in impacts to local amenities unless appropriate design and mitigation measures are adopted. In particular, there is the potential for air quality (dust), noise, traffic, and visual impacts during the construction phase.

There are no community facilities near the site such as schools, churches, childcare centres, open spaces or recreational facilities. The nearest residential properties are located on the east, south, and west of the site. (refer to **Table 32**)

The project aims to process 50,000 tpa of FOGO within the existing approved wood waste processing building. This facility is currently licensed to accept and process up to 150,000 tpa of forestry residues, urban wood residues, and non-putrescible organics. The 50,000 tpa FOGO will be part of this existing licensed volume, so there will be no increase in the total material processed at the site—only the types of materials will change.

No modifications to the existing shed are needed, as it is already approved for composting wood and vegetative waste. This application seeks to add 50,000 tpa of FOGO as an alternative feedstock. Technical studies conducted for the EIS have considered amenities impacts, and mitigation measures in **Section 8.14** address both the project's specific impacts and cumulative impacts alongside future developments. Consequently, the project is expected to have no impact on the surrounding residential properties.

The proposed development will have a positive employment impact during construction and is likely to create temporary positions during this period.

The potential for negative amenity impacts during construction will be significantly reduced by the implementation of appropriate environmental management controls guided by a construction environmental management plan as detailed in this EIS.

#### 8.11.4.2 Operational impacts

The proposed development is expected to positively impact employment during its operation. An Estimated Development Cost (EDC) of \$200,000 has been prepared for this application. Since the costs for construction, plant, and equipment were covered under DA-9/2021, the EDC for this application mainly consists of fees for consultants and technical specialists to prepare the EIS. Overall, the capital expenditure and associated economic benefits will contribute to and strengthen the local and regional economy.

The subject land is bordered by land similarly zoned for rural use to the north, south, east, and west. The surrounding area consists of scattered remnant vegetation and cleared land for agricultural grazing. Residential homes are primarily located to the north, south, and west of the site, with a commercial fish farm to the east.



The site is near residential properties, but operations will occur within the existing approved wood waste processing building, with no increase in staff. The site infrastructure will remain hidden from residences due to existing topography and vegetation. Transitioning to FOGO will not change the licensed processing capacity at the Tea Gardens Facility and is not expected to elevate odour or dust impact risks due to advanced reduction measures, including a fully enclosed system and biofilter for air emissions. FOGO will be processed for 14 to 28 days within the existing building, and all surface runoffs will be captured and reused onsite, resulting in improved long-term discharge conditions. The proposal is not affected by local or regional flooding and will not impact flooding conditions. Accordingly, the project will not have any amenities impact during its operation.

The potential for negative amenity impacts will be significantly reduced by the implementation of appropriate design features and environmental management controls guided by the operational environmental management plan.

The proposed development will increase the quantities of organic materials received and dispatched from the site. It will increase the processing capacity of organic waste into recycled materials, thereby reducing the amount of waste going to landfills and increasing the availability of recycled products. Utilisation of recycled materials contributes to the conservation of natural resources and biodiversity and is consistent with the principles of ESD.

Hence the proposed development will further assist the NSW government to achieve its goals to increase the diversion of waste from landfill disposal through the development of strategic recycling infrastructure and processing facilities, thus having a positive impact on waste minimisation and resource recovery in the region.

In addition to these social and economic benefits, the facility will service the increasing demand for waste recycling infrastructure in the Mid-North Coast region.

### 8.11.5 Mitigation and Management

Implementation of measures to reduce the potential for amenity impacts during construction and operation, as identified in the relevant chapters of the EIS and Statement of Commitments in **Section 8**.

In addition to the management and mitigation measures relating to amenity aspects, the operation will implement the following management and mitigation measures to ensure that development-related benefits are maximised, and adverse impacts minimised for the surrounding community.

- Proactively consult throughout the life of the development with those residents who could potentially be adversely impacted by the operations,
- Maintain a community complaints register and ensure that the existence of the number is advertised at the site entrance,
- Liaise with the Council in relation to any complaints received,
- Give preference when engaging new employees, where practicable, to candidates from surrounding areas over candidates with equivalent experience and qualifications from further afield, and
- Give preference, where practicable and cost-effective, to suppliers of equipment, services, or consumables located within surrounding communities.

### 8.11.6 Conclusions

The construction and operation of the proposed development will be of net benefit to the community. The potential for negative amenity impacts during construction will be significantly reduced by the implementation of appropriate environmental management controls guided by a construction environmental management plan.

## 8.12 FIRE AND INCIDENT MANAGEMENT

### 8.12.1 Introduction

This Fire and Incident Management section of the report has been prepared to satisfy the SEAR's, which requested the following is addressed:

***Fire and incident management – including:***

- *technical information on the environmental protection equipment to be installed on the premises such as air, water, and noise controls, spill clean-up equipment, fire management (including the location of fire hydrants and water flow rates at the hydrants), and containment measures.*
- *details of the size and volume of stockpiles and their arrangements to minimise fire spread and facilitate emergency vehicle access.*
- *the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives, and guidelines in the NSW Fire and Rescue guideline Fire Safety in Waste Facilities dated 27 February 2020.*

Technical specifications on the fire protection equipment for the proposed development has been prepared by Marline Pty Ltd (Marline), the specification reports are provided in **Appendix N**, a summary of the reports are provided below where relevant.

### 8.12.2 Methodology

The proposed development was assessed and designed in accordance with the requirements of the *National Construction Code (Volume 1) 2019* (BCA), the NSW Fire and Rescue guideline: *Fire Safety in Waste Facilities*, 2020 and relevant Australian Standards and Codes.

The size and volume of stockpiles and their arrangements was estimated based on the storage capacity, as defined in the site layout drawings.

### 8.12.3 Existing Environment

As discussed in **Section 8.8.2**, there are currently three fire-fighting water tanks on site, each with a capacity of 144 thousand litres and Storz fitting such that they are compliant with *PBP* requirements. There are also three existing dams on the site with estimated capacity of 9.2ML (located at the northern part of the development, 6.2ML (located at the south-western part of the development) and 5.2ML (located at the southern part of the development).

### 8.12.4 Impact Assessment

#### 8.12.4.1 Fire Protection Equipment

Fire management infrastructure for the proposed development has been designed by Marline in accordance with relevant building codes and standards as follows:

- National Construction Code (NCC) and all relevant Australian Standards including:
  - *AS 1603 Automatic fire detection and alarm systems.*
  - *AS 1670 Automatic fire detection and alarm systems – System design, installation, and commissioning.*
  - *AS 2118 Automatic fire sprinkler systems.*
  - *AS 2419 Fire hydrants.*
  - *AS 2441 Fire hose reels.*

- AS 2444 Portable fire equipment – Selection and location.
- AS 4428.1 Control and indicating equipment: Fire.
- Fire Safety in waste facilities, 2020, Fire and Rescue NSW.
- Access for fire brigade vehicles and firefighter's, 2019, Fire and Rescue NSW.

The fire protection equipment to be installed for the proposed development is discussed below. Details of the proposed air, water, noise and spill risk and mitigation measures are provided in the respective sections within this EIS.

### **Fire Detection and Alarm**

The wood waste building will be equipped with the following fire detection and alarm system in accordance with AS 1670.1.

- Fire fan control and indication panels (FFCP).
- Fire alarm shutdown trip.
- Fire alarm bell and strobe.
- Sound system - loudspeakers.
- Magnetic door holders
- Aspirated smoke detectors.

### **Fire Suppression System**

The fire suppression system for the proposed development consists of fire hydrants, fire hose reel, fire extinguishers and a sprinkler system. Details of the fire suppression system are provided in **Table 50** below.

**Table 50: Fire Suppression System**

Item	Description
Fire hose reels	<ul style="list-style-type: none"> <li>● 3 x Fire hose reels to be installed within a wood waste building not more than 4m from an exit. The fire hose reel system will be connected to the fire hydrant supply pipework with a 500kPA pressure limiting valve.</li> </ul>
Fire extinguishers	<ul style="list-style-type: none"> <li>● Fire extinguishers will be housed in the wood waste building to aid in suppressing small fires.</li> </ul>
Fire sprinkler system	<ul style="list-style-type: none"> <li>● A fire sprinkler system will be installed in the wood waste building which will consist of the following:</li> <li>● Sprinkler alarm valve sets</li> <li>● Fire sprinkler heads &amp; associated pipe work</li> </ul>
Hydrant system	<ul style="list-style-type: none"> <li>● The hydrant system will consist of the following:</li> <li>● Water storage tanks</li> <li>● Diesel fire pump sets and associated ancillary equipment</li> <li>● A fire brigade booster and suction point</li> <li>● Hydrant ring main</li> <li>● Double pillar fire hydrants</li> </ul> <p>The location of the fire hydrant system is shown in <b>Appendix N</b>.</p>



Item	Description
Fire water infrastructure	<ul style="list-style-type: none"> <li>2 x stored fire service water tanks to be located toward the northern area of the site as shown in <b>Appendix N</b>.</li> <li>Firewater generated from dousing a fire within the wood waste processing building would be captured within the leachate water management system which would be capable of containing the hydraulic demand of the fire suppression systems. Outside the wood waste building, fire water would be captured by the stormwater system.</li> </ul>
Fire vehicle access	<ul style="list-style-type: none"> <li>Fire Vehicles will gain access to the site and main boosters from the main entry driveway. Access to the wood waste building is available from all aspects.</li> </ul>

Technical specifications for the fire protection measures are summarised below in **Table 51** and included in **Appendix N**.

**Table 51: Technical Specifications of Fire Management System**

Item	Specification
Fire Hydrant Booster Assembly	<ul style="list-style-type: none"> <li>Drafting point containing 2 x 65mm "Storz" outlet and 1 x 150mm large bore suction point.</li> <li>150mm H pattern booster assembly.</li> <li>FIP Mimic panel.</li> <li>Booster compliant with the current fire hydrant standard AS2419.1-2021.</li> <li>Location compliant with the requirement to be within 10m of a protected building.</li> </ul>
Fire Hydrant Pumps	<ul style="list-style-type: none"> <li>Pre-packaged fire service booster pumps. 2 x diesel fire pumps with a duty of 20L sec @850kPa.</li> </ul>
Fire Hydrant System	<ul style="list-style-type: none"> <li>150mm fire ring main.</li> <li>External double pillar hydrants compliant with AS2419.1-2021.</li> </ul>
Sprinkler Control Valve and pipework	<ul style="list-style-type: none"> <li>1 x sprinkler control valve set to service wood waste building.</li> <li>150mm fire sprinkler pipework</li> </ul>
Sprinklers	<ul style="list-style-type: none"> <li>OH3 fire sprinkler design – roof slope &lt;6 degrees, operational heads at 1L/sec.</li> </ul>
Fire Hose Reels	<ul style="list-style-type: none"> <li>5 x 36m fire hose reels installed not more than 4m from an exit in the wood waste building.</li> <li>Connected to the fire hydrant supply pipework with a 500kPa pressure limiting valve.</li> </ul>
Water Supply Tanks	<ul style="list-style-type: none"> <li>2x stored fire service water tanks. Each tank will have an effective capacity of 200,000L. Total combined capacity = 400,000L</li> </ul>
Fire Extinguishers	<ul style="list-style-type: none"> <li>Fire extinguishers will be housed within the wood waste building to suppress small fires. Fire blankets will also be made available in the lunchroom.</li> </ul>
Fire detection and alarm	<ul style="list-style-type: none"> <li>A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 would be installed for the wood waste building.</li> </ul>

#### 8.12.4.2 Stockpile Size, Volume and Arrangement

The estimated size and volume of potentially combustible material stockpiles, for the proposed development, are identified below in **Table 52** and discussed further below including stockpile arrangements and fire risk.

**Table 52: Storage Capacity of Materials**

Storage Area	Material	Volume Stored (t)
Wood waste building – feedstock receival zone	Temporary stockpile of feedstock	5,000
External maturation and blending pad	Stockpiles of maturing compost awaiting blending and transfer to product storage bays	6,000
Product storage bays	Landscaping supplies - soil conditioner, composted mulch etc	2,000

Fires at composting facilities can occur if internal heat increases to ignition point. Conditions that may lead to spontaneous combustion include dry material, limited or low air flow, sustain period of time to allow temperature to increase, large, insulated piles and biological activity.

FOGO generally has a high moisture content and poses a low fire risk. However, it is combustible and, under the right conditions, can self-ignite. FOGO received onsite will be unloaded within the fully enclosed wood waste building and will be processed soon after arrival which substantially reduces the chance of self-ignition. Up to approximately 5,000t of FOGO will likely be stored within the wood waste building at any one time.

Compost can combust under certain conditions. ANL has developed a comprehensive operations plan for the management of the compost stockpiles, which includes frequent monitoring and regular turning. The stockpiles (including finals products) will be located on a concrete hardstand with a fire hose system adjacent to the stockpiles to assist with firefighting in the event of a fire. This will allow any fire to be quickly extinguished, or managed until the fire brigade appliances arrive. Full access to the internal areas of the site is provided for emergency vehicles.

#### 8.12.4.3 NSW Fire and Rescue Guideline

The proposed development is identified as a composting facility. The fire safety in waste facilities guideline does not apply to any waste facility, or areas of, that are being used for composting, including in-vessel, green waste and anaerobic digestion. However, where possible provisions of the guideline have been considered and are shown in **Table 53**.

**Table 53: Fire Safety in Waste Facilities Guideline**

Performance Requirements	Comments
Firefighting intervention	<ul style="list-style-type: none"> <li>Access to the internal areas of the site is provided for emergency vehicles.</li> <li>Access to hydrants is achieved.</li> <li>Hydrants are accessible on site along with fire water tanks and pumps.</li> </ul>
Fire hydrant system	<ul style="list-style-type: none"> <li>A fire hydrant system will be installed to Australian Standard AS 2419.1 and provide coverage for both internal and external stockpiles</li> <li>Hydrants located around perimeter of site, not within 10m of any stockpile. Proposed hydrant layout included in <b>Appendix N</b>.</li> <li>A fire brigade booster connection is installed within sight of the designated site entry point.</li> </ul>
Automated fire sprinkler systems	<ul style="list-style-type: none"> <li>The fire suppression system to Australian Standard AS 2441 will provide for automated fire suppression.</li> </ul>
Fire detection and alarm systems	<ul style="list-style-type: none"> <li>A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 would be installed for the wood waste building.</li> </ul>
Fire water run-off containment	<ul style="list-style-type: none"> <li>Firewater generated from dousing a fire within the wood waste processing building would be captured within the leachate water management system which would be capable of containing the hydraulic demand of the fire suppression systems. Outside the wood waste building, fire water would be captured by the stormwater system.</li> </ul>
Bush fire prone land	<ul style="list-style-type: none"> <li>The facility complies with the aim and objectives of <i>PBP 2019</i>. There is no requirement for any construction to a BAL standard. Refer to bushfire assessment <b>Section 8.8</b>.</li> </ul>
Stockpile movement	<ul style="list-style-type: none"> <li>Compost will be monitored.</li> </ul>
External stockpiles	<ul style="list-style-type: none"> <li>Waste storage areas comply with stockpiling requirements. Storage areas allow for double-sided access.</li> </ul>
Internal stockpiles	<ul style="list-style-type: none"> <li>Internal stockpiles are not located in the proximity of unnecessary ignition risks.</li> <li>Building egress points would not be obstructed by stockpile.</li> <li>Stockpile boundary limits would be clearly marked.</li> </ul>
Operations plan	<ul style="list-style-type: none"> <li>Will be provided to all staff prior to operation.</li> </ul>
Workplace fire safety	<ul style="list-style-type: none"> <li>Workplace fire safety will be addressed in the Operational Environmental Management Plan.</li> </ul>

### 8.12.5 Mitigation and Management

The following mitigation and management measures will be implemented to address fire safety:

- A fire hydrant system to comply with AS2419.1-2005 and FRNSW waste facilities guideline.
- Automatic fire suppression system in accordance with AS2118.1-2017 & FRNSW waste facilities guideline.
- Fire hose reel system in accordance with AS2441-2005.
- Portable fire extinguishers throughout the building in accordance with AS2444-2001.
- Exit and emergency lighting in accordance with AS2293.1-2018.

- Fire detection and alarm system.
- Smoke hazard management system.
- Two-way radio systems for all staff within the facility to aid in emergency notification and evacuation.
- Adoption of Emergency Control Procedures including the development of an Emergency Response Plan and Emergency Management Plan, along with risk minimisation strategies.
- Staff training in emergency response, including:
  - Use of firefighting equipment
  - Fire awareness
  - Emergency evacuation procedures
  - Location of fire systems and firefighting equipment.
- Ongoing consultation and communication with Fire and Rescue NSW

### 8.12.6 Conclusion

An assessment was conducted of the proposed development against the requirements of the fire safety provisions of the BCA and FRNSW's Fire Safety Guideline: fire safety in waste facilities. Mitigation of fire risk has been incorporated into the design and layout of the proposed project and will be included in the Environmental Management Plan for the site.

## 8.13 HAZARDS AND RISK

### 8.13.1 Introduction

Preliminary risk screening has been undertaken to determine whether the proposed development is 'potentially hazardous' within the guidelines of NSW State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 3 and Applying SEPP 33 (DoP, 2011).

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).

The assessment has been prepared to satisfy the SEARs, which requested the following is addressed:

***Hazards and Risk – including:***

- *A preliminary risk screening completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 3 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).*

A full summary of the SEARs requirements (including agency responses) is included within **Appendix A**.

The preliminary risk screening involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site with respect to storage locations as well as transported to and from the site, and to determine if a more detailed assessment is required.

Where SEPP 33 identifies development as potentially hazardous and/or offensive, developments are required to undertake a Preliminary Hazard Analysis (PHA) to determine the level of risk to people, property, and the environment at the proposed location and in the presence of controls.



If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, then the development is classified as a 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as an 'offensive industry' and may not be permissible within most land use zones in NSW. Under SEPP 33 an 'offensive industry' is categorised as one which results in a significant level of offence, such as noise emissions and air quality impacts which have been assessed as part of this EIS in **Section 8.2** and **Section 8.3** respectively.

### 8.13.2 Existing Environment

The development site is legally described as Lot 1 DP714149 and is located on the southern side of Myall Way, adjacent to the Pindimar Road intersection. The site fronts both Myall Way and Pindimar Roads. The subject site has an area of approximately 42.47 ha and falls from the northeast to the southwest by some 10 m.

The site contains an approved landscape supply operation (and bagging complex), waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, aerated composting platform, site office, and managers residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

A full site description is provided in **Section 2**.

### 8.13.3 Methodology

The approach to the PRS is to identify the quantity of each dangerous goods class to be stored on site and to compare it to the storage screening threshold in *Table 3 of Applying SEPP 33 (NSW Planning, 2011)*.

The number of generated traffic movements for significant quantities of dangerous goods to and from the site is also considered, with the number of traffic movements compared to the thresholds in *Table 2 of the SEPP 33 guideline*.

The dangerous goods to be stored on the site were grouped into their respective Australian Dangerous Goods (ADG) classes.

### 8.13.4 Impact Assessment

SEPP 33 sets out a process for screening potentially hazardous materials that are stored on site as part of a proposed development.

Potential risk typically of holding certain types of hazardous materials on site depends on:

- The properties of the substance(s) being handled or stored,
- The conditions of storage or use,
- The quantity involved,
- The location with respect to the site boundary, and
- The surrounding land use.

Risk screening needs to be undertaken as part of the SEPP 33 guidelines based on an estimate of the consequences of fire, explosion, or toxic release from material(s) being handled. It takes into account information from the proponent on the properties of the materials, quantity, type of storage or use, and location. A risk screening analysis for the proposed development is given below, **Table 54** provides a summary of the potential hazardous materials held on site as part of the development.

#### **Wood**

The following wood materials are currently approved to be processed within the approved wood waste building:





- Forestry and sawmill residues – including untreated and uncontaminated plant materials from forestry operations and sawmills such as bark, wood chip, sawdust, and wood fibre.
- Urban wood residues – including untreated, unpainted, and uncontaminated urban derived timber and wood material such as off-cuts, saw dust, wood shavings, and pallets.
- Non-putrescible organics – including timber, garden trimmings, agricultural organics, forestry and crop materials, and natural fibrous organic and vegetative materials.

Wood is not classified as dangerous goods according to the Dangerous Goods Code. However, it can combust if exposed to an ignition source. Saw dust, in particular, is combustible.

The materials are stored in a dry state, with water used as a dust suppressant. The turnover of material in the storage areas is high, which reduces the chance of heat build-up in stored materials.

Strict procedures are currently in place at the premises to avoid any hot work during operations and smoking is strictly prohibited in all parts of the site.

### **Food Organics and Garden Organics (FOGO)**

The building to be utilised for the receipt and composting of FOGO is the existing approved wood waste building. The building will continue to be used for the purpose of processing wood waste, including non-putrescible vegetative waste from agriculture, silviculture, or horticulture, however with the addition of FOGO.

FOGO is not classified as a dangerous good. However, it is combustible and, under the right conditions, can self-ignite. Up to approximately 5,000 tonnes of FOGO will likely be stored on the site at any time.

FOGO received onsite will be unloaded within the fully enclosed wood waste building and will be processed soon after arrival which substantially reduces the chance of self-ignition.

### **Compost**

Compost is not classified as a dangerous good under the Dangerous Goods Code. However, it can combust under certain conditions.

ANL has developed a comprehensive operations plan for the management of the compost stockpiles, which includes frequent monitoring and regular turning. The stockpiles will be located on a concrete hardstand with a fire hose system adjacent to the stockpiles to assist with firefighting in the event of a fire. This will allow any fire to be quickly extinguished or managed until the fire brigade appliances arrive.

### **Diesel**

Diesel with a flashpoint < 60 °C is classified as a Dangerous Good Class 3 Packaging Group 3 (flammable liquids). Diesel fuel will be stored in a dedicated fuel storage area for the purpose of re-fuelling plant and equipment onsite.

The risks associated with this proposed development include diesel storage and use. The use of diesel will be in accordance with the requirements of AS 1940: 2017 - *The storage and handling of flammable and combustible liquids*. The diesel stored in the fuel storage area will be appropriately bunded to ensure any spills are contained.

A self-bunded diesel fuel tank with a maximum volume of 81,500 L for the storage of diesel fuel is located onsite to re-fuel mobile plant. The tank has a safe fill level of 77,425 L as recommended by the manufacturer. The self-bunded container has dimensions of 14,630 mm length, 2,438 mm wide and 2,896 mm high.

The diesel tank is located directly behind the site workshop which is shown on **Figure 8**. The tank is located in the south-western extent of the operations, which is at least 350 m from the western boundary and 460 m from the southern boundary.

The site is expected to use approximately up to 25,000 L of diesel fuel per fortnight to service the on-site equipment. Refilling of the tank occurs once a fortnight, depending on need, in a single semi-trailer (delivering maximum of 30,000 L for each load).

Across an entire year, the tank will be refilled a total of 26 times with a total annual volume of diesel expected to be up to 650,000 L.

A development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the annual or weekly cumulative vehicle movements shown in Table 2 of the Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. These thresholds for potentially hazardous development are >60 (diesel) deliveries per week or >1,000 (diesel) deliveries per annum. As the proposed delivery schedule is only once per fortnight, the use of the self-bunded fuel tank is not considered potentially hazardous development.

An assessment of the self-bunded diesel tank has been performed under SEPP33 with specific reference to Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. Risk screening was performed according to Section 7 of these guidelines (specifically under Table 1, Table 3 and Figure 9 of the guidelines). Under these guidelines, development considered as 'potentially hazardous' needs to be more fully assessed through a Preliminary Hazardous Assessment to determine whether the development poses an unacceptable risk to neighbouring land uses and may not be appropriate development.

Given the proposed 77,425 L (≈77 tonne) above ground diesel storage tank is located large distances from site boundaries, and that the neighbouring land use closest to the proposed tank location is not sensitive, the development and tank capacity falls outside the thresholds for 'potentially hazardous development', as per the SEPP33 Guidelines (this occurs when the tank is positioned <10 m to a boundary). As a consequence, a Preliminary Hazard Assessment is not required.

**Table 54: Risk Screening Analysis of Potentially Hazardous Materials**

Material	Storage Location	Dangerous Goods Class <sup>1</sup>	Packing Group <sup>2</sup>	Maximum Quantity on Site	Screening Method <sup>3</sup>	Threshold <sup>4</sup>	Notes
<b>Wood Waste</b>	Temporarily Stockpiled in wood waste building	n/a	n/a	Up to ~5,000 tonne (maximum storage capacity of 5,000 tonne of a combination of wood waste and FOGO)	n/a	n/a	Not classified as a dangerous good
<b>FOGO</b>	Temporarily Stockpiled in wood waste building	n/a	n/a	Up to ~5,000 tonne (maximum storage capacity of 5,000 tonne of a combination of wood waste and FOGO)	n/a	n/a	Not classified as a dangerous good
<b>Compost</b>	Stockpiled on Maturation pad	n/a	n/a	Up to ~6,000 tonne	n/a	n/a	Not classified as a dangerous good

Material	Storage Location	Dangerous Goods Class <sup>1</sup>	Packing Group <sup>2</sup>	Maximum Quantity on Site	Screening Method <sup>3</sup>	Threshold <sup>4</sup>	Notes
<b>Diesel</b>	Self-bunded storage container located directly behind site workshop	3	III	77,425 L	Figure 9	10m to a boundary	Below threshold based on quantity stored and location of storage (>10 m from lot boundary)

<sup>1</sup> Class 2.1 Dangerous Goods are classified as 'flammable gases'. <sup>3</sup> Screening method is the methodology used to assess dangerous goods in the NSW Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. <sup>4</sup> Where dangerous goods are stored on-site which exceed the nominated thresholds as per Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*, the proposed development is considered to be hazardous and requires detailed assessment under SEPP 33.

Preliminary screening concludes that under SEPP 33 the Project is not considered either 'hazardous' or 'offensive'.

### 8.13.5 Mitigation and Management

While the PRS for the proposed facility has determined that the development is not considered a hazardous or offensive development, the following controls will still be implemented:

- All mobile plant and equipment will be fitted with fire extinguishers,
- An Emergency Response Plan will be prepared and implemented for the facility,
- All staff on site will be appropriately trained in the handling of dangerous goods, and
- Flammable and combustible liquids will be stored in accordance with AS1940.

### 8.13.6 Conclusions

The SEPP 33 screenings for storage and transportation of dangerous goods indicate that the development is not considered a hazardous or offensive development in accordance with the guidelines. As such a Preliminary Hazard Assessment is not required.

## 8.14 CUMULATIVE IMPACTS

The cumulative assessment considers the potential for the impacts from the development to combine with impacts from potential future developments in the vicinity of the site. This may lead to new or more significant impacts being identified compared to the development-specific assessment, and where appropriate, additional mitigation measures should be recommended.

The subject land is bordered by similarly zoned rural land to the north, south, east, and west. The area predominantly features scattered patches of remnant vegetation and cleared areas for agricultural grazing. Residential homes are mainly situated to the north, south, and west of the site, while a commercial fish farm is located to the east. Given the existing zoning around the site, there is limited potential for further land subdivision and residential development in the area.

A review of the Mid Coast Council DA tracker did not identify any proposed projects of a similar nature to the proposed development within the study area (i.e. within 5km of the subject site). Similarly, no proposed projects were identified that may have the potential to generate significant levels of heavy-vehicle traffic along the haul route between the site entrance and the Pacific Highway.



The cumulative impacts of the development have been considered in technical studies undertaken as part of the EIS. The mitigation measures proposed in each of the specialist assessments in **Section 8.15** have also been designed to ameliorate potential impacts associated with the development in its own right as well as minimising overall cumulative impacts of the development when considered alongside other future developments.

The potential cumulative impact of the development is considered and summarised in **Table 55** below.

**Table 55: Summary of the Cumulative Impacts**

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Traffic and Access	<p>The site is located on the southern side of Myall Way, near the Pindimar Road intersection, and is bordered by rural land to the north, south, east, and west. The area features remnant vegetation, cleared agricultural grazing areas, residential homes to the north, south, and west, and a commercial fish farm to the east. Primary access roads are Myall and Pindimar Roads, with Myall Road intersecting the Pacific Highway 900m east of the site.</p> <p>The Project aims to compost up to 50,000 tpa of FOGO within the existing wood waste processing building, reducing wood waste to 100,000tpa, and maintaining the total organic intake at 150,000tpa. This supports regional NSW's resource recovery infrastructure and helps meet the target of diverting all household food and garden organics from landfills by 2030.</p> <p>Capacity analysis of nearby intersections shows:</p> <ul style="list-style-type: none"> <li>• All intersections operate at Levels of Service "A."</li> <li>• No road improvements or intersection upgrades are needed.</li> </ul> <p>The Project will not change staff numbers, operating hours, or annual organics intake, thus not affecting traffic or parking demands. Therefore, it will not impact road network capacity, vehicular access, or parking/loading requirements.</p>	<b>Section 8.1</b>
Noise and Vibration	<p>The site is located at the junction of Pindimar Road and Myall Way, with the nearest noise-sensitive properties being residential dwellings to the east, south, and west.</p> <p>A noise and vibration assessment for the project concludes that the proposal will not introduce additional on-site noise sources or increase vehicle traffic on-site or on the road.</p> <p>The proposal simply involves adding FOGO feedstock to the existing wood waste material currently handled by the site. The overall site tonnage of 150,000tpa will remain unchanged, with an allocation of 50,000tpa for FOGO and 100,000tpa for wood waste.</p> <p>The acoustic controls previously advised for the site under DA-9/2021, which are part of that approval, are retained for this assessment. No additional controls are required to maintain acoustic compliance under the current proposal.</p>	<b>Section 8.2</b>



Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Air Quality	<p>The key potential sources of dust and odour emissions associated with the activities include the receival processing pathway and material composting within the wood waste building via the Aero-Sorb Platform. Due to the facility's remote location and the nature of the proposed composting activities, no significant issues were identified concerning emissions of greenhouse gases, odour, or dust. As previously documented, the proposed FOGO composting operations at the Tea Gardens Facility will be conducted within a controlled building environment. All process and building ventilation air will be extracted and treated through a biofilter system before being released into the atmosphere. This air emissions control protocol and technology align with current industry best practices and the Composting Guidelines, significantly mitigating odour and dust emissions to the greatest extent practicable.</p> <p>The biofilter is designed to remove most, if not all, of the original odour characteristics from the foul air stream. Consequently, the odour level in the treated air will primarily depend on the extent of the 'earthy/musty' odour picked up from the composting biofilter medium. TOU's experience indicates that a 'biofilter' odour is never problematic, even at these levels.</p> <p>Results from the air quality and odour assessment suggest that negligible or even improved odour and dust emissions are expected at the Tea Gardens Facility compared to current operations. The transition to FOGO will not change the current licensed processing capacity at the Tea Gardens Facility and is not anticipated to elevate odour and dust impact risks, based on the reduction measures adopted for the initial FOGO composting phase. Implementing a fully enclosed and engineered environmental operating condition, augmented with a purpose-built biofilter system for air emission treatment, reflects best practices for the initial phase of FOGO composting in Australia. This assessment is based on processing the FOGO within the existing approved wood waste building for a minimum period of 14 days and up to 28 days, depending on processing conditions.</p>	Section 8.3

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Surface Water	<p>This application does not require changes to the existing approved shed, which is already designed and approved for composting wood and vegetative waste. It seeks only to include 50,000tpa of FOGO as an alternative feedstock. Since the proposal is within the existing development footprint, significant erosion and sedimentation risks are unlikely. No construction sedimentation basins are needed; standard erosion control measures like silt fencing and sandbagging will suffice. Existing silt traps and storage dams will act as sedimentation basins. The site, located at the top of the catchment, has no external runoff entering the operational area. Surface runoff will flow through adjacent properties to Station Creek, Bundabah Creek, and eventually into North Arm Cove (Port Stephens), approximately 2.6 km downstream.</p> <p>The Port Stephens Design Flood Levels Climate Change Review indicates a 2100 100-year flood level at Bundabah (North Arm Cove) of 2.7m AHD. With site levels starting at 15m AHD and the Wood Waste Processing building at 31.8m AHD, the proposal is not expected to impact local or regional flooding.</p> <p>Implementing the mitigation measures described in the existing EPL conditions will ensure the proposed extension does not significantly affect the surface water regime. The site operates under active management, preventing runoff from leaving the development footprint. Captured surface runoff is stored for on-site reuse, and a slight increase in internal water demand will improve long-term site discharge conditions. The proposal will not impact local or regional flooding.</p> <p>The facility will continue to follow the current EPL requirements, including surface water monitoring. The Surface and Groundwater Management Plan and other environmental management plans will guide operations. A detailed Soil and Water Management Plan will be prepared for the construction stage before releasing the Construction Certificate, as the construction footprint exceeds 2,500 sq.m.</p>	Section 8.4
Aboriginal and Historic Heritage	<p>The project area is heavily disturbed and has a long history of development, with works carried out since 1932.</p> <p>The Aboriginal due diligence and historic heritage assessment prepared for the project concluded that no Aboriginal objects were identified, and there is no evidence to suggest their presence in the project area based on the conducted survey. Additionally, it is highly unlikely that significant historic items will be discovered within the study area, as no landforms with identified archaeological sensitivity are present. Therefore, the proposed work is unlikely to harm Aboriginal cultural heritage items or sites. Given that the study area is assessed as not having a likelihood of containing any historical heritage items, the proposed development would not harm heritage objects.</p>	Sections 8.5 and 8.6

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Biodiversity	<p>The site is situated within the NSW North Coast Bioregion and specifically within the Karuah Manning Sub-bioregion. It also falls within the Newcastle Coastal Ramp NSW Landscape and is located in the Mid Coast Local Government Area (LGA).</p> <p>Apart from the existing footprint of ANL operations, the surrounding area is predominantly undeveloped, covered with native vegetation primarily consisting of open forest. The invasive <i>Pinus elliotii</i> (Slash Pine) is commonly found in certain parts of the study area.</p> <p>The Proposal does not involve any additional disturbance beyond the previously approved footprint. Ecological investigations supporting the proposal confirm that there will be no impact on threatened species, endangered ecological communities, critical habitat, or endangered populations within the previously disturbed area due to the project.</p> <p>In summary, the Proposal is expected to have minimal impact on the life cycle of any addressed threatened species, endangered populations, or endangered ecological communities, thereby not posing a risk of local extinction.</p>	Section 8.7
Bushfire	<p>The site is designated as bushfire-prone land, encompassing Vegetation Category 1 land to the north and south, with Vegetation Buffer lands running through the centre of the site.</p> <p>There are no changes proposed to the footprint of the approved wood waste processing shed, nor any reduction in setbacks to existing or proposed vegetation due to this proposal. The project has been evaluated in accordance with the NSW Rural Fire Service Planning for Bushfire Protection Guidelines (2019) and is deemed fully compliant. Consequently, the proposal will not increase the risk related to bushfires. However, mitigation measures are recommended to ensure access for emergency evacuation and adequate water supply.</p>	Section 8.8

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Visual Amenity	<p>The Project does not require any additional infrastructure or changes to the existing approved wood waste processing shed, already designed and approved for composting wood and vegetative waste. The varied topography and remnant vegetation naturally screen the project infrastructure.</p> <p>A visual impact assessment focused on sensitive receivers, such as private residences and major travel routes. The closest sensitive receivers are 120 meters west of the Project. The assessment concluded that the site's infrastructure will not be visible from residences or major routes due to the screening effects of topography and vegetation. Additionally, the low height of the site's infrastructure and equipment further minimizes visual impacts.</p> <p>Therefore, the proposal will not result in any additional visual impacts for travellers on these routes, as views are screened, and no new building infrastructure is proposed.</p>	<b>Section 8.9</b>
Waste Management	<p>The site features an approved landscape supply operation, a waste wood and timber processing facility with a wood processing shed, product stockpile areas, concrete hardstand areas, an aerated composting platform, a site office and manager's residence, a weighbridge, an onsite water supply, water quality management systems, and extensive perimeter landscaping.</p> <p>Since the wood waste building is already designed to process wood and vegetative waste, no modifications are needed, and the proposed development will not generate demolition or construction waste. Waste from the expanded facility will be managed according to the waste hierarchy, supporting the Waste Avoidance and Resource Recovery Act 2001 to maximise landfill diversion.</p> <p>The project will involve receiving, inspecting, processing, and storing waste wood materials and FOGO, with the resulting products sold as landscape supplies. All operational waste will be managed using the waste hierarchy, with unavoidable waste classified and disposed of per the Waste Classification Guidelines (NSW EPA, 2014). Employee-generated waste will be separated to recover recyclable materials and divert waste from landfills, while processing waste, including leachate, will be captured and reused in processing activities.</p>	<b>Section 8.10</b>

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Socio-Economic	<p>There are clear socio-economic and community benefits associated with the Project. The Project assists the NSW Government in achieving an increased diversion of waste from landfill through the provision of strategic infrastructure and processing capacity.</p> <p>At the micro level, the proposed development will result in employment creation during both the construction and operation phases.</p> <p>Mitigation measures will also ensure that any amenity or environmental impacts associated with the expansion are properly managed.</p>	<b>Section 8.11</b>
Fire and Incident Management	<p>Fire safety design has been undertaken to ensure in the event of a fire there is adequate fire protection in place. Incident management will be undertaken in accordance with existing site incident response protocol.</p>	<b>Section 8.12</b>
Hazard and Risk	<p>A Preliminary Risk Screening (PRS) under State Environmental Planning Policy No. 33 Hazardous and Offensive Development (SEPP 33) has been undertaken for the development. The screening indicates that the development is below the SEPP thresholds and therefore is not considered a hazardous or offensive development in accordance with the guidelines.</p>	<b>Section 8.13</b>

## 8.15 STATEMENT OF COMMITMENTS

The mitigation measures, monitoring activities, and management strategies outlined in **Section 8** above will be implemented for all activities associated with the proposed facility. **Table 56** below details the key commitments proposed in this EIS to effectively mitigate and manage the potential environmental impacts of the development.

**Table 56: Consolidated Statement of Commitments**

Summary of Commitments	Section in the EIS
<b>Traffic and Transport</b>	
<ul style="list-style-type: none"> <li>The proposed development seeks to receive and compost up to 50,000tpa of FOGO within the existing approved wood waste processing building while reducing the amount of wood waste materials to 100,000tpa to keep the total received tonnages of organics at 150,000tpa. Consequently, there will be no increase in the annual intake of organics.</li> <li>The purpose of the development is to service the increased need and demand for resource recovery infrastructure in regional NSW. This infrastructure would assist local councils and the NSW Government to meet the target of having all household food and garden organics diverted from landfill in all LGAs by 2030.</li> <li>The SIDRA capacity analysis of the nearby intersections located around the perimeter of the site indicates that:</li> </ul>	<b>Section 8.1.5</b>



<ul style="list-style-type: none"> <li>- all intersections operate at <i>Levels of Service "A"- good operation</i>, and</li> <li>- no road improvements or intersection upgrades would be required as a consequence of the development proposal</li> </ul> <ul style="list-style-type: none"> <li>• The Project will not alter existing staff numbers, operating hours, or the number of organics received onsite per year. Consequently, no significant changes are expected in approved traffic and parking demands generated by the site. Therefore, the Project will not have any unacceptable implications in terms of road network capacity, vehicular access, or off-street parking/loading requirements.</li> </ul>	
<b>Air Quality (Odour and Dust)</b>	
<p><b><u>Air Quality and Odour Analysis and Findings</u></b></p> <ul style="list-style-type: none"> <li>• The proposed FOGO composting operations at the Tea Gardens Facility will be conducted within a controlled building environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practices and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable.</li> <li>• The biofilter will be designed to remove the bulk, if not all, of the original odour character in the foul air stream. As such, the odour level in the treated air will mostly depend on the extent of the 'earthy/musty' odour picked up from the composting biofilter medium. TOU's experience is that a 'biofilter' odour is never problematical, even at these levels.</li> <li>• Of the 50,000tpa of FOGO to be received, only 5000t will be FO.</li> </ul> <p>Based on the operational evaluation analysis and findings documented in the AQOIA, the following remarks are made in the context of the proposed FOGO processing operations at the Tea Gardens Facility:</p> <ul style="list-style-type: none"> <li>• The initial composting phase of the FOGO processing will be conducted in a controlled environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practices and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable.</li> <li>• The AQOIA has considered the impact of transitioning to 50,000tpa of FOGO and the existing approved wood waste building. Given that an OCS will be retrofitted to the existing approved wood waste building, the proposed infrastructure configuration and established waste management operations are adequate to effectively manage any future odour generation risk from the proposed FOGO operations.</li> <li>• The proposed containment of the initial composting phase within the existing approved wood waste building and covering of the biofilter system is anticipated to result in further mitigating odour emissions through minimisation from ingress of rainfall on the maturation stockpile area, enhancing the management of moisture control during the initial FOGO composting period, and minimise surface water and leachate generation from the initial FOGO composting processing area.</li> <li>• The proposed OCS to existing approved wood waste building for the initial composting phase is commensurate with the expected gradual rate of the transition to FOGO over several years. The building design allows for effective containment and ventilation adjustments to address potential organic shifts in the FOGO waste stream due to evolving regulatory, community, and social</li> </ul>	<p><b>Section 8.3.5</b></p>

factors in the future. The biofilter-based OCS will be suitable for all FOGO and organic waste processing scenarios in the long term; and

- The full enclosure and capture of FOGO composting emissions in the initial phase offers a practical and reasonable pathway for a transition to FOGO that will maintain or possibly improve the amenity from an odour and dust emissions perspective compared to the existing operating conditions at the Tea Gardens Facility.

In addition to the above, the following recommendations are made as part of proactive and prudent measures for the management of odour and dust emissions from the Tea Gardens Facility under the proposed FOGO transition:

- Development of a Construction Environmental Management Plan (CEMP) for any construction and demolition works required as part of the proposed FOGO transition (where applicable). A CEMP outlines actions that should be implemented to prevent, control, and mitigate environmental and human impacts associated with the any construction and demolition works. It also outlines protocols and policies for managing, monitoring, reporting, and responding to any potential environmental issues. As a minimum, the CEMP will need to consist of the reduction of airborne particles/dust emissions during construction and demolition works, dust suppression during dry weather, dust suppressants, windbreaks, covers, soil erosion, and other effective techniques to prevent and mitigate the generation and dispersion of dust as part of the proposed FOGO transition at the Tea Gardens Facility.
- Update the site-specific Air Quality & Odour Management Plan (AQOMP) to reflect the proposed FOGO transition at the Tea Gardens Facility. As a minimum, the updated AQOMP should document the hierarchy of controls in the form of, but not limited to, engineered, administration, and/or management practices, under the proposed FOGO transition, including:
  - Identification of critical air quality and odour emissions risk and control points.
  - An outline of how the production and migration of air pollutants (such as odour and dust) is minimised at the Tea Gardens Facility, including design (where applicable) and operational practices.
  - Standard operating procedures, equipment, material of construction, and management practices employed within the Tea Gardens Facility to anticipate the formation of odours and minimise their release.
  - An outline of the key staff and responsibilities with respect to air quality and odour management.
  - An outline of the reporting requirements with respect to air quality and odour.
  - The operation and maintenance of the biofilter-based OCS including the monitoring of humidity, pressure and temperature, and
  - An outline of future odour and dust strategies, as part of a long-term trigger action and response plan.
- Undertake a site-specific odour and dust validation assessment following the transition and commencement of FOGO processing at the Tea Gardens Facility. This will ensure the outcomes align with that documented in the AQOIA. This can be used as a basis for further mitigation and management measures and determine the activation of any future requirements for an update or change in the management practices and protocols adopted at the maturation pad under the proposed FOGO transition. The site-specific odour and dust validation assessment should include the following components:

<ul style="list-style-type: none"> <li>- Validation Phase 1 (Pre-FOGO): Conduct a baseline odour assessment pre-FOGO transition to characterise current operation condition.</li> <li>- Validation Phase 2 (Post-FOGO with OCS): Conduct an odour emissions control assessment with the Tea Gardens Facility operating with FOGO and the purpose-built OCS. Validation Phase 2 will also conduct a comparison of the outcomes from the previous validation phase as a basis to determine if further mitigation measures and controls are required.</li> <li>- All sampling and testing protocols adopted as part of Validation Phase 1 to Validation Phase 2 should consider all relevant standards and guidelines</li> </ul> <p>Overall, a negligible or net improvement in odour and dust emissions is expected at the Tea Gardens Facility compared to the current operations. The transition to FOGO will not result in a change to the current licenced processing capacity at the Tea Gardens Facility and is not expected to result in an elevated odour and dust impact risk based on the assessed reduction measures adopted for the initial FOGO composting phase. The adoption of a fully enclosed and engineered environmental operating condition augmented with a purpose-built biofilter system for air emission treatment is reflective of best practice for the initial phase of FOGO composting in Australia. This is on the basis that the FOGO is processed within the existing approved wood waste building for a minimum period of 14 days and up to 28 days, based on processing conditions.</p>	
<b>Noise and Vibration</b>	
<p>The following recommendations are provided as a result of the assessment of noise emissions from the ANL Tea Gardens facility undertaken by Koikas Acoustic Pty Ltd under the current proposal:</p> <ul style="list-style-type: none"> <li>• The high-speed grinder and low-speed shredder are to be located within the new wood waste processing building.</li> <li>• The high-speed grinder shall not be used at any time before 7 am.</li> <li>• When the high-speed grinder is in use, the roller doors to the wood waste processing building must be closed to contain noise within the building.</li> <li>• Between 6 am and 7 am, externally located screeners and/or shredders shall not be operated.</li> <li>• Between 6 am and 7 am, roller doors in the wood waste processing shed are to be closed.</li> <li>• Roller doors to all other sheds and buildings may remain open if needed.</li> </ul> <p>The proposal will not introduce additional on-site noise sources nor result in any additional vehicle traffic on-site or on-road. It simply relates to adding FOGO feedstock to the existing wood waste material the site currently handles. The overall site tonnage of 150,000tpa will not change, only the allocation will change to 50,000tpa FOGO and 100,000tpa wood waste.</p> <p>Acoustic controls previously advised for the site under DA-9/2021 and that form part of that approval is retained for this assessment. No additional controls are required to retain acoustic compliance under the current proposal.</p>	<b>Section 8.2.5</b>
<b>Biodiversity</b>	
<p>The following mitigation measures will be implemented during operation including:</p> <ul style="list-style-type: none"> <li>• Protection of retained habitat/vegetation.</li> <li>• Retention of Habitat Values.</li> <li>• Erosion Control.</li> </ul> <p>Weed management measures will be undertaken at the ANL Facility including:</p>	<b>Section 8.7.6</b>

<ul style="list-style-type: none"> <li>• All machinery introduced to the site will be cleaned of all soil and organic matter prior to entering the Site.</li> <li>• Road registered haulage vehicles are required to remain on the formed access roads and include induction for drivers on the need for trucks to be cleaned of loose mud, dirt and organic matter prior to entering the site. Where visible mud or organic matter is present on road registered truck, the Site Manager is to remind the driver of the need for cleaning prior to entry.</li> <li>• Personnel or contractors entering the site will be reminded during inductions of the need to enter the site with clothing, boots, and PPE free of potential pathogens from other properties.</li> <li>• Regular monitoring and inspections to determine the current presence of weed species and their abundance. The frequency of monitoring will be dependent upon the success of the control measures and the level of infestations.</li> <li>• Control of weeds will be predominantly through manual removal to limit the use of chemicals. Chemical controls will only be utilised where there are significant outbreaks.</li> </ul>	
<b>Surface and Groundwater</b>	
<ul style="list-style-type: none"> <li>• This application only seeks to include 50,000tpa of FOGO as an alternative feedstock. It requires no changes to the existing approved shed, as the building has been previously designed and approved to undertake composting of wood and vegetative waste. Therefore, the erosion and sediment control evaluation conducted as part of DA9/2021, which approved the construction of the shed, remains applicable.</li> <li>• As the construction footprint will be in excess of 2,500m<sup>2</sup>, typically it would be expected that a detailed Soil and Water Management Plan would need to be prepared for the construction stage prior to release of the Construction Certificate. This would normally include calculations of likely soil loss during construction, instructions on preferred construction sequence and limiting land disturbance, and calculations for the provision and sizing of any temporary sedimentation basin to cover the period of civil works.</li> <li>• The current proposal is within the existing development footprint and will likely limit any significant risk of erosion and sedimentation issues. The site falls below the 'A-Line' in Figure 4.6 of The Blue Book and as such is classified as having a Low Erosion Hazard potential.</li> <li>• A RUSLE calculation has also been carried out as per the "Blue Book" (refer to Section 12.0 of the assessment for the calculation). The resulting computed soil loss was calculated as 224m<sup>3</sup>/ha/yr, or 134m<sup>3</sup>/yr over the combined site disturbance area (0.6ha). This result is below the 150m<sup>3</sup>/yr trigger in The Blue Book. As such, no construction sedimentation basins are specifically required during construction, and the erosion risk should be able to be adequately addressed with standard construction erosion control measures such as silt fencing and sandbagging. It is noted, however, that the existing silt traps and storage dams will operate as de facto sedimentation basins anyway, providing additional surety that construction sedimentation issues can be appropriately addressed.</li> <li>• The site operates under an active management scenario whereby no runoff is permitted to leave the development footprint under normal operating conditions. Surface runoff is captured and stored for re-use onsite. The slight increases in internal water demand will result in a minor improvement to overall long-term site discharge conditions. In addition, the current proposal is not impacted by local or regional flooding and will not have any impact on local or regional flooding.</li> </ul>	<b>Section 8.4.5</b>

<p><u>Monitoring Program:</u></p> <ul style="list-style-type: none"> <li>Any maintenance will be carried out by the proprietors of the processing plant. This will normally be limited to periodic cleaning of the water tanks and removal of excess sediment from the silt traps and dams (both periodically and after major storm events).</li> <li>Constant monitoring of dam levels is undertaken to ensure that stored water is either utilised on site or dispersed around the site as required. This is particularly important in the leadup to forecasting large rainfall events, to ensure that the minimum storage volume is available in a 1-in-10-year event.</li> <li>Under current EPA Environmental Protection Licence requirements, the site operators <ul style="list-style-type: none"> <li>keep daily observations and records, including.</li> <li>Rainfall.</li> <li>Wind speed &amp; direction.</li> <li>Dam storage levels.</li> <li>Onsite water usage.</li> </ul> </li> <li>Sediment dams will be managed using the following: <ul style="list-style-type: none"> <li>All sediment basins will be maintained by de-silting when the capacity is diminished,</li> <li>Sediment dams and clean water dams will be visually assessed for water quality and volumes on a regular basis or as required after high rainfall events,</li> <li>If discharge is required, the visual assessment will be followed by sampling and testing of the water quality prior to discharge to ensure water quality criteria are met,</li> </ul> </li> <li>Monitoring and testing records are kept onsite and also provided to the EPA as required by the current EPL.</li> <li>The following management checks on the surface water flows will be undertaken at least quarterly and recorded: <ul style="list-style-type: none"> <li>Visual check of stability and operation of all banks, ponds, channels, and spillways, effecting any necessary repairs,</li> <li>Visually check the discharge point to ensure that the discharge does not cause erosion or scouring of the creeks. Effecting any necessary repairs,</li> <li>Drains and culverts for both clean water and dirty water will be examined for vegetation cover and blockages and maintenance will be performed to ensure they are working as designed.</li> </ul> </li> </ul>	
<p><b>Aboriginal Heritage</b></p>	
<ul style="list-style-type: none"> <li>All land and ground disturbance activities must be confined to the study area assessed by OzArk Environment &amp; Heritage, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed area, then further archaeological assessment may be required.</li> <li>Aboriginal heritage assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the <i>Unanticipated Finds Protocol</i> in accordance with <i>OEH guidelines</i> should be followed.</li> <li>All relevant staff should be made aware of their statutory obligations for heritage under the National Parks and Wildlife Act 1974 and the contents of the <i>Unanticipated Finds Protocol</i></li> <li>All the information presented by OzArk Environment &amp; Heritage meets the requirements of the <i>Due Diligence Code of Practice for the Protection of</i></li> </ul>	<p><b>Section 8.5.5.1</b></p>



<p><i>Aboriginal Objects in New South Wales.</i> It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.</p> <ul style="list-style-type: none"> <li>In the unlikely event that human remains are discovered during the proposed works, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal. If the remains are deemed to be Aboriginal in origin the Registered Aboriginal Parties should be advised of the find as directed by the appropriate heritage team within Heritage NSW. Heritage NSW would advise the Proponent on the appropriate actions required.</li> </ul>	
<b>Historic Heritage</b>	
<ul style="list-style-type: none"> <li>The study area for the project is assessed based on the information provided, the archaeological field observations, and the assessment of archaeological potential and significance. As the study area has been assessed as not having a likelihood of containing any historical heritage items, the proposed development would not harm heritage objects.</li> </ul>	<b>Section 8.6.2.4</b>
<b>Visual Amenity</b>	
<ul style="list-style-type: none"> <li>As the Project site is already adequately screened from view, no additional mitigation measures are proposed. The design and location characteristics of the Project provide sufficient mitigation. Retention of existing trees within the site is recommended to maintain the existing level of screening.</li> </ul>	<b>Section 8.9.5</b>
<b>Bushfire</b>	
<ul style="list-style-type: none"> <li>The proposal in its current form will not require the removal of any vegetation, nor will include any increase in the development footprint or reduction of existing asset protection zones.</li> <li>The proposal will not result in any increase in risk to occupants of the site or emergency service personnel relating to bush fire hazards.</li> <li>Given the fact that the proposal does not include any form of habitable structure, the assessment of this proposal simply needs to ensure compliance with the aim and objectives of <i>PBP 2019</i> and there is no requirement for any construction to a BAL standard.</li> </ul> <p>The following comments have been generated to enable the proposal to comply with <i>PBP (2019)</i>:</p> <ul style="list-style-type: none"> <li>Afford buildings and their occupant's protection from exposure to a bush fire <ul style="list-style-type: none"> <li>Comment – There is an adequate asset protection zone in place and the construction of the building is non-flammable as such it is deemed that the building and its occupants are provided adequate protection from exposure to bush fire. It is also noted that the development will in no way result in any reduction in this existing protection. It is considered that the proposal is consistent with this objective</li> </ul> </li> <li>Provide for a defendable space to be located around buildings. <ul style="list-style-type: none"> <li>Comment – The existing asset protection zone is considered to be an acceptable defendable space. In addition, it is noted that this asset protection zone has not been reduced as a result of this proposal as compared to that previously approved. This objective is considered to be met</li> </ul> </li> <li>Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevents the likely fire spread to the building <ul style="list-style-type: none"> <li>Comment – The existing asset protection zone is considered to be an appropriate separation and the well-managed nature of the development is considered to be one of the appropriate other measures which shall help prevent the likely spread of fire. The development as proposed will in no way</li> </ul> </li> </ul>	<b>Section 8.8.5</b>

<p>later the existing and approved situation in this regard and this objective is considered to be met</p> <ul style="list-style-type: none"> <li>• Ensure that appropriate operational access and egress for emergency service personnel and occupants is available <ul style="list-style-type: none"> <li>- Comment – The existing access is significantly wider than the minimum requirements and therefore, whilst it is significantly longer, it is existing and is to be considered acceptable. The proposal will in no way alter the operational access and egress for the site. The proposal is considered to meet this objective</li> </ul> </li> <li>• Provide for ongoing management and maintenance of BPMs <ul style="list-style-type: none"> <li>- Comment – There is excellent and ongoing management of the site, and this objective has been met</li> </ul> </li> <li>• Ensure that utility services are adequate to meet the needs of fire fighters <ul style="list-style-type: none"> <li>- Comment – There is a significant water supply which is located such that this objective is met. The requirements under PBP for developments of this nature also include:</li> </ul> </li> <li>• To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation. <ul style="list-style-type: none"> <li>- Comment – The managed nature of the site, including the especially well-managed nature of the access is considered to provide safe access and egress in the event of a bush fire. Then the proposal is a complaint in this regard.</li> </ul> </li> <li>• To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development. <ul style="list-style-type: none"> <li>- Comment – The site has an emergency management plan in place for events such as bush fire and this ensures compliance in this regard.</li> </ul> </li> <li>• To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. <ul style="list-style-type: none"> <li>- Comment – The water supply is acceptable for bush firefighting purposes; the electrical supply is located so that it is not a hazard; there is no gas supply. The proposal is compliant in this regard.</li> </ul> </li> <li>• To provide for the storage of hazardous materials away from the hazard wherever possible. <ul style="list-style-type: none"> <li>- Comment – The nature of the business is that there are flammable materials stored within the site (e.g. timber waste products). The location of such storage areas has been sited to ensure there is sufficient distance from hazards and also so that in the event of a bush fire, it will not result in any potential obstruction for access to or egress from the site. Where materials are stored in sheds near the edge of the development, the sides of the sheds facing the hazard are closed and all apertures greater than 2mm are to be adequately screened. The proposal is compliant in this regard.</li> <li>- In addition to meeting the above requirements, it is noted that all parts of the development, and especially of the proposal, are located outside of BAL-FZ and therefore outside of Flame Zone and this will assist in the prevention of fire spread from any potential bush fire to within the site.</li> </ul> </li> </ul>	
<b>Socio-Economic</b>	
<ul style="list-style-type: none"> <li>• Proactively consult throughout the life of the development with those residents who could potentially be adversely impacted by the operations,</li> <li>• Maintain a community complaints register and ensure that the existence of the number is advertised at the site entrance,</li> <li>• Liaise with the Council in relation to any complaints received,</li> </ul>	<b>Section 8.11.5</b>

<ul style="list-style-type: none"> <li>• Give preference when engaging new employees, where practicable, to candidates from surrounding areas over candidates with equivalent experience and qualifications from further afield, and</li> <li>• Give preference, where practicable and cost-effective, to suppliers of equipment, services, or consumables located within surrounding communities.</li> </ul>	
<b>Waste Management</b>	
<ul style="list-style-type: none"> <li>• Waste management and minimisation will form part of the site induction program. All Project and site personnel will be trained in the requirements of waste minimisation, recognising which types of materials are recyclable and their obligations to use recycling facilities provided on site.</li> <li>• Specific locations for waste management (e.g. processing locations, waste bin locations, material stockpile locations) will be established on site and signposted appropriately.</li> <li>• Waste disposal bins will have clear signage and instructions for use to avoid cross-contamination.</li> <li>• Waste will be disposed of at an appropriate licensed facility.</li> <li>• All waste being transported off-site will be covered and disposed of or recycled at an appropriately licensed facility.</li> <li>• Storage of all hazardous substances and dangerous goods will be in accordance with SDS requirements in a bunded area.</li> <li>• Any hazardous waste will be managed and handled by an appropriately licensed contractor and transported for disposal to a licensed facility.</li> <li>• Any material contaminated by spills i.e. fuel, oil, lubricants, etc., including empty fuel, oil, and chemical containers, will be stored in a sealed secure container within a bunded area and will be transported to a waste disposal site approved by the NSW EPA to accept such material.</li> <li>• Product storage areas will be located away from waterways and the stormwater system.</li> <li>• Waste bins will be regularly collected and disposed of at a licensed waste facility.</li> <li>• All incoming feedstocks will be unloaded in an enclosed building and prepared for composting as soon as possible.</li> <li>• Feedstock delivery and product outgoing schedules will be coordinated to avoid a queue of incoming or outgoing trucks for extended periods of time.</li> <li>• Leachate will be collected and re-used in site processing operations.</li> <li>• Fuel will be stored in a self-bunding tank. A spill kit will be kept next to the fuel storage area.</li> <li>• Regular monitoring will be undertaken to track waste management on site. This will be through a series of formal and informal inspections at regular intervals.</li> <li>• Audits will be undertaken to assess the effectiveness of controls and compliance with the site operations plan, approval, and relevant guidelines.</li> <li>• Wood waste and FOGO derived products will be sampled and tested to ensure compliance with customers' specifications and applicable guidelines and standards.</li> <li>• Commercial agreements will be in place with providers to ensure all incoming feedstock products are in accordance with agreed specifications.</li> </ul>	<b>Section 8.10.5.6</b>
<b>Hazards and Risks</b>	
<p>While the PRS for the proposed facility has determined that the development is not considered a hazardous or offensive development, the following controls will still be implemented:</p>	<b>Section 8.12.5</b>

<ul style="list-style-type: none"> <li>• All mobile plant and equipment will be fitted with fire extinguishers,</li> <li>• An Emergency Response Plan will be prepared and implemented for the facility,</li> <li>• All staff on site will be appropriately trained in the handling of dangerous goods, and</li> <li>• Flammable and combustible liquids will be stored in accordance with AS1940.</li> </ul>	
<b>Fire and Incident Management</b>	
<p>The following mitigation and management measures will be implemented to address fire safety:</p> <ul style="list-style-type: none"> <li>• A fire hydrant system to comply with AS2419.1-2005 and FRNSW waste facilities guideline.</li> <li>• Automatic fire suppression system in accordance with AS2118.1-2017 &amp; FRNSW waste facilities guideline.</li> <li>• Fire hose reel system in accordance with AS2441-2005.</li> <li>• Portable fire extinguishers throughout the building in accordance with AS2444-2001.</li> <li>• Exit and emergency lighting in accordance with AS2293.1-2018.</li> <li>• Fire detection and alarm system.</li> <li>• Smoke hazard management system.</li> <li>• Two-way radio systems for all staff within the facility to aid in emergency notification and evacuation.</li> <li>• Adoption of Emergency Control Procedures including the development of an Emergency Response Plan and Emergency Management Plan, along with risk minimisation strategies.</li> <li>• Staff training in emergency response, including: <ul style="list-style-type: none"> <li>○ Use of firefighting equipment</li> <li>○ Fire awareness</li> <li>○ Emergency evacuation procedures</li> <li>○ Location of fire systems and firefighting equipment.</li> </ul> </li> </ul>	<p><b>Section 8.12.5</b></p>

## 9. JUSTIFICATION AND CONCLUSIONS

### 9.1 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecologically Sustainable Development (ESD) is a primary objective of environmental protection in NSW. The objectives of the EP&A Act include the encouragement of the principles of ESD. Supplementary to the EP&A Act objectives, Part 9, Division 5, Clause 193 of the Environmental Planning and Assessment Regulation 2021 (EP & A Reg 2021) requires a proponent to include in an EIS the reasons justifying the development, including the principles of ESD. Clause 193 of the EP & A Reg 2021 defines the principles of ESD as follows:

- (a) *The **precautionary principle**, namely, that if 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. In the application of the precautionary principle, public and private decisions should be guided by:*
  - (i) *Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
  - (ii) *An assessment of the risk-weighted consequences of various options.*
- (b) ***Inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*
- (c) ***Conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.*
- (d) ***Improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services, such as:*
  - (i) *Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
  - (ii) *The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
  - (iii) *Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

#### 9.1.1 The Precautionary Principle

The Precautionary Principle states that if there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The Development has been assessed for impacts relating to air quality and odour, noise, traffic and transport, visual amenity, water resources, flora and fauna, Aboriginal heritage, and non-indigenous heritage. This EIS, combined with the consultation undertaken with relevant government agencies, and local stakeholders, has provided an understanding of the potential implications of the development and subsequently confirmed the mitigation measures required.





Through the adoption of an anticipatory approach, each potential issue arising from the Project has been identified, evaluated, and mitigated through a series of design or management solutions.

### 9.1.2 Inter-generational Equity

Intergenerational Equity is centred on the concept that the present generation should ensure the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations. There is a moral obligation to ensure that today's economic progress, which would benefit current and future generations, is not offset by environmental deterioration.

Throughout the assessment, the type and extent of potential impacts caused by the Project have been analysed and mitigated. The assessment methodologies have adopted a risk-based and worst-case scenario approach to ensure improved environmental, social, and economic protection for current and future generations. The environmental management and mitigation measures have been developed to minimise the impact of the Project on the environment for future generations.

The management and mitigation measures proposed in **Section 8** above would assist in ensuring that the development does not pose any significant impact or risk to the surrounding environment and safeguards the environment for future generations.

### 9.1.3 Conservation of Biological Diversity and Ecological Integrity

The principle of Conservation of Biological Diversity and Ecological Integrity holds that the conservation of biological diversity and ecological integrity should be a fundamental consideration for development proposals.

The site is located within the NSW North Coast Bioregion and Karuah Manning Sub-bioregion. The site is also located within the Newcastle Coastal Ramp NSW Landscape and occurs in the Mid Coast Local Government Area (LGA). With the exception of the existing footprint of the ANL operations, the surrounding area is undeveloped and dominated by native vegetation consisting primarily of open forest. The invasive *Pinus elliotii* (Slash Pine) is common within parts of the study area.

An ecological assessment conducted by a qualified specialist has identified the extent of biological diversity on-site and in the surrounding area. The assessment concludes that the proposal is unlikely to disrupt the life cycle of any threatened species. There is not expected to be any significant impact on threatened species, Endangered Ecological Communities, critical habitats, or endangered populations due to the proposed works. This includes species listed under the *EPBC Act 1999* and the *BC Act 2016*.

### 9.1.4 Improved Valuation, Pricing, and Incentive Mechanisms

The principle of Improved Valuation, Pricing and Incentive Mechanisms deems that environmental factors should be included in the valuation of assets and services. The cost associated with using or impacting upon an environmental resource is seen as a cost incurred to protect that resource.

Given that there are no changes to the footprint of the approved wood waste processing shed or a reduction in the setback to existing or proposed vegetation as a result of this proposal, no additional disturbance to the previously approved disturbance footprint is required. Consequently, this proposal would not have any impacts on waterways, and environmental resources should not be significantly impacted.

The Proposal optimises the valuation and pricing of natural resources by encouraging diversion away from landfilling and encouraging recycling. Further justification in this regard is provided in Section 3.3 and below.

## 9.2 PROJECT NEED

Due to NSW Government waste targets and initiatives, including the *Waste and Sustainable Materials Strategy 2041* (WaSM), there is a mandate to have all household food and garden organics diverted from landfill in all LGAs by 2030. These initiatives are designed to reduce organic waste in landfills, where it generates methane,

a potent greenhouse gas, and instead creates a clean stream of a valuable resource that can be beneficially reused. This has created the need for significant additional waste recycling infrastructure and processing capacity in NSW to meet these initiative targets.

The proposed receipt, composting, and reuse of FOGO by ANL will significantly contribute to these initiatives being met.

The capacity of 50,000 tpa of FOGO will allow the facility to continue to produce high quality composts suitable for land application in gardens, landscaping, farming, and site rehabilitation, and further enhance the availability of waste infrastructure in the local region.

### 9.3 OBJECTS OF THE EP&A ACT 1979

Development Consent is being sought under Part 4 of the EP&A Act and must therefore satisfy the objects of the EP&A Act. **Table 57** identifies the objects of the EP&A Act and confirms that each has been satisfied by the Proposal and this EIS.

**Table 57: Objects of the EP&A Act 1979**

Object	Coverage
a) to promote the social and economic welfare of the community and a better environment by the proper management, development, and conservation of the State's natural and other resources.	The development will provide for beneficial re-use of organics without compromising the surrounding land uses, natural resources, community, or environment.  The development will utilise an existing operating site to receive and produce organic products that would otherwise be sent to landfill.
b) to facilitate ecologically sustainable development by integrating relevant economic, environmental, and social considerations in decision-making about environmental planning and assessment.	On the basis that the development will have minimal additional residual impacts on the biophysical environment and as discussed in <b>Section 8</b> , the Proposal is considered to conform to the principles of ecologically sustainable development.
c) to promote the orderly and economic use and development of land.	The development will result in the beneficial use of land for ongoing resource recovery activities without limiting surrounding land uses. The development provides jobs for members of the local community and also produces landscape products for commercial sale.
d) to promote the delivery and maintenance of affordable housing.	Not applicable to the application.
e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities, and their habitats.	The development is not proposing the increase the disturbance footprint of the site and all offensive activities will be undertaken within an enclosed building that will have a dedicated odour control system. There will be no increased impact on native animals and plants, ecological communities, and their habitats.
f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	No Aboriginal sites, or sites of historic heritage significance, were identified during surveys for the proposal.
g) to promote good design and amenity of the built environment.	Not applicable to the application.
h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not applicable to the application.

Object	Coverage
i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	The relevant environmental planning legislation has been reviewed in <b>Section 5</b> . It has been concluded that the development will meet the requirements of all relevant legislation and will not constrain the ability of different levels of government to exercise their functions.
j) to provide increased opportunities for community participation in environmental planning and assessment.	The Applicant anticipates that this application will be made publicly available by MCC and that the public will be encouraged to make submissions.



## 9.4 CONCLUSIONS

Wedgetail has prepared this Environmental Impact Statement (EIS) on behalf of ANL Landscapes, to support an application to Mid Coast Council (MCC), for the receipt and composting of 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) within an existing approved wood waste building at 12 Pindimar Road, Tea Gardens, NSW.

In addressing the requirements of the Secretary's Environmental Assessment Requirements (SEARs), this assessment has demonstrated that the proposed development is consistent with the objectives of the EP&A Act and is therefore justified based on the findings identified by the environmental, social, and economic investigations performed through the production of this document.

The subject land is zoned RU2 – Rural Landscape and is bordered by land similarly zoned for rural use to the north, south, east, and west. Land in the area is dominated by scattered areas of remnant vegetation and cleared areas for agricultural grazing. The site boundaries are extensively landscaped which provides ample visual screening from the surrounding rural landscape. The property has access to existing suitable road infrastructure which allows for the efficient transport of both raw materials and finished products. The site positioning minimises the social and environmental impacts, which are further reduced by the proposed management and mitigation measures.

This assessment has demonstrated the development will not result in any significant impacts from operations. Any potential impacts identified as part of the EIS have been demonstrated to be able to be managed, mitigated, or reduced which will ensure the quarry can operate without significant impacts to the receiving environment and meet the objectives of Ecologically Sustainable Development.

In order to reach State waste diversion targets, the NSW government has identified that additional waste infrastructure is required to receive, process, and convert organics for beneficial use. The establishment of this FOGO operation will assist in the provision of this critical waste infrastructure and produce recycled organic materials that would otherwise go to landfills.

As detailed throughout this EIS, it has been demonstrated that the Proposal can be operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives, and reasonable community expectations.

On this basis, this development should be recommended for **APPROVAL**.

## 10. REFERENCES

- *Protection of Environment Operations Act 1997 (POEO Act)*
- *NSW EPA Waste Classification Guidelines*
- *Environmental Planning and Assessment Act 1979*
- *Waste Avoidance and Resource Recovery Act 2001*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Occupational Health and Safety Act 2000 and the Occupational Health and Safety Regulations 2001*
- *Environmental Protection (Controlled Waste) Regulation 2001*
- *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Part 5A, Division 4, Clause 5A.26 Garbage and waste storage*
- *Australian Standards 2601-2001 Demolition of Structures*
- *Mulch Resource Recovery Order 2016 and Mulch Resource Recovery Exemption 2016*
- *NSW EPA's Draft Protocol for managing asbestos during resource recovery of construction and demolition waste*
- *NSW EPA's Environmental guidelines: Composting and related organics processing facilities*
- *NSW Plastics Action Plan*
- *NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs*
- *NSW Waste Avoidance and Sustainable Materials Strategy 2041*
- *Environmental Guidelines; Composting and Related Organics Processing Facilities, July 2004, Department of Environment and Conservation (NSW)*
- Tattersall Lander Pty Ltd (2024). Bush Fire Risk Assessment - 12 Pindimar Road, Tea Gardens.
- Tattersall Lander Pty Ltd (2024). Water Sensitive Design Strategy - 12 Pindimar Road, Tea Gardens.
- Koikas Acoustics Pty Ltd (2024). Acoustical Report – Proposal to Receive and Process Food Organics and Green Organics (FOGO) at 12 Pindimar Road, Tea Gardens.
- Varga Traffic Planning Pty Ltd (2024). Traffic and Parking Assessment - 12 Pindimar Road, Tea Gardens.
- The Odour Unit Pty Ltd (2024). Air Quality and Odour Impact Assessment - 12 Pindimar Road, Tea Gardens.
- Marline Building Services Engineers (2024). Fire and Incident Management – Fire Services Design - 12 Pindimar Road, Tea Gardens.
- OZARK Environment & Heritage (2024). Aboriginal Due Diligence & Historic Heritage Assessment – Enclosed Food and Gardens Organics Composting Facility – Tea Gardens.
- Wildthing Environmental Consultants (2020). Ecological Assessment - Proposed Extension to the Existing Australian Native Landscapes Facility - Lot 1 DP714149 Pindimar Road Tea Gardens.
- Denis Smith, Planning and Property Consultant Tomasy Pty Ltd (2014). Statement of Environmental Effects DA 227/2015 - Lot 1 DP 714149 12 Pindimar Road, Tea Gardens





- Denis Smith, Planning and Property Consultant Tomasy Pty Ltd (2020). Statement of Environmental Effects DA 9/2021- Lot 1 DP 714149 12 Pindimar Road, Tea Gardens
- Tomasy Planning Pty Ltd (2023). Statement of Environmental Effects - Modification to DA-9/2021- Wood Waste Processing Building



## **APPENDIX A – SECRETARY’S ENVIROMENTAL ASSESSMENT REQUIREMENTS**

11 January 2024

Mr Shaun Smith  
Wedgetail Project Consulting Pty Ltd  
PO Box 234  
Cardiff NSW 2285

EF23/17221  
SEAR 1841

Dear Mr Smith

**Composting facilities or works**  
**12 Pindimar Road, Tea Gardens (Lot 1/DP714149) - Mid Coast Council LGA**  
**Planning Secretary's Environmental Assessment Requirements (SEAR) 1841**

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*. In preparing the SEARs, the Department of Planning and Environment (the Department) has consulted with the Environment Protection Authority. A copy of their requirements is attached.

If 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 Climate Change, Energy, the Environment and Water on (02) 6274 1111.

Should you have any further enquiries, please contact Elke Tuckfield, Planning and Assessment, at the Department on (02) 8275 1641 or via [elke.tuckfield@dpie.nsw.gov.au](mailto:elke.tuckfield@dpie.nsw.gov.au).

Yours sincerely



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 2021*.

## Designated Development

<b>SEAR Number</b>	1841
<b>Proposal</b>	To repurpose the existing landscape supply and wood chipping facility to receive and compost 50,000tpa of mixed Food and Garden Organics as alternate feed stock
<b>Location</b>	12 Pindimar Road, Tea Gardens (Lot 1/DP 714149) - Mid Coast Council LGA
<b>Applicant</b>	Australian Native Landscapes Pty Ltd
<b>Date of Issue</b>	11 January 2024
<b>General Requirements</b>	The Environmental Impact Statement (EIS) must comply with the assessment requirements and meet the minimum form and content requirements in sections 190 and 192 of the <i>Environmental Planning and Assessment Regulation 2021</i> .
<b>Key Issues</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• <b>strategic and statutory context</b> – including:           <ul style="list-style-type: none"> <li>– a detailed justification for the proposal and suitability of the site for the development</li> <li>– a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies</li> <li>– a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out.</li> <li>– a description of how the proposed expansion integrates with existing on-site operations</li> <li>– a description of any amendments to and/ or additional licence(s) or approval(s) required to carry out the proposed development.</li> </ul> </li> <li>• <b>suitability of the site</b> – including:           <ul style="list-style-type: none"> <li>– a detailed justification that the site can accommodate the proposed processing capacity, having regard to the scope of the operations and its environmental impacts and relevant mitigation measures</li> <li>– floor plans depicting the proposed internal layout, including the location of machinery and equipment.</li> </ul> </li> <li>• <b>waste management</b> – including:           <ul style="list-style-type: none"> <li>– details of the type, quantity and classification of waste to be received at the site</li> <li>– details of the resource outputs and any additional processes for</li> </ul> </li> </ul>

	<p>residual waste</p> <ul style="list-style-type: none"> <li>- details of waste handling including, transport, identification, receipt, stockpiling and quality control</li> <li>- the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the <i>NSW Waste Avoidance and Sustainable Materials Strategy 2041</i>.</li> </ul> <ul style="list-style-type: none"> <li>• <b>hazards and risk</b> – including: <ul style="list-style-type: none"> <li>- a preliminary risk screening completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 3 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).</li> </ul> </li> <li>• <b>fire and incident management</b> – including: <ul style="list-style-type: none"> <li>- an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines</li> <li>- technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment, fire management (including the location of fire hydrants and water flow rates at the hydrants) and containment measures</li> <li>- details of the size and volume of stockpiles and their arrangements to minimise fire spread and facilitate emergency vehicle access</li> <li>- the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Fire and Rescue guideline <i>Fire Safety in Waste Facilities</i> dated 27 February 2020</li> </ul> </li> <li>• <b>air quality</b> – including: <ul style="list-style-type: none"> <li>- a description of all potential sources of air and odour emissions during construction and operation</li> <li>- an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines</li> <li>- a description and appraisal of air quality impact mitigation and monitoring measures.</li> </ul> </li> <li>• <b>noise and vibration</b> – including: <ul style="list-style-type: none"> <li>- a description of all potential noise and vibration sources during construction and operation, including road traffic noise</li> <li>- a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines</li> <li>- a description and appraisal of noise and vibration mitigation and monitoring measures.</li> </ul> </li> <li>• <b>soil and water</b> – including: <ul style="list-style-type: none"> <li>- a description of local soils, topography, drainage and landscapes</li> <li>- details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the <i>Water Act 1912</i> and/or the <i>Water Management Act 2000</i></li> <li>- an assessment of potential impacts on floodplain and stormwater</li> </ul> </li> </ul>
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	<p>management and any impact to flooding in the catchment</p> <ul style="list-style-type: none"> <li>- details of sediment and erosion controls</li> <li>- a detailed site water balance</li> <li>- an assessment of potential impacts on the quality and quantity of surface and groundwater resources</li> <li>- details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts</li> <li>- a description and appraisal of impact mitigation and monitoring measures.</li> </ul> <ul style="list-style-type: none"> <li>• <b>traffic and transport</b> – including: <ul style="list-style-type: none"> <li>- details of road transport routes and access to the site</li> <li>- road traffic predictions for the development during construction and operation</li> <li>- swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site</li> <li>- an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.</li> </ul> </li> <li>• <b>biodiversity</b> – including: <ul style="list-style-type: none"> <li>- accurate predictions of any vegetation clearing on site or for any road upgrades</li> <li>- a detailed assessment of the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, groundwater dependent ecosystems and any potential for offset requirements in accordance with the current Environment and Heritage Group legislation and guidelines</li> <li>- details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies</li> <li>- a detailed description of the measures to avoid, minimise, mitigate and/or offset biodiversity impacts.</li> </ul> </li> <li>• <b>community and stakeholder engagement</b> – including: <ul style="list-style-type: none"> <li>- a detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach</li> <li>- a report on the results of the implementation of the strategy including issues raised by the community and surrounding occupiers and landowners that may be impacted by the proposal</li> <li>- details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal</li> <li>- details of the proposed approach to future community and stakeholder engagement based on the results of the consultation.</li> </ul> </li> <li>• <b>visual</b> – including an impact assessment at private receptors and public vantage points.</li> <li>• <b>heritage</b> – including Aboriginal and non-Aboriginal cultural heritage.</li> </ul>
<b>Environmental</b>	The EIS must assess the proposal against the relevant environmental planning

<b>Planning Instruments and other policies</b>	<p>instruments, including but not limited to:</p> <ul style="list-style-type: none"> <li>• State Environmental Planning Policy (Transport and Infrastructure) 2021</li> <li>• State Environmental Planning Policy (Resilience and Hazards) 2021 (Chapters 2, 3 and 4)</li> <li>• State Environmental Planning Policy (Biodiversity and Conservation) 2021</li> <li>• Great Lakes Local Environmental Plan 2014</li> <li>• relevant development control plans and section 7.11 plans.</li> </ul>
<b>Guidelines</b>	<p>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 <a href="https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Industries">https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Industries</a>. 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.</p>
<b>Consultation</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• Environment Protection Authority</li> <li>• Transport for NSW</li> <li>• Fire &amp; Rescue NSW</li> <li>• WaterNSW</li> <li>• Mid Coast Council</li> <li>• the surrounding landowners and occupiers that are likely to be impacted by the proposal.</li> </ul> <p>Details of the consultation carried out and issues raised must be included in the EIS.</p>
<b>Further consultation after 2 years</b>	<p>If you do not lodge an application under Section 4.12(8) of the <i>Environmental Planning and Assessment Act 1979</i> 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.</p>

Department of Planning and Environment  
via email

Attention: Elke Tuckfield, [elke.tuckfield@dpie.nsw.gov.au](mailto:elke.tuckfield@dpie.nsw.gov.au)

Notice Number      1635385  
Date                    14-Dec-2023

**RE: Composting facilities or works - 12 Pindimar Road, Tea Gardens (Lot 1/DP714149) - SEAR 1841**

I refer to your request for the Environment Protection Authority's (EPA) requirements for the Secretary's Environmental Assessment Requirements (SEARs) for the proposed composting facility at 12 Pinimar Road, Tea Gardens received by EPA on 7 December 2023.

It is understood that the application relates to receipt and composting of up to 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) within an approved but not constructed wood waste building. It is further understood that the material will then be removed from the building for further composting and maturation in the open at the premises. From the information supplied, the material will be held and processed within the shed for a period of between 2 to 4 weeks and then further held and processed for a period of 6 to 8 weeks in the open at the premises.

The EPA has considered the details of the proposal as provided and has identified the information it requires to issue its general terms of approval in Attachment A and Attachment B. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1. Details of the potential cumulative air quality and odour impacts, including cumulative impacts and mitigation measures to minimise these impacts.
2. Details on water and waste management including controls to manage any runoff from the premises.
3. Details on the types and maximum volumes of feedstock and waste streams to be stockpiled on site.
4. Detail the proposed leachate and storm water collection, storage and disposal systems including demonstration that surface and ground waters will be protected through adequate design, construction and management

In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in Attachment C and any relevant industry codes of practice and best practice management guidelines.

Please note that this response does not cover biodiversity or Aboriginal cultural heritage issues, which are the responsibility of the Environment and Heritage Group of DPE.

The Proponent should be made aware that any commitments made in the EIS may be formalised as approval conditions and may also be placed as formal licence conditions.

The Proponent should be made aware that, consistent with provisions under Part 9.4 of the *Protection of the Environment Operations Act 1997* ("the Act") the EPA may require the provision of a financial assurance and/or assurances. The amount and form of the assurance(s) would be determined by the EPA and required as a condition of an Environment Protection Licence ("EPL"). A separate application to the EPA to vary the licence will be required if planning consent is granted and before operation commences.

Yours sincerely



**Simon Taylor**

**Unit Head**

**Environment Protection Authority**

(by Delegation)

## **ATTACHMENT A**

### **Specific EIS Requirements for FOGO processing facility, ANL, Tea Gardens**

The Environmental Impact Statement (EIS) must address the requirements of Section 45 of the *Protection of the Environment Operations Act 1997* (POEO Act) by determining the extent of each impact and providing sufficient information to enable the EPA to determine appropriate conditions, limits and monitoring requirements for an Environment Protection Licence (EPL).

1. The following potential environmental impacts of the project need to be assessed, quantified and reported on.
  - Air
  - Noise
  - Water
  - Land
  - Waste and chemicals.

The EIS should address how the required environmental goals will be met for each potential impact.

2. Describe the management strategies for the treatment and processing of all wastes proposed to be received at the facility.
3. Describe the mitigation and management options that will be used to prevent, control, abate or mitigate identified potential environmental impacts associated with the project and premises to reduce risks to human health and prevent the degradation of the environment.

This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The EIS must also take into consideration cumulative impacts of the proposed activity with those activities existing on the premises and within the area.

#### **Description of the project**

Construction, operation and management of the proposed facility should be consistent with the EPA's guideline "Composting and Related Organics Processing Facilities" (2004) (the Composting Guidelines); (<https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/waste/040061-composting-guidelines.pdf>)

Details of the proposed composting facilities infrastructure, management and processes must be provided for the project, including;

- A map of the premises including windrowing areas, storage areas, and leachate collection and storage ponds.
- The specific types of feedstock and waste that will be received on site, the maximum volumes (daily and annually), number of stockpiles/windrows and locations they will be stored. All putrescible waste streams need to have the maximum volumes nominated at any one time, for the purpose of estimating odour emission rates for the air quality impact assessment. (The EPA notes the types and figures may change during the life of the project depending on a number of factors however this



information is important for an appropriate assessment. The types of waste permitted to be received will be limited to what is nominated in the EIS. The types can be varied through the EPA licence at a later date and depending on the type of waste being sought to be introduced, some additional assessment might be required at that time.)

- The mixing rates required between feedstock and each waste stream to develop a windrow and the dimensions and number of proposed windrows.
- The approximate moisture content of windrows that needs to be achieved and the expected volumes of water that will be needed for each windrow life and total water used on site annually.
- Details of any inconsistency with the Composting Guidelines together with justification for the deviation from the Guidelines and any additional mitigation or management measures proposed.

### **Air Quality Impacts**

The goals of the proposed development in relation to air quality should be to ensure sensitive receptors are protected from adverse impacts from odour and dust.

Details would need to be provided on the proposed measures to manage cumulative odour and dust from all sources. Measures to prevent or control the emission of odour from the premises must be detailed based on the outcome of an air quality impact assessment undertaken in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (DECC, 2005) as appropriate. All potentially impacted residential or sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The EIS should identify any other existing impacts on air quality on the premises and within the area and if necessary, provide an assessment and commentary on the predicted cumulative impacts that may arise.

Emissions from any plant must meet the design criteria detailed in the Protection of the Environment Operations (Clean Air) Regulation 2010. Details need to be provided on the proposed air pollution control techniques from any air emission points, including proposed measures to manage and monitor efficiency and performance.

### **Noise Impacts**

The goal of the project should include design, construction, operation and maintenance of the facility in accordance with relevant EPA policy, guidelines and criteria, and in order to minimise potential impacts from noise.

The EPA expects that potential noise sources are assessed in accordance with the *Noise Policy for Industry* (EPA 2017), and where required mitigation measures are proposed (eg appropriate equipment chosen to minimise noise levels). All residential or noise sensitive premises likely to be impacted by the development must be identified and included in the assessment.

The proposed development may result in an increase in traffic movements. The number of traffic movements associated with the proposal should be quantified and the potential noise impacts associated with these traffic movements need to be assessed in accordance with the *NSW Road Noise Policy* (DECCW, 2011).

## **Surface and Groundwater Impacts**

The goal of the project should include the following.

- No pollution of waters (including surface and groundwater), except to the extent authorised by EPA (ie in accordance with an Environment Protection Licence);
- Polluted water (including effluent, process waters, wash down waters, polluted stormwater or sewage) must be captured and retained on the site through an appropriate collection and storage system. Where it is safe and practicable to do, the polluted water should be treated and beneficially reused; and
- It is acceptable in terms of the achievement or protection of the River Flow Objectives and Water Quality Objectives.

The EIS should document the measures that will achieve the above goals.

Details of the site drainage and any natural or artificial waters within or adjacent to the development must be identified and, where applicable, include details of measures proposed to mitigate potential impacts of the development on these waters.

The EIS must include a water balance for the development including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options. As the processing of material will continue outside the building structure, this needs to address any impacts from this area together with impacts from infiltration from storage and processing areas and water management systems.

If the proposed development intends to discharge waters to the environment, the EIS must demonstrate how the discharge(s) will be managed in terms of water quantity, quality and frequency of discharge and include an impact assessment of the discharge on the receiving environment. This should include:

- ~~Discharge frequency of all water discharges~~ position of any intakes and discharges, volumes, water quality and frequency of all water discharges.
- Description of the receiving waters including upstream and downstream water quality as well as any other water users.
- Demonstration that all practical options to avoid discharge have been implemented and environmental impact minimised where discharge is necessary.

Please note that the current environmental protection licence does not authorise any discharges of potentially polluted water from the premises.

The EIS should provide details of any water management systems for the site to ensure surface and ground waters are protected from contaminants.

The EIS must refer to Water Quality Objectives for the receiving waters and indicators and associated trigger values or criteria for the identified environmental values of the receiving environment. This information should be sourced from the ANZECC (2018) Guidelines for Fresh and Marine Water Quality, available at: <https://www.waterquality.gov.au/anz-guidelines>

The EIS must describe how stormwater will be managed in all phases of the project, including details of how stormwater and runoff will be managed to minimise pollution. Information should include measures to be implemented to minimise erosion, leachate and sediment mobilisation at the site.

The EIS must describe any water quality monitoring programs to be carried out at the project site. Water quality monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutant in NSW* (2004) which is available at: <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/water/approvedmethods-water.pdf>

### **Potential impacts on land**

The goals of the proposed development should include the following:

- No pollution of land, except to the extent authorised by EPA (i.e., in accordance with an Environment Protection Licence); and
- The potential impact of land erosion from the development is mitigated. The EIS should document the measures that will achieve the above goals.

### **Waste**

The EIS must assess all aspects of waste generation, management and disposal associated with the proposed development. The EIS should include the following:

- Demonstrate waste management is in accordance with the principles of the waste hierarchy and cleaner production;
- Where potential impacts associated with the handling, processing and storage of all waste materials generated at the premises are identified, these be satisfactorily mitigated;
- The beneficial reuse of all wastes generated at the premises are maximised where it is safe and practical to do so; and
- No waste disposal occurs on site except in accordance with an Environment Protection Licence.

The EIS needs to identify the proposed type, quantity and location of wastes to be stored and/or processed at the site. Spill management measures, including items such as bunding, and emergency procedures should be clearly outlined.

The EIS must identify, characterise and classify the following in accordance with the EPA's *Waste Classification Guidelines (2014)* and associated addendums:

- all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste;
- all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling.

The EIS must outline contingency plans for any event that may result in environmental harm, such as excessive stockpiling of material, or dirty water volumes exceeding the storage capacity available on-site.

### **Monitoring**

The EIS must outline the proposed monitoring regime to be implemented in relation to the following potential impacts, where relevant:

- Odour and particulate matter;
- Construction and operational noise;

- Waste classification;
- Wastewater (including surface and groundwater monitoring);
- Effluent and soil quality monitoring.

## **ATTACHMENT B: GENERAL EIS REQUIREMENTS FOR FOGO Composting facility, ANL, Tea Gardens**

### **How to use these requirements**

The EPA requirements have been structured in accordance with the DPE EIS Guidelines, as follows. It is suggested that the EIS follow the same structure:

- A. Executive summary
- B. The proposal
- C. The location
- D. Identification and prioritisation of issues
- E. The environmental issues
- F. List of approvals and licences
- G. Compilation of mitigation measures
- H. Justification for the proposal



## **A Executive summary**

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The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental outcomes.

## **B The proposal**

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### **1. Objectives of the proposal**

- The objectives of the proposal should be clearly stated and refer to:
  - a) the size and type of the operation, the nature of the processes and the products, by-products and wastes produced
  - b) a life cycle approach to the production, use or disposal of products
  - c) the anticipated level of performance in meeting required environmental standards and cleaner production principles
  - d) the staging and timing of the proposal and any plans for future expansion
  - e) the proposal's relationship to any other industry or facility.

### **2. Description of the proposal**

#### ***General***

- Outline the production process including:
  - a) the environmental "mass balance" for the process – quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc)
  - b) any life-cycle strategies for the products.
- Outline cleaner production actions, including:
  - a) measures to minimise waste (typically through addressing source reduction)
  - b) proposals for use or recycling of by-products
  - c) proposed disposal methods for solid and liquid waste
  - d) air management systems including all potential sources of air emissions, proposals to re-use or treat emissions, emission levels relative to relevant standards in regulations, discharge points
  - e) water management system including all potential sources of water pollution, proposals for re-use, treatment etc, emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge.
  - f) soil contamination treatment and prevention systems.
- Outline construction works including:
  - a) actions to address any existing soil contamination
  - b) any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site)
  - c) construction timetable and staging; hours of construction; proposed construction methods
  - d) environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures.
- Include a site diagram showing the site layout and location of environmental controls.

## **Air**

- Identify all sources or potential sources of air emissions from the development.

*Note: emissions can be classed as either:*

- *point (e.g. emissions from stack or vent) or*
  - *fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, conveyors, storage facilities, plant and yard operation, vehicle movements (dust from road, exhausts, loss from load), land clearing and construction works).*
- Provide details of the project that are essential for predicting and assessing air impacts including:
    - a) the quantities and physio-chemical parameters (e.g. concentration, moisture content, bulk density, particle sizes etc) of materials to be used, transported, produced or stored
    - b) an outline of procedures for handling, transport, production and storage
    - c) the management of solid, liquid and gaseous waste streams with potential to generate emissions to air.

## **Noise and vibration**

- Identify all noise sources or potential sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials.
- Specify the times of operation for all phases of the development and for all noise producing activities.
- For projects with a significant potential traffic noise impact provide details of road alignment (include gradients, road surface, topography, bridges, culverts etc), and land use along the proposed road and measurement locations – diagrams should be to a scale sufficient to delineate individual residential blocks.

## **Water**

- Provide details of the project that are essential for predicting and assessing impacts to waters including:
  - a) the quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on <http://www.environment.nsw.gov.au/ieo/index.htm>, using technical criteria derived from *the Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, ANZECC 2000)
  - b) the management of discharges with potential for water impacts
  - c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.
- Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts e.g. effluent ponds) and showing potential areas of modification of contours, drainage etc.
- Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include

water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

- **Waste and chemicals**

Provide details of the quantity and type of both liquid waste and non-liquid waste generated, handled, processed or disposed of at the premises. Waste must be classified according to the EPA's *Waste Classification Guidelines 2014 (as amended from time to time)*

- Provide details of liquid waste and non-liquid waste management at the facility, including:
  - a) the transportation, assessment and handling of waste arriving at or generated at the site
  - b) any stockpiling of wastes or recovered materials at the site
  - c) any waste processing related to the facility, including reuse, recycling, reprocessing (including composting) or treatment both on- and off-site
  - d) the method for disposing of all wastes or recovered materials at the facility
  - e) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility
  - f) the proposed controls for managing the environmental impacts of these activities.
- Provide details of spoil disposal with particular attention to:
  - a) the quantity of spoil material likely to be generated
  - b) proposed strategies for the handling, stockpiling, reuse/recycling and disposal of spoil
  - c) the need to maximise reuse of spoil material in the construction industry
  - d) identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material
  - e) designation of transportation routes for transport of spoil.
- Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- Provide details of the type and quantity of any chemical substances to be used or stored and describe arrangements for their safe use and storage.
- Reference should be made to the guidelines: EPA's *Waste Classification Guidelines 2014 (as amended from time to time)*

## **ESD**

- Demonstrate that the planning process and any subsequent development incorporates objectives and mechanisms for achieving ESD, including:
    - a) an assessment of a range of options available for use of the resource, including the benefits of each option to future generations
- proper valuation and pricing of environmental resources
- b) identification of who will bear the environmental costs of the proposal.

### **3. Rehabilitation**

- Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).

### **4. Consideration of alternatives and justification for the proposal**

- Consider the environmental consequences of adopting alternatives, including alternative:
  - a) sites and site layouts
  - b) access modes and routes
  - c) materials handling and production processes
  - d) waste and water management
  - e) impact mitigation measures
  - f) energy sources
- Selection of the preferred option should be justified in terms of:
  - a) ability to satisfy the objectives of the proposal
  - b) relative environmental and other costs of each alternative
  - c) acceptability of environmental impacts and contribution to identified environmental objectives
  - d) acceptability of any environmental risks or uncertainties
  - e) reliability of proposed environmental impact mitigation measures
  - f) efficient use (including maximising re-use) of land, raw materials, energy and other resources.



## **C The location**

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### **1. General**

- Provide an overview of the affected environment to place the proposal in its local and regional environmental context including:
  - a) meteorological data (e.g. rainfall, temperature and evaporation, wind speed and direction)
  - b) topography (landform element, slope type, gradient and length)
  - c) surrounding land uses (potential synergies and conflicts)
  - d) geomorphology (rates of landform change and current erosion and deposition processes)
  - e) soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils)
  - f) ecological information (water system habitat, vegetation, fauna)
  - g) availability of services and the accessibility of the site for passenger and freight transport.

### **2. Air**

- Describe the topography and surrounding land uses. Provide details of the exact locations of dwellings, schools and hospitals. Where appropriate provide a perspective view of the study area such as the terrain file used in dispersion models.
- Describe surrounding buildings that may effect plume dispersion.
- Provide and analyse site representative data on following meteorological parameters:
  - a) temperature and humidity
  - b) rainfall, evaporation and cloud cover
  - c) wind speed and direction
  - d) atmospheric stability class
  - e) mixing height (the height that emissions will be ultimately mixed in the atmosphere)
  - f) katabatic air drainage
  - g) air re-circulation.

### **3. Noise and vibration**

- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.
- Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.

#### **4. Water**

- Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: <http://www.environment.nsw.gov.au/ieo/index.htm> should be used to identify the agreed environmental values and human uses for any affected waterways. This will help with the description of the local and regional area.

#### **5. Soil Contamination Issues**

- Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination, for example if the site was previously a landfill site or if irrigation of effluent has occurred.

## **D Identification and prioritisation of issues / scoping of impact assessment**

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- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account:
  - a) relevant NSW government guidelines
  - b) industry guidelines
  - c) EISs for similar projects
  - d) relevant research and reference material
  - e) relevant preliminary studies or reports for the proposal
  - f) consultation with stakeholders.
- Provide a summary of the outcomes of the process including:
  - a) all issues identified including local, regional and global impacts (e.g. increased/ decreased greenhouse emissions)
  - b) key issues which will require a full analysis (including comprehensive baseline assessment)
  - c) issues not needing full analysis though they may be addressed in the mitigation strategy
  - d) justification for the level of analysis proposed (the capacity of the proposal to give rise to high concentrations of pollution compared with the ambient environment or environmental outcomes is an important factor in setting the level of assessment).

## **E The environmental issues**

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### **1. General**

- The potential impacts identified in the scoping study need to be assessed to determine their significance, particularly in terms of achieving environmental outcomes, and minimising environmental pollution.
- Identify gaps in information and data relevant to significant impacts of the proposal and any actions proposed to fill those information gaps so as to enable development of appropriate management and mitigation measures. This is in accordance with ESD requirements.

*Note: The level of detail should match the level of importance of the issue in decision making which is dependent on the environmental risk.*

### ***Describe baseline conditions***

- Provide a description of existing environmental conditions for any potential impacts.

### ***Assess impacts***

- For any potential impacts relevant for the assessment of the proposal provide a detailed analysis of the impacts of the proposal on the environment including the cumulative impact of the proposal on the receiving environment especially where there are sensitive receivers.
- Describe the methodology used and assumptions made in undertaking this analysis (including any modelling or monitoring undertaken) and indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the predicted impacts.
- The analysis should also make linkages between different areas of assessment where necessary to enable a full assessment of environmental impacts e.g. assessment of impacts on air quality will often need to draw on the analysis of traffic, health, social, soil and/or ecological systems impacts; etc.
- The assessment needs to consider impacts at all phases of the project cycle including: exploration (if relevant or significant), construction, routine operation, start-up operations, upset operations and decommissioning if relevant.
- The level of assessment should be commensurate with the risk to the environment.

### ***Describe management and mitigation measures***

- Describe any mitigation measures and management options proposed to prevent, control, abate or mitigate identified environmental impacts associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- Proponents are expected to implement a 'reasonable level of performance' to minimise environmental impacts. The proponent must indicate how the proposal meets reasonable levels of performance. For example, reference technology based criteria if available, or identify good practice for this type of activity or development. A 'reasonable level of performance' involves adopting and implementing technology and management practices to achieve certain pollutant emissions levels in economically

viable operations. Technology-based criteria evolve gradually over time as technologies and practices change.

- Use environmental impacts as key criteria in selecting between alternative sites, designs and technologies, and to avoid options having the highest environmental impacts.
- Outline any proposed approach (such as an Environmental Management Plan) that will demonstrate how commitments made in the EIS will be implemented. Areas that should be described include:
  - a) operational procedures to manage environmental impacts
  - b) monitoring procedures
  - c) training programs
  - d) community consultation
  - e) complaint mechanisms including site contacts
  - f) strategies to use monitoring information to improve performance
  - g) strategies to achieve acceptable environmental impacts and to respond in event of exceedences.

## **4. Air**

### ***Describe baseline conditions***

- Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data. .

### ***Assess impacts***

- Identify all pollutants of concern and estimate emissions by quantity (and size for particles), source and discharge point.
- Estimate the resulting ground level concentrations of all pollutants. Where necessary (e.g. potentially significant impacts and complex terrain effects), use an appropriate dispersion model to estimate ambient pollutant concentrations. Discuss choice of model and parameters with the EPA.
- Describe the effects and significance of pollutant concentration on the environment, human health, amenity and regional ambient air quality standards or goals.
- Describe the contribution that the development will make to regional and global pollution, particularly in sensitive locations.
- For potentially odorous emissions provide the emission rates in terms of odour units (determined by techniques compatible with EPA procedures). Use sampling and analysis techniques for individual or complex odours and for point or diffuse sources, as appropriate.

*Note: With dust and odour, it may be possible to use data from existing similar activities to generate emission rates.*

- Reference should be made to relevant guidelines e.g. *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2022); *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (EPA, 2022); *Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006); *Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006)..



### ***Describe management and mitigation measures***

- Outline specifications of pollution control equipment (including manufacturer's performance guarantees where available) and management protocols for both point and fugitive emissions. Where possible, this should include cleaner production processes.
- 

## **5. Noise and vibration**

### ***Describe baseline conditions***

- Determine the existing background (LA90) and ambient (LAeq) noise levels, as relevant, in accordance with the *NSW Noise Policy for Industry*.
- Determine the existing road traffic noise levels in accordance with the *NSW Road Noise Policy*, where road traffic noise impacts may occur.
- The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including:
  - a) details of equipment used for the measurements
  - b) a brief description of where the equipment was positioned
  - c) a statement justifying the choice of monitoring site(s), including the procedure used to choose the site(s), having regards to Fact Sheets A and B of the *NSW Noise Policy for Industry*.
  - d) details of the exact location of the monitoring site and a description of land uses in surrounding areas
  - e) a description of the dominant and background noise sources at the site
  - f) day, evening and night assessment background levels for each day of the monitoring period
  - g) the final Rating Background Level (RBL) value
  - h) graphs of the measured noise levels for each day should be provided
  - i) a record of periods of affected data (due to adverse weather and extraneous noise), methods used to exclude invalid data and a statement indicating the need for any re-monitoring.

### ***Assess impacts***

- Determine the project noise trigger levels for the site. For each identified potentially affected receiver, this should include:
  - a) determination of the project intrusive noise level for each identified potentially affected receiver
  - b) selection and justification of the appropriate amenity category for each identified potentially affected receiver
  - c) determination of the project amenity noise level for each receiver
  - d) determination of the appropriate maximum noise level event assessment (sleep disturbance) trigger level.

- Maximum noise levels during night-time period (10pm-7am) should be assessed to analyse possible affects on sleep. Determine expected noise level and noise character likely to be generated from noise sources during:
  - a) site establishment
  - b) construction
  - c) operational phases
  - d) transport including traffic noise generated by the proposal
  - e) other services.

*Note: The noise impact assessment report should include noise source data for each source in 1/1 or 1/3 octave band frequencies including methods for references used to determine noise source levels. Noise source levels and characteristics can be sourced from direct measurement of similar activities or from literature (if full references are provided).*

- Determine the noise levels likely to be received at the reasonably most affected location(s) (these may vary for different activities at each phase of the development).
- The noise impact assessment report should include:
  - a) a plan showing the assumed location of each noise source for each prediction scenario
  - b) a list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site
  - c) any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc
  - d) methods used to predict noise impacts including identification of any noise models used.
  - e) the weather conditions considered for the noise predictions
  - f) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario
  - g) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived
  - h) an assessment of the need to include modification factors as detailed in Fact Sheet C of the *NSW Noise Policy for Industry*.
- Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional feasible and reasonable mitigation measures.
- The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.
  - a) Where relevant noise/vibration levels cannot be met after application of all feasible and reasonable mitigation measures the residual level of noise impact needs to be quantified
- For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.
- Where blasting is intended an assessment in accordance with the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) should be undertaken. The following details of the blast design should be included in the noise assessment:
  - a) bench height, burden spacing, spacing burden ratio
  - b) blast hole diameter, inclination and spacing

- c) type of explosive, maximum instantaneous charge, initiation, blast block size, blast frequency.

### ***Describe management and mitigation measures***

- Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise. This will include selecting quiet equipment and construction methods, noise barriers or acoustic screens, location of stockpiles, temporary offices, compounds and vehicle routes, scheduling of activities, etc.
- For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers. Appropriate ameliorative measures may include:
  - a) use of alternative transportation modes, alternative routes, or other methods of avoiding the new road usage
  - b) control of traffic (eg: limiting times of access or speed limitations)
  - c) resurfacing of the road using a quiet surface
  - d) use of (additional) noise barriers or bunds
  - e) treatment of the façade to reduce internal noise levels buildings where the night-time criteria is a major concern
  - f) more stringent limits for noise emission from vehicles (i.e. using specially designed 'quite' trucks and/or trucks to use air bag suspension
  - g) driver education
  - h) appropriate truck routes
  - i) limit usage of exhaust brakes
  - j) use of premium muffles on trucks
  - k) reducing speed limits for trucks
  - l) ongoing community liaison and monitoring of complaints
  - m) phasing in the increased road use.

## **4. Water**

### ***Describe baseline conditions***

- Describe existing surface and groundwater quality – an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).

*Note: Methods of sampling and analysis need to conform with an accepted standard (e.g. Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC 2004) or be approved and analyses undertaken by accredited laboratories).*

- Provide site drainage details and surface runoff yield.
- State the ambient Water Quality and River Flow Objectives for the receiving waters. These refer to the community's agreed environmental values and human uses endorsed by the Government as goals for the ambient waters. These environmental values are published on the website: <http://www.environment.nsw.gov.au/ieo/index.htm>. The EIS should state the environmental values listed for the catchment and waterway type relevant to your proposal. NB: A consolidated and approved list of environmental values are not available for groundwater resources. Where groundwater may be affected the EIS should identify appropriate groundwater environmental values and justify the choice.
- State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 *Guidelines for Fresh and Marine Water Quality* (<http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html>) (Note that, as at 2004, the NSW Water Quality Objectives booklets and website contain technical criteria derived from the 1992 version of the ANZECC Guidelines. The Water Quality Objectives remain as Government Policy, reflecting the community's environmental values and long-term goals, but the technical criteria are replaced by the more recent ANZECC 2000 Guidelines). NB: While specific guidelines for groundwater are not available, the ANZECC 2000 Guidelines endorse the application of the trigger values and decision trees as a tool to assess risk to environmental values in groundwater.
- State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries or the NSW Salinity Strategy (DLWC, 2000) (<http://www.environment.nsw.gov.au/salinity/government/nswstrategy.htm>).
- Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e.g. to assess whether a licensed discharge impacts on water quality objectives), then prior agreement from the EPA on the approach and study design must be obtained.
- Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives (i.e. are Water Quality and River Flow Objectives being achieved?). Proponents are generally only expected to source available data and information. However, proponents of large or high risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could include:
  - a) lake or estuary flushing characteristics
  - b) specific human uses (e.g. exact location of drinking water offtake)
  - c) sensitive ecosystems or species conservation values
  - d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc
  - e) an outline of baseline groundwater information, including, but not restricted to, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment
  - f) historic river flow data where available for the catchment.

## **Assess impacts**

- No proposal should breach clause 120 of the *Protection of the Environment Operations Act 1997* (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).
- Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.
- Include a rationale, along with relevant calculations, supporting the prediction of the discharges.
- Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).
- Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).
- Identify any potential impacts on quality or quantity of groundwater describing their source.
- Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.
- Identify impacts associated with the disturbance of acid sulfate soils and potential acid sulfate soils.
- Containment of spills and leaks shall be in accordance with EPA's guidelines section 'Bunding and Spill Management' at <http://www.epa.nsw.gov.au/mao/bundingspill.htm> and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.
- The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives. In particular the following questions should be answered:
  - a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and
  - b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.
- Consult with the EPA as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The EPA will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.

*Note: The assessment of water quality impacts needs to be undertaken in a total catchment management context to provide a wide perspective on development impacts, in particular cumulative impacts.*



- Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.
- Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.
- Reference should be made to relevant guidelines e.g. *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004), *Guidelines for Fresh and Marine Water Quality* ANZECC 2000), *Environmental Guidelines: Use of effluent by Irrigation* (DEC, 2004).

### ***Describe management and mitigation measures***

- Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.
- Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.
- Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.
- Outline pollution control measures relating to storage of materials, possibility of accidental spills (e.g. preparation of contingency plans), appropriate disposal methods, and generation of leachate.
- Describe hydrological impact mitigation measures including:
  - a) site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition)
  - b) minimising runoff
  - c) minimising reductions or modifications to flow regimes
  - d) avoiding modifications to groundwater.
- Describe groundwater impact mitigation measures including:
  - a) site selection
  - b) retention of native vegetation and revegetation
  - c) artificial recharge
  - d) providing surface storages with impervious linings
  - e) monitoring program.
- Describe geomorphological impact mitigation measures including:
  - a) site selection
  - b) erosion and sediment controls
  - c) minimising instream works
  - d) treating existing accelerated erosion and deposition
  - e) monitoring program.
- Any proposed monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DEC 2004).

## **5. Soils and contamination**

### ***Describe baseline conditions***

- Provide any details (in addition to those provided in the location description - Section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination.

### ***Assess impacts***

- Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of:
  - a) disturbing any existing contaminated soil
  - b) contamination of soil by operation of the activity
  - c) subsidence or instability
  - d) soil erosion
  - e) disturbing acid sulfate or potential acid sulfate soils.

### ***Describe management and mitigation measures***

- Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:
  - a) erosion and sediment control measures
  - b) proposals for site remediation – see *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998)
  - c) proposals for the management of these soils – see *Acid Sulfate Soil Manual* (Acid Sulfate Soil Advisory Committee 1998) and *Acid Sulfate Soils Assessment Guidelines* (Acid Sulfate Soil Advisory Committee 1998).

## **6. Waste and chemicals**

### ***Describe baseline conditions***

- Describe any existing waste or chemicals operations related to the proposal.

### ***Assess impacts***

- Assess the adequacy of proposed measures to minimise natural resource consumption and minimise impacts from the handling, transporting, storage, processing and reprocessing of waste and/or chemicals.
- Reference should be made to: the EPA's *Waste Classification Guidelines 2014 (as in force from time to time)*

- If the proposal is an energy from waste facility it must:
  - demonstrate that the proposed operation will comply with the NSW EPA's Energy from Waste Policy Statement;
  - describe of the classes and quantities of waste that would be thermally treated at the facility;
  - demonstrate that waste used as a feedstock in the waste to energy plant would be the residual from a resource recovery process that maximises the recovery of material;
  - detail procedures that would be implemented to control the inputs to the waste to energy plant, including contingency measures that would be implemented if inappropriate materials are identified;
  - detail the location and size of stockpiles of unprocessed and processed recycled waste at the site;
  - demonstrate any waste material (e.g. biochar, ash) produced from the waste to energy facility for land application is fit-for-purpose and poses minimal risk of harm to the environment in order to meet the requirements for consideration of a resource recovery order and /or exemption by the EPA;
  - detail procedures for the management of other solid, liquid and gaseous waste streams;
  - describe how waste would be treated, stored, used, disposed and handled on site, and transported to and from the site, and the potential impacts associated with these issues, including current and future offsite waste disposal methods; and
  - identify the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.

### ***Describe management and mitigation measures***

- Outline measures to minimise the consumption of natural resources.
- Outline measures to avoid the generation of waste and promote the re-use and recycling and reprocessing of any waste.
- Outline measures to support any approved regional or industry waste plans.

## **7. Cumulative impacts**

- Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute.
- Assess the impact of the proposal against the long term air, noise and water quality objectives for the area or region.
- Identify infrastructure requirements flowing from the proposal (e.g. water and sewerage services, transport infrastructure upgrades).
- Assess likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts (e.g. travel demand management strategies).

## **F. List of approvals and licences**

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- Identify all approvals and licences required under environment protection legislation including details of all scheduled activities, types of ancillary activities and types of discharges (to air, land, water).

## **G. Compilation of mitigation measures**

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- Outline how the proposal and its environmental protection measures would be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licences or approvals (e.g. outline of an environmental management plan).
- The mitigation strategy should include the environmental management and cleaner production principles which would be followed when planning, designing, establishing and operating the proposal. It should include two sections, one setting out the program for managing the proposal and the other outlining the monitoring program with a feedback loop to the management program.



## **H. Justification for the Proposal**

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- Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.

## ATTACHMENT C: GUIDANCE MATERIAL

Title	Web address
<b>Relevant Legislation</b>	
<i>Contaminated Land Management Act 1997</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/1997/140">http://www.legislation.nsw.gov.au/#/view/act/1997/140</a>
<i>Environmentally Hazardous Chemicals Act 1985</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/1985/14">http://www.legislation.nsw.gov.au/#/view/act/1985/14</a>
<i>Environmental Planning and Assessment Act 1979</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/1979/203">http://www.legislation.nsw.gov.au/#/view/act/1979/203</a>
<i>Protection of the Environment Operations Act 1997</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/1997/156">http://www.legislation.nsw.gov.au/#/view/act/1997/156</a>
<i>Water Management Act 2000</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/2000/92">http://www.legislation.nsw.gov.au/#/view/act/2000/92</a>
<b>Licensing</b>	
Guide to Licensing	<a href="http://www.epa.nsw.gov.au/licensing/licenceguide.htm">www.epa.nsw.gov.au/licensing/licenceguide.htm</a>
<b>Air Issues</b>	
<b>Air Quality</b>	
Approved methods for modelling and assessment of air pollutants in NSW (2022)	<a href="https://www.epa.nsw.gov.au/your-environment/air/industrial-emissions/approved-methods-for-the-modelling-and-assessment-of-air-pollutants">https://www.epa.nsw.gov.au/your-environment/air/industrial-emissions/approved-methods-for-the-modelling-and-assessment-of-air-pollutants</a>
Approved methods for sampling and analysis of air pollutants in NSW (2022)	<a href="https://www.epa.nsw.gov.au/your-environment/air/industrial-emissions/sampling-analysing-air-emissions">https://www.epa.nsw.gov.au/your-environment/air/industrial-emissions/sampling-analysing-air-emissions</a>
POEO (Clean Air) Regulation 2010	<a href="http://www.legislation.nsw.gov.au/#/view/regulation/2010/428">http://www.legislation.nsw.gov.au/#/view/regulation/2010/428</a>
<b>Noise and Vibration</b>	
NSW Noise Policy for Industry	<a href="http://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)">http://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)</a>
Interim Construction Noise Guideline (DECC, 2009)	<a href="http://www.epa.nsw.gov.au/noise/constructnoise.htm">http://www.epa.nsw.gov.au/noise/constructnoise.htm</a>
Assessing Vibration: a technical guideline (DEC, 2006)	<a href="http://www.epa.nsw.gov.au/noise/vibrationguide.htm">http://www.epa.nsw.gov.au/noise/vibrationguide.htm</a>
NSW Road Noise Policy (DECCW, 2011)	<a href="http://www.epa.nsw.gov.au/your-environment/noise/transport-noise">http://www.epa.nsw.gov.au/your-environment/noise/transport-noise</a>
NSW Rail Infrastructure Noise Guideline (EPA, 2013)	<a href="http://www.epa.nsw.gov.au/your-environment/noise/transport-noise">http://www.epa.nsw.gov.au/your-environment/noise/transport-noise</a>
<b>Human Health Risk Assessment</b>	

Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards (enHealth, 2012)	<a href="http://www.eh.org.au/documents/item/916">http://www.eh.org.au/documents/item/916</a>
<b>Waste, Chemicals and Hazardous Materials and Radiation</b>	
<b>Waste</b>	<a href="http://www.epa.nsw.gov.au/wastestrategy/warr.htm">http://www.epa.nsw.gov.au/wastestrategy/warr.htm</a>
Environmental Guidelines: Solid Waste Landfills (EPA, 2016)	<a href="http://www.epa.nsw.gov.au/waste/landfill-sites.htm">http://www.epa.nsw.gov.au/waste/landfill-sites.htm</a>
Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)	<a href="http://www.epa.nsw.gov.au/resources/waste/envguidlms/industrialfill.pdf">http://www.epa.nsw.gov.au/resources/waste/envguidlms/industrialfill.pdf</a>
EPA's Waste Classification Guidelines 2014	<a href="http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm">http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm</a>
Resource recovery orders and exemptions	<a href="http://www.epa.nsw.gov.au/wasteregulation/orders-exemptions.htm">http://www.epa.nsw.gov.au/wasteregulation/orders-exemptions.htm</a>
European Unions Waste Incineration Directive 2000	<a href="http://ec.europa.eu/environment/archives/air/stationary/wid/legislation.htm">http://ec.europa.eu/environment/archives/air/stationary/wid/legislation.htm</a>
EPA's Energy from Waste Policy Statement	<a href="http://www.epa.nsw.gov.au/wastestrategy/energy-from-waste.htm">http://www.epa.nsw.gov.au/wastestrategy/energy-from-waste.htm</a>
NSW Waste Avoidance and Resource Recovery Strategy 2014-2021	<a href="http://www.epa.nsw.gov.au/wastestrategy/warr.htm">http://www.epa.nsw.gov.au/wastestrategy/warr.htm</a>
<b>Chemicals subject to Chemical Control Orders</b>	
Chemical Control Orders (regulated through the EHC Act )	<a href="http://www.epa.nsw.gov.au/pesticides/CCOs.htm">http://www.epa.nsw.gov.au/pesticides/CCOs.htm</a>
National Protocol - Approval/Licensing of Trials of Technologies for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
National Protocol for Approval/Licensing of Commercial Scale Facilities for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
<b>Water and Soils</b>	
<b>Acid sulphate soils</b>	
Coastal acid sulfate soils guidance material	<a href="http://www.environment.nsw.gov.au/acidsulfatesoil/">http://www.environment.nsw.gov.au/acidsulfatesoil/</a> and <a href="http://www.epa.nsw.gov.au/mao/acidsulfatesoils.htm">http://www.epa.nsw.gov.au/mao/acidsulfatesoils.htm</a>
Acid Sulfate Soils Planning Maps	<a href="http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm">http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm</a>
<b>Contaminated Sites Assessment and Remediation</b>	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	<a href="http://www.epa.nsw.gov.au/clm/planning.htm">http://www.epa.nsw.gov.au/clm/planning.htm</a>
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	<a href="http://www.epa.nsw.gov.au/resources/clm/20110650consultantsglines.pdf">http://www.epa.nsw.gov.au/resources/clm/20110650consultantsglines.pdf</a>

Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	<a href="http://www.epa.nsw.gov.au/resources/clm/auditorqlines06121.pdf">http://www.epa.nsw.gov.au/resources/clm/auditorqlines06121.pdf</a>
Sampling Design Guidelines (EPA, 1995)	<a href="http://www.epa.nsw.gov.au/resources/clm/95059samppgdline.pdf">http://www.epa.nsw.gov.au/resources/clm/95059samppgdline.pdf</a>
National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	<a href="http://www.scew.gov.au/nepms/assessment-site-contamination">http://www.scew.gov.au/nepms/assessment-site-contamination</a>
<b>Soils – general</b>	
Managing land and soil	<a href="http://www.environment.nsw.gov.au/soils/landandsoil.htm">http://www.environment.nsw.gov.au/soils/landandsoil.htm</a>
Managing urban stormwater for the protection of soils	<a href="http://www.environment.nsw.gov.au/stormwater/publications.htm">http://www.environment.nsw.gov.au/stormwater/publications.htm</a>
Landslide risk management guidelines	<a href="http://australiangeomechanics.org/admin/wp-content/uploads/2010/11/LRM2000-Concepts.pdf">http://australiangeomechanics.org/admin/wp-content/uploads/2010/11/LRM2000-Concepts.pdf</a> <a href="http://www.australiangeomechanics.org/resources/downloads/">http://www.australiangeomechanics.org/resources/downloads/</a>
Site Investigations for Urban Salinity (DLWC, 2002)	<a href="http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf">http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf</a>
Local Government Salinity Initiative Booklets	<a href="http://www.environment.nsw.gov.au/salinity/solutions/urban.htm">http://www.environment.nsw.gov.au/salinity/solutions/urban.htm</a>
<b>Water</b>	
Water Quality Objectives	<a href="http://www.environment.nsw.gov.au/ieo/index.htm">http://www.environment.nsw.gov.au/ieo/index.htm</a>
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	<a href="http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html">http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html</a>
Applying Goals for Ambient Water Quality Guidance for Operations Officers - Mixing Zones	Contact the EPA on 131555
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	<a href="http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf">http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf</a>



## APPENDIX B – ESTIMATED DEVELOPMENT COST



# Proposed FOGO Operation - 12 Pindimar Rd Tea Gardens

## Estimated Development Cost

(for development under \$3 million)

Element	Cost (excluding GST)
<b>Demolition, excavation and site preparation</b> Includes clearing vegetation, demolition, excavation and remediation, as well as disposal of any material.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Substructure, columns, external walls and upper floors</b> Substructure is the structurally sound and watertight base upon which to build. Substructure includes all work up to but excluding the lowest floor finish. Columns include internal and external columns from tops to bases, column casings and all protective non-decorative coatings. External walls include structural walls, basement walls, glazed screen walls, any balcony walls and balustrades. Upper floors are the floor structures above the lowest level.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Staircases</b> Structural connections between two or more floor levels or to roof, plant rooms and motor rooms together with associated finishes.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Roof</b> The structurally sound and watertight covering over the building.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Windows, internal walls, doors and screens</b>	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Surface finishes</b> Finishes and decoration applied to internal and external surfaces such as walls, floors and ceilings (e.g., painting, cladding, rendering, carpeting, etc).	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Fitments</b> Includes built-up fitments and fixed items (e.g., joinery, benches, plaques, mirrors, etc). Loose furniture and finishes are not included.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Special equipment</b> Special equipment is fixed equipment that is necessary to the use for which consent is sought.	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Building services</b> Internal and external services necessary for the functioning of the building and property (e.g., stormwater, gas supply, electrical systems, mechanical ventilation, lifts, etc).	Costs captured under DA 9_2021 and MOD 2023_0270
<b>External works</b> Works external to the building other than external building services (e.g., soft landscaping, footpaths, decks, retaining walls, etc).	Costs captured under DA 9_2021 and MOD 2023_0270
<b>Professional fees</b> Professional service fees associated with the design and construction of a development (e.g., architect, project manager, town planning consultant, etc).	\$200,000
<b>Estimated development cost</b> (The sum of the above cost elements, exclusive of GST*)	\$200,000
<b>GST</b>	\$20,000
<b>Estimated development cost plus GST</b>	\$220,000

\* Estimated development cost excludes GST, pursuant to Section 6 of the *Environmental Planning and Assessment Regulation 2021*



## APPENDIX C – STAKEHOLDER CONSULTATION

# Consultation Fact Sheet – No.1



## ANL Tea Gardens – Proposed Enclosed Composting Facility

12 Pindimar Road, Tea Gardens, NSW

### **About Australian Native Landscapes**

Australian Native Landscapes Pty Ltd (ANL) launched in March of 1971 and has directed its growth to become a truly diverse and environmentally conscious organisation. ANL is an Australian owned and operated family business with Patrick & Sharon Soars and their two sons involved in the daily operations of the business.

The period 1980's and 1990's was a period of unparalleled growth in the company's landscape division and set the foundation for ANL's reputation as a supplier of quality horticultural products. This has been continuously reinforced with its supply of organic soil and mulches for the majority of the major large-scale projects undertaken across Sydney. Also in the 80's, the company consolidated its composting operations and invested significantly into the development of a new horticultural products and composting operation at Badgerys Creek.

In 2005, ANL expanded its compost manufacturing footprint with the opening of a regional composting facility in Blayney. This site coordinates both large scale composting and a Land Application Division operating agricultural and vineyard spreaders supplying biosolids or compost to agricultural markets. ANL has had a long history with the Tea Gardens site where between 1976 and 1983 ANL processed and removed forest residues with the then Australian Pine Products who operated the export woodchip plant.

ANL continues to grow into regional markets, including Tea Gardens, with its existing landscape supply and wood waste processing facility.

### **Site Location**

The subject site is located at 12 Pindimar Road, Tea Gardens, on the southern side of Myall Way, and adjacent to the Pindimar Road intersection. The site fronts both Myall Way and Pindimar Roads. The subject site has an area of approximately 42.47 hectares (ha) and falls from the northeast to the southwest by some 10m.

Figure 1 – Project site and surrounds



### **Site History**

The site has been operating since 1932, in one form or another, for the processing of timber products, wood chipping, composting of wood residues and non-putrescible organics, mixing and blending of organic soils and products, landscape material bagging, and bulk landscape material sales and distribution.

### **Existing Site Operations**

The site contains an approved landscape supply operation (and bagging complex), waste wood and timber processing facility (and wood processing shed), together with product stockpile areas, extensive concrete hardstand areas, aerated composting platform, site office and managers residence, weighbridge, onsite water supply, water quality management systems, and extensive perimeter landscaping.

The following existing consents apply to the site:

- DA3264/1988
- DA227/2015
- DA-9/2021

The enclosed building approved by DA-9/2021 will house the proposed FOGO composting activities.



# Consultation Fact Sheet - No.1



## ANL Tea Gardens – Proposed Enclosed Composting Facility

### ***Proposed Food and Garden Waste Composting (FOGO)***

The proposed development seeks to receive and compost up to 50,000tpa of FOGO within an existing approved building on the site. It is proposed to utilise the existing Wood Waste Processing building which is authorised by DA-9/2021 (as amended). The Tea Gardens site is currently approved to receive up to 150,000tpa of wood waste materials which includes the following sources:

- Forestry and sawmill residues
- Urban wood residues
- Non-putrescible organics ie kerbside collected household organics (green bin collection)

The above materials are classified as General Solid Waste (non-putrescible), or Category 1 wastes, as per the NSW EPA Waste Classification Guidelines (2014).

The existing approved building has been designed to manage leachate, noise, and odour.

**Figure 2 - Existing enclosed shed to receive FOGO**



It is proposed to receive 50,000tpa of FOGO, while reducing the amount of Category 1 to 100,000tpa to keep the total received tonnages of organics at 150,000tpa. Therefore, there will be no increase in the amount of organics received onsite per year. Food Organics (FO) is classified as General Solid Waste (putrescible), or Category 2 wastes, which by volume will form less than 10% (or ~5,000 to 8,000tpa) of the total FOGO volume.

### ***Operating Hours***

The hours of operation will remain unchanged. Operating hours are:

Monday to Friday	6am to 6pm
Saturday	8am to 4pm

### ***Traffic***

There is proposed to be no increase in traffic under this proposal as there will be no net increase in material transport to or from the site.

### ***Odour Management***

The proposed Odour Control System (OCS) for the building will be designed for the receipt, shredding, and active phase composting operations, and the ventilation of the building through a purpose built biofilter system.

End product production will occur outside the building following the active phase processes.

### ***Key Contacts***

Patrick Soars - Managing Director, ANL

☎ 0417 780 100 ✉ [patrick@anlscape.com.au](mailto:patrick@anlscape.com.au)

Shaun Smith - Principal Advisor, Wedgetail

☎ 0419 715 665 ✉ [ssmith@wedgetail.com.au](mailto:ssmith@wedgetail.com.au)

Website: [www.anlscape.com.au](http://www.anlscape.com.au)



## Factsheet Distribution List

No	Address	Landholder Name	Delivery Method	Date Supplied	Response Received (Y/N)
1	182 Myall Way, Tea Gardens		Letterbox Drop	15.12.2023	N
2	143 Myall Way, Tea Gardens		Letterbox Drop	15.12.2023	N
3	165 Myall Way, Tea Gardens		Letterbox Drop	15.12.2023	N
4	233 Myall Way Tea Gardens		Letterbox Drop	15.12.2023	N
5	196 Myall Way, Tea Gardens		Post	20.12.2023	N
6	275 Myall Way, Tea Gardens		Post	20.12.2023	N
7	301 Myall Way, Tea Gardens		Letterbox Drop	15.12.2023	N
8	353 Myall Way, Tea Gardens		Post	20.12.2023	N
9	20 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
10	25 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
11	27 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
12	54 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
13	53 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
14	59 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
15	80 Gams Road, Tea Gardens	L K Murphy	Letterbox Drop	15.12.2023	N
16	71 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
17	111 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
18	114 Gams Road, Tea Gardens		Post	20.12.2023	N
19	116 Gams Road, Tea Gardens		Post	20.12.2023	N
20	120 Gams Road, Tea Gardens		Letterbox Drop	15.12.2023	N
21	27 Pindimar Road, Tea Gardens		Letterbox Drop	15.12.2023	N
22	87 Pindimar Road, Tea Gardens		Letterbox Drop	15.12.2023	N



No	Address	Landholder Name	Delivery Method	Date Supplied	Response Received (Y/N)
23	124 Pindimar Road, Tea Gardens	Ingham	Post	20.12.2023	N
24	125 Pindimar Road, Tea Gardens		Letterbox Drop	15.12.2023	N
25	149 Pindimar Road, Tea Gardens		Letterbox Drop	15.12.2023	N
26	183 Pindimar Road, Tea Gardens		Letterbox Drop	15.12.2023	N
27	180 Pindimar Road, Tea Gardens		Post	20.12.2023	N

Note: Refer to below aerial photograph showing the properties that were provided a factsheet.

#### Factsheet Distribution Area



5/12/2023

**Subject:** DA Pre-Lodgement Meeting

**Proposal:** Proposed 50,000tpa enclosed Food & Garden Organics Composting Operation, within an existing approved wood waste processing facility -

**Application No:** PL2023/0055

**Property:** 12 Pindimar Road, Tea Gardens NSW 2324

**Legal Description:** Lot 1 DP 714149

## DA Pre-Lodgement Meeting

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- Property:** 12 Pindimar Road, Tea Gardens NSW
- Proposal:** Proposed 50,000tpa enclosed Food & Garden Organics Composting Operation, within an existing approved wood waste processing facility -
- Meeting Date:** 10am – 5 December 2023
- Attendees:** Council:
- **Adam Matlawski** - Manager Major Assessment and Regulatory Services
  - **Marty Tooze** -
  - **Emily Nicholson** - Senior Environmental Health Officer – Projects and Policies
  - **Laura Blow** – Environmental Health Officer
  - **April McKay** - Environmental Officer Estuary and Water Quality
  - **Trudi Wassell** – Note Taker

### Applicants:

- Patrick Soars – ANL - Managing Director
- Shaun Smith – Digital Project Consulting
- Denis Smith – Planner

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## **The Proposal:**

### **Background**

The site at 12 Pindimar Road, Tea Gardens was purchased by ANL from Boral in 2013. The site has a complex planning history in respect of DAs, Environment Protection Licences, and other works carried out on this site since 1932. ANL currently operates the facility in accordance with Development Consents 3264/1988, DA227/2015, and DA-9/2021. More recently, DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the approved wood waste processing building.

Further detail on the development approved at the site under the above consents is outlined below.

#### **DA3264/1988**

The subject DA approved - *“Wood Chipping Plant”*.

#### **DA227/2015**

The subject DA approved - *“Landscape material supplies, packaging shed and maintenance facility, managers residence and associated works”*.

#### **DA-9/2021 (as amended)**

The subject DA approved - “*Alterations and additions to existing operations, inclusion of wood waste processing and ancillary works*”.

Further detail on each of these consents is provided in **Section 3.2 – Existing Approved Development**.

The subject application seeks approval of a new DA to process up to 50,000tpa of FOGO within the existing approved wood processing building authorised under DA-9/2021. It is proposed to repurpose and retrofit this approved building and operate the FOGO composting operations within this building.

The proposed development will not extend outside of the existing approved disturbance footprint and will be fully contained within Lot 1 DP714149.

Existing key mitigation strategies implemented at the site to avoid or minimise adverse impacts will be developed as part of this application.

## **Proposal**

Due to NSW Government waste targets and initiatives, including the *Waste and Sustainable Materials Strategy 2041* (WaSM), there is a push to have all household food and garden organics diverted from landfill in all LGAs by 2030.

These initiatives are designed to reduce organics waste in landfill, where it generates methane, a potent greenhouse gas, and instead create a clean stream of a valuable resource that can be beneficially reused.

This has created the need for significant additional waste recycling infrastructure and processing capacity in NSW to meet these initiative targets.

The proposal involves the use of an existing approved building at an existing landscape supply yard and wood chipping operation for the receipt and composting of 50,000tpa enclosed Food & Garden Organics Composting Operation (FOGO) to produce organic substrates.

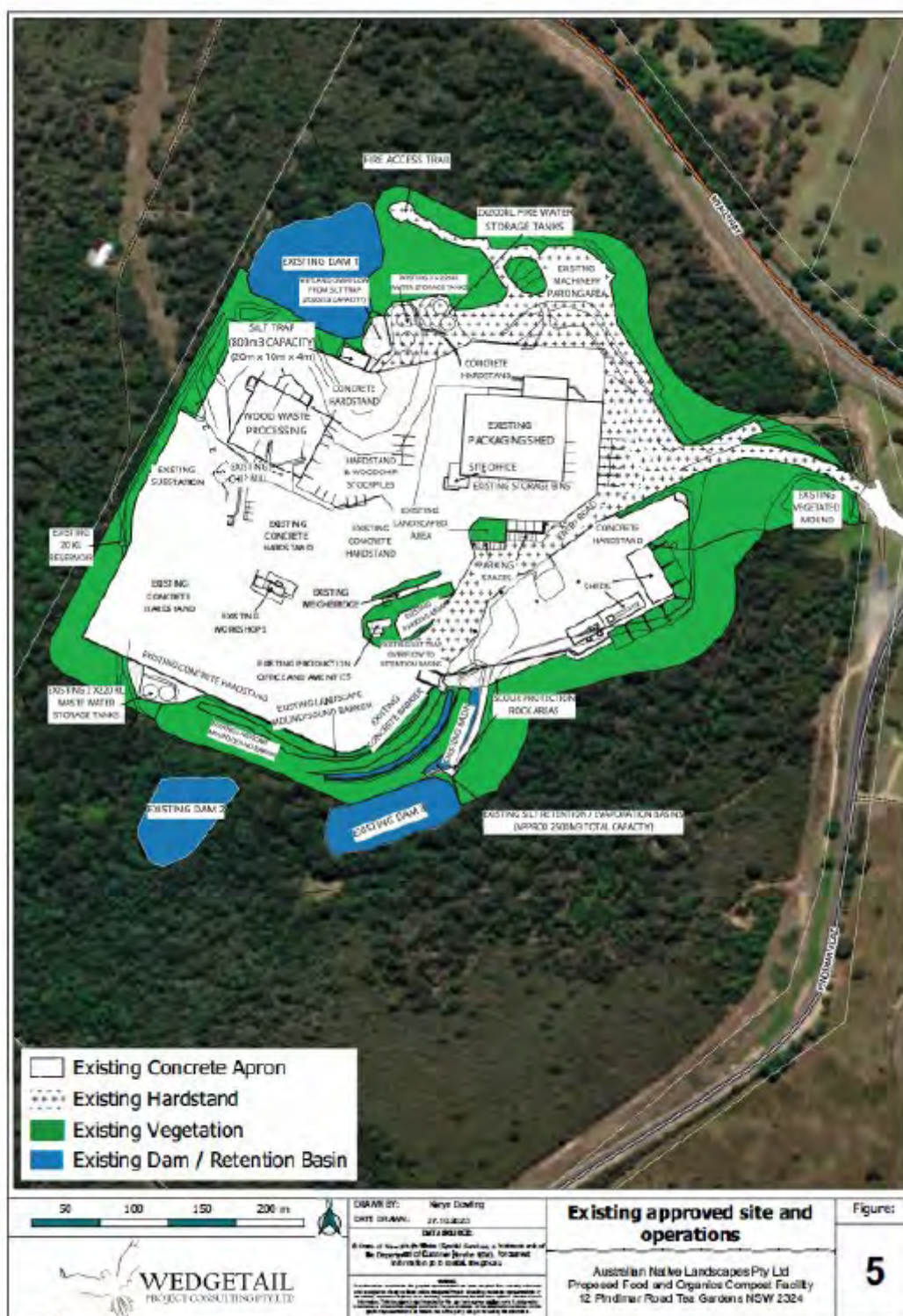
- Existing capacity is 150,000 tonnes of category 1 material approved.
- Propose to accept Category 2 material, mixed food organics and green waste from kerbside collections. Looking to bin ring FOGO
- Small modification on the shed.
- Approved water management strategy in place.
- Brown field site operating for a number of years.
- No increase in traffic.
- Work within existing 150,000 tonne approval.
- Staff numbers will increase by 3 extra employees.
- Resource recovery, Fogo driving the project.











1. **Planning controls**- LEP, SEPP, DCP
2. **Key issues**- Noise, odour, traffic, drainage, EPA
3. **Planning**- Adam Matlawski - Manager Major Assessment and Regulatory Services
  - Development is permissible on site.
  - EPA is licencing this activity and will be involved in the site assessment.
  - Council perspective is that green waste element was the primary use and part of the consent issued for the wood processing.
  - The operators position on this is noted and taken on notice. The proposed activities subject to this future development application will provide the opportunity to address this.
  - Will need to work with appropriate regulatory authority, the EPA, regarding odour, noise and ensure it is considered in this proposal.
  - Staying within the tonnage is beneficial, no increase in truck movements, road condition and infrastructure delivery will work well with the community concerns.
  - Ensuring the supplementary information supports the application.
  - The need for FOGO processing is understood, Council staff acknowledge there is a market gap in dealing with the material.
  - If the operations can be established within SEPP, EPA and deal with local concerns it will be relatively straight forward.
  - If there are assessments regarding noise, machinery, dust ensure you include and reference those perspectives to address community concerns.
  - Ensure consent is aligned with any issues highlighted by the EPA.
4. **Engineering** - Marty Tooze - Development Engineer
  - No engineering considerations or matters to raise to applicant due to existing infrastructure already in place.
5. **Water Quality**- April Mckay - Environmental Officer Estuary and Water Quality

If the proposed FOGO processing system will be housed within the existing approved shed there will be no additional water quality treatment required.

However, in noting this, the revised report should address any runoff generated by this proposal and if the quality of the runoff differs from that generated by wood processing. Any differences between runoff generated should be considered and addressed in the submission.
6. **Water and Sewer/OSSM** - Nil
7. **Building**- Nil

8. **Environmental Health - Emily Nicholson - Senior Environmental Health Officer – Projects and Policies – Laura Blows – Environmental Officer.**

Council would require to ensure all water is being appropriately treated and managed.

Water Quality comments align with the considerations of the EHO team in regard to water capture and treatment. Specific consideration needs to be given to the stockpiling of materials – this appears to be a currently practise and it is understood that this will continue.

The applicants initial advice is noted about this issue - the applicant explained the waste water/leachate from the FOGO processing within the building is to be fully contained in an enclosed system, and any leachate/waste water from the external piles is captured in dams and reused onsite.

#### **6.1.4 Surface Water and Leachate Management**

The existing site operates under Environment Protection Licence 3877 (EPL 3877). Activities operate under a scenario in which no stormwater runoff leaves disturbed sections of the site under normal operating and weather conditions. Runoff is collected and stored onsite in three (3) dams in order to comply with Condition L1.1 of EPL3877. The stored water is used for a variety of purposes including dust suppression and wetting down of material stockpiles in accordance with Condition O3.1 of the EPL. Any additional water not used for these purposes is utilised for onsite irrigation, in order to draw down dam storage levels and limit site discharges.

The current proposal is situated within the footprint of the existing operations area and will generally utilise the existing drainage and treatment measures, with some supplementations to manage and contain leachate captured from the FOGO composting building.

The operations area contains three (3) catchments directing flow towards three (3) dams located within the site. All water is captured, treated, and reused for the various operations across the site.

The existing water sensitive design strategy was prepared in 2021 for DA-9/2021 by Tattersall Landers Development Consultants. It is proposed to amend the drainage design and existing report, where required, to integrate any new requirements for the composting of FOGO.

- Noise and odour risks, Air quality impact assessment will be required.
  - Noise impact assessment will be required to ensure appropriate mitigation measures are in place.
  - Both those reports would be required by the EPA.
  - Managing Leaf shape drainage
  - Current water management system on site. Water management system will need to be outlined to ensure that there is capability to deal with the waste.
9. **Ecology**- Nil
10. **Issues/Additional Questions** - Nil

## **11. Follow up requirements:**

### **Important Information**

Please refer to Council's Electronic Submission Requirements for Plans, Reports and other documents, the Application Guide for Lodgement and associated DA Checklist (available from Council's website) when preparing your application.

Please note this advice has been prepared on the basis of the information and concept plans that have been submitted to Council for this meeting. Other issues may arise following a detailed assessment of any application lodged.

Furthermore, any application that is lodged shall be assessed on its merits and shall have regard for, and be designed in accordance with, the relevant planning controls (including any state or local environmental planning instruments) precinct plans, development control plans or policies, and the National Construction Code and relevant standards.

Any information submitted for Pre-Lodgement meetings as well as any correspondence to or from Council, including this letter, may be disclosed under the provisions of the GIPA Act.

The views expressed may vary once detailed plans and information are submitted and formally assessed by Council, or as a result of issues raised by interested parties.

These comments do not bind Council Officers, the elected Council members, or other bodies beyond Council, in any way whatsoever.



## Government Consultation Log

Agency	Date	Contact Details	Method of Engagement	Comment / Outcome
Mid Coast Council	5.12.2023	Adam Matlawski – Manager Major Assessments and Regulatory Services <a href="mailto:adam.matlawski@midcoast.nsw.gov.au">adam.matlawski@midcoast.nsw.gov.au</a>	Pre-lodgement meeting by Teams prior to requesting SEARs	Refer to attached Council pre-lodgement meeting minutes
Department of Planning, Housing, and Infrastructure	11.1.2024	Elke Tuckfield – Planning and Assessment Officer <a href="mailto:elke.tuckfield@dpie.nsw.gov.au">elke.tuckfield@dpie.nsw.gov.au</a>	SEARs	No further comments received
Environment Protection Authority	14.12.2023	Simon Tylor – Unit Head <a href="mailto:simon.taylor@epa.nsw.gov.au">simon.taylor@epa.nsw.gov.au</a>	SEARs	No further comments received
Environment Protection Authority	27.6.2024	Amy Hull – Operations Officer <a href="mailto:amy.hill@epa.nsw.gov.au">amy.hill@epa.nsw.gov.au</a>	Site Inspection	ANL provided an overview of the existing operations, onsite water management, and the proposed FOGO operations within the approved wood waste building.



## **APPENDIX D – PROJECT ENVIRONMENTAL RISK ASSESSMENT**





## APPENDIX D – PROJECT ENVIRONMENTAL RISK ASSESSMENT

Issue	Aspect	Impact	Risk Assessment Ranking			Environmental Impact Statement Scope
			C	L	R	
Traffic and Access	Vehicle movements from employees, and in-bound and out-bound deliveries during operations.	Increased traffic movements  Safety interactions of Pindimar Road, Myall Way, and M1 Pacific Motorway	Mod	2	6, Mod	Currently the site is approved to process up to 150,000tpa of materials which equates to approximately 45 truck movements per day. As there will be no net increase in the volume of materials to be received onsite, heavy vehicle movements will remain unchanged.  A Traffic Impact Assessment has been undertaken for the Project in accordance with the 'Guide to Traffic Generating Developments' (RTA 2002).  The assessment considered operational traffic types, volumes and movements on site and existing road networks.
Air Quality	Vehicle movements	Elevated airborne, deposited dust and odour emissions	Mod	2	6, Mod	There will be no net increase to truck movements under this application. There is also no additional plant and equipment proposed under this application.
	Operation of plant and equipment		Mod	2	6, Mod	An Air Quality Impact Assessment has been undertaken for the Project in accordance with the <i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales</i> (DEC, 2005).  The Assessment included confirmation of background levels, determination of site criteria, air quality impacts for the operational phases, and cumulative impacts.  Mitigation and management measures have been developed to reduce the impacts on air quality.
Noise and Vibration	Vehicle movements		Minor	2	4, Mod	No construction activities are proposed under this application. All construction activities are approved under DA-9/2021.

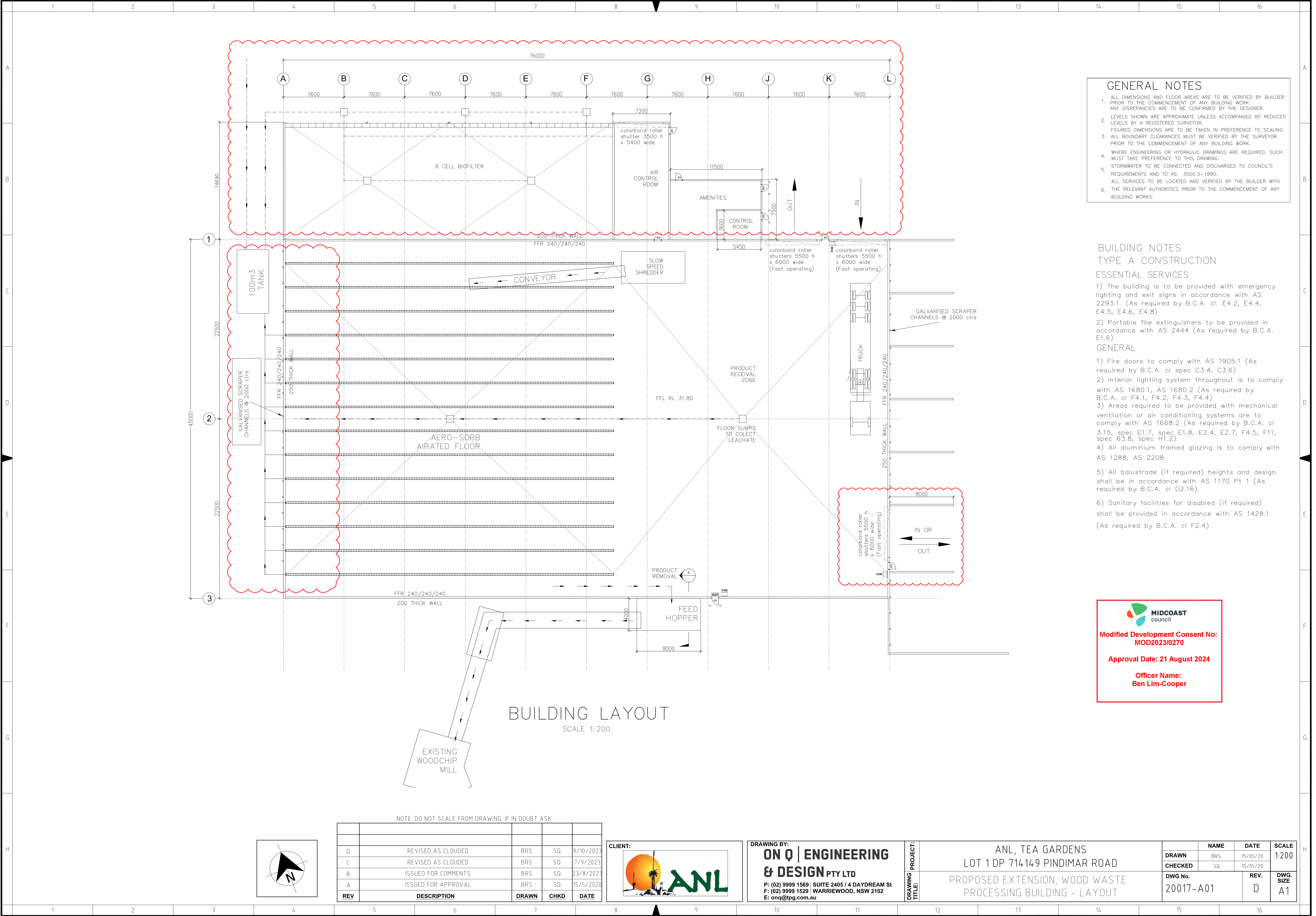
Issue	Aspect	Impact	Risk Assessment Ranking			Environmental Impact Statement Scope
			C	L	R	
	Receival, consolidation, and composting of organics	Excessive noise and vibration generation at sensitive receivers	Minor	2	4, Mod	<p>There will be no net increase to truck movements under this application. There is also no additional plant and equipment under this application.</p> <p>A Noise and Vibration Impact Assessment has been undertaken for the Project in accordance with relevant NSW regulatory policy and guidelines, including the <i>Industrial Noise Policy 2000</i>, <i>Interim Construction Noise Guidelines</i> and <i>Road Noise Policy</i>.</p> <p>The Assessment determined likely criteria for the Project and included an assessment of operational noise and vibration impacts, and cumulative noise impacts with other approved industry in the vicinity.</p> <p>Mitigation and management measures have been developed to reduce the noise and vibration impacts of the project.</p>
Surface, Ground Water, and Leachate	Release of sediment and leachate	Sediment and leachate movement resulting in contamination of nearby surface water and groundwater	Mod	2	6, Mod	<p>No construction activities proposed under this application. Surface water was previously assessed as part of DA-9/2021. Notwithstanding this, the assessment has been updated for this application.</p> <p>This included a review of the existing assessment report, the identification of surface and groundwater resources, assessment of existing surface and groundwater hydrology, and an assessment of potential surface water and groundwater impacts on and offsite. The assessment also included the development of a revised site water balance and management protocol.</p> <p>Measures have been developed to mitigate and or manage potential surface and groundwater issues.</p>
Aboriginal Cultural Heritage	Disturbance of unknown Aboriginal artefacts	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	High	1	4, Mod	<p>No ground disturbance proposed under this application. Notwithstanding this, a due diligence assessment and consultation has been undertaken as part of this application.</p> <p>A qualified archaeologist completed desktop searches of Department Climate Change, Energy, the Environment &amp; Water (DCCEEW) AHIMS database. This data will be plotted, and any necessary site cards or reports were obtained prior to field investigation. Due to no disturbance being proposed under this application an Aboriginal Due Diligence Assessment was undertaken.</p>

Issue	Aspect	Impact	Risk Assessment Ranking			Environmental Impact Statement Scope
			C	L	R	
						Field survey assessment has been conducted with members of the local Aboriginal land council.  Mitigation and management strategies have been developed in the event an Aboriginal artefact is discovered.
Historic Heritage	Construction impacts to Heritage items of significance	Impact to historic heritage of local or state significance	Mod	1	3, Low	No construction activities proposed under this application. Notwithstanding this a historic heritage assessment has been prepared.  There are no listed items within the Project area, nor within 5km of the site.
Fire and Incident Management	Threat to workers	Threat from bushfire to worker safety	High	2	8, Mod	A Bushfire Threat Assessment was previously prepared for DA-9/2021. This report has been updated to include incident management.  The proposed development can meet the performance criteria for acceptable solutions for commercial development, giving due regard to the requirements of Chapter 8 of PBP 2019, specifically section 8.3.1.  A suitable package of bushfire protection measures has been developed that is commensurate with the assessed level of risk to the development.
Biodiversity	Disturbance to biodiversity from ground clearance during construction	Disturbance to State and Federally listed species, communities, or habitat for species	High	1	4, Mod	No construction activities are proposed under this application. Biodiversity previously assessed as part of DA-9/2021 for the building and related ground disturbance.
Visual Amenity	Visibility of the development	Impact to visual amenity of existing environment	Minor	1	2, Low	No additional buildings proposed as part of this application. Notwithstanding this a visual assessment has been prepared.  The assessment consisted of a desktop review – aerial photography, proposed works, existing reports, and planning policy. In addition, a field inspection was undertaken to determine the visibility of the proposed project at a local context. The site is highly shielded from surrounding receivers due to the topography of the site and the considerable boundary landscaping.
Socio-economic	Social	Demands on local infrastructure and services, impacts to demographics	Neg	2	2, Low	A desktop Socio-Economic Assessment of the Project has been undertaken as part of the overall EIS. The economic benefits of the Project have been considered, in addition to the potential social impacts. It is considered that

Issue	Aspect	Impact	Risk Assessment Ranking			Environmental Impact Statement Scope
			C	L	R	
						the economic benefits far exceed any social impacts that would result from the development.
Waste Management	Generation of general waste	Land contamination	Minor	1	2, Low	<p>A Waste Management Plan has been prepared as part of the EIS. The management plan details control measures to be implemented. Details of how waste will be stored, handled (including inappropriate waste) and transported to and from site were also detailed.</p> <p>Mitigation and management measures have been proposed to reduce the impacts associated with waste management on site and ensure compliance with regulatory and statutory requirements and ensure consistency with the aims, objectives and guidance in the <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-2021</i>.</p>
Cumulative Impacts	Operations	Cumulative impacts on existing receivers	Minor	1	2, Mod	<p>No construction activities are proposed under this application. All composting activities are to be undertaken within a fully enclosed building with an odour treatment system (biofilter).</p> <p>All studies incorporate cumulative impacts assessments, where sufficient information was available.</p>



## **APPENDIX E – APPROVED BUILDING PLANS UNDER DA-9/2021 (AND AS MODIFIED)**



GENERAL NOTES

- ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERIFIED BY BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK. ANY DISCREPANCIES ARE TO BE CONFIRMED BY THE DESIGNER.
- LEVELS SHOWN ARE APPROXIMATE, UNLESS ACCOMPANIED BY REDUCED LEVELS BY A REGISTERED SURVEYOR. FIGURED DIMENSIONS ARE TO BE TAKEN IN PREFERENCE TO SCALING.
- ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
- WHERE ENGINEERING OR HYDRAULIC DRAWINGS ARE REQUIRED, SUCH MUST TAKE PREFERENCE TO THIS DRAWING.
- STORMWATER TO BE CONNECTED AND DISCHARGED TO COUNCIL'S REQUIREMENTS AND TO AS 3500.3-1990.
- ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH THE RELEVANT AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS.

BUILDING NOTES  
TYPE A CONSTRUCTION  
ESSENTIAL SERVICES

- The building is to be provided with emergency lighting and exit signs in accordance with AS 2293.1. (As required by B.C.A. cl. E4.2, E4.4, E4.5, E4.6, E4.8)
- Portable fire extinguishers to be provided in accordance with AS 2444 (As required by B.C.A. E1.6).

GENERAL

- Fire doors to comply with AS 1905.1 (As required by B.C.A. cl spec C3.4, C3.6)
- Interior lighting system throughout is to comply with AS 1680.1, AS 1680.2 (As required by B.C.A. cl F4.1, F4.2, F4.3, F4.4)
- Areas required to be provided with mechanical ventilation or air conditioning systems are to comply with AS 1668.2 (As required by B.C.A. cl 3.15, spec E1.7, spec E1.8, E2.4, E2.7, F4.5, F11, spec 63.8, spec H1.2).
- All aluminium framed glazing is to comply with AS 1288, AS 2208
- All balustrade (if required) heights and design shall be in accordance with AS 1170 Pt 1 (As required by B.C.A. cl D2.16).
- Sanitary facilities for disabled (if required) shall be provided in accordance with AS 1428.1 (As required by B.C.A. cl F2.4)



Modified Development Consent No:  
**MOD2023/0270**

Approval Date: **21 August 2024**

Officer Name:  
**Ben Lim-Cooper**

NOTE: DO NOT SCALE FROM DRAWING. IF IN DOUBT ASK

REV	DESCRIPTION	DRAWN	CHKD	DATE
D	REVISED AS CLOUDED	BRS	SQ	9/10/2023
C	REVISED AS CLOUDED	BRS	SQ	7/9/2023
B	ISSUED FOR COMMENTS	BRS	SQ	23/8/2023
A	ISSUED FOR APPROVAL	BRS	SQ	15/5/2020

CLIENT:



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**ON Q | ENGINEERING  
& DESIGN PTY LTD**

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F: (02) 9999 1529 | WARRIEWOOD, NSW 2102  
E: onq@tpg.com.au

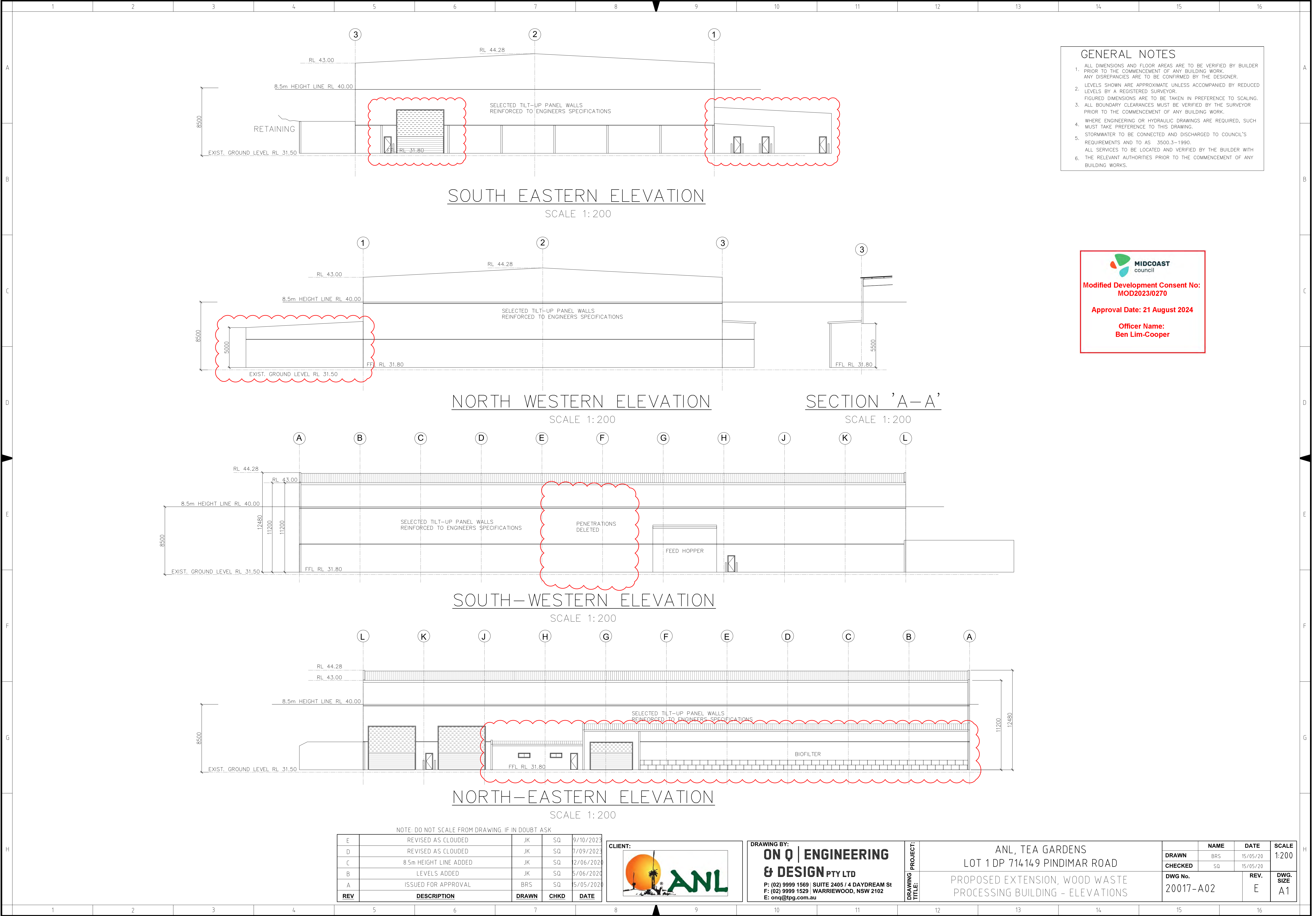
DRAWING PROJECT:

TITLE:

ANL, TEA GARDENS  
LOT 1 DP 714149 PINDIMAR ROAD  
PROPOSED EXTENSION, WOOD WASTE  
PROCESSING BUILDING - LAYOUT

DRAWN	NAME	DATE	SCALE
CHECKED	BRS	15/05/20	1:200
DWG No.	REV.	DWG. SIZE	
20017-A01	D	A1	





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**Modified Development Consent No:**  
**MOD2023/0270**

**Approval Date: 21 August 2024**

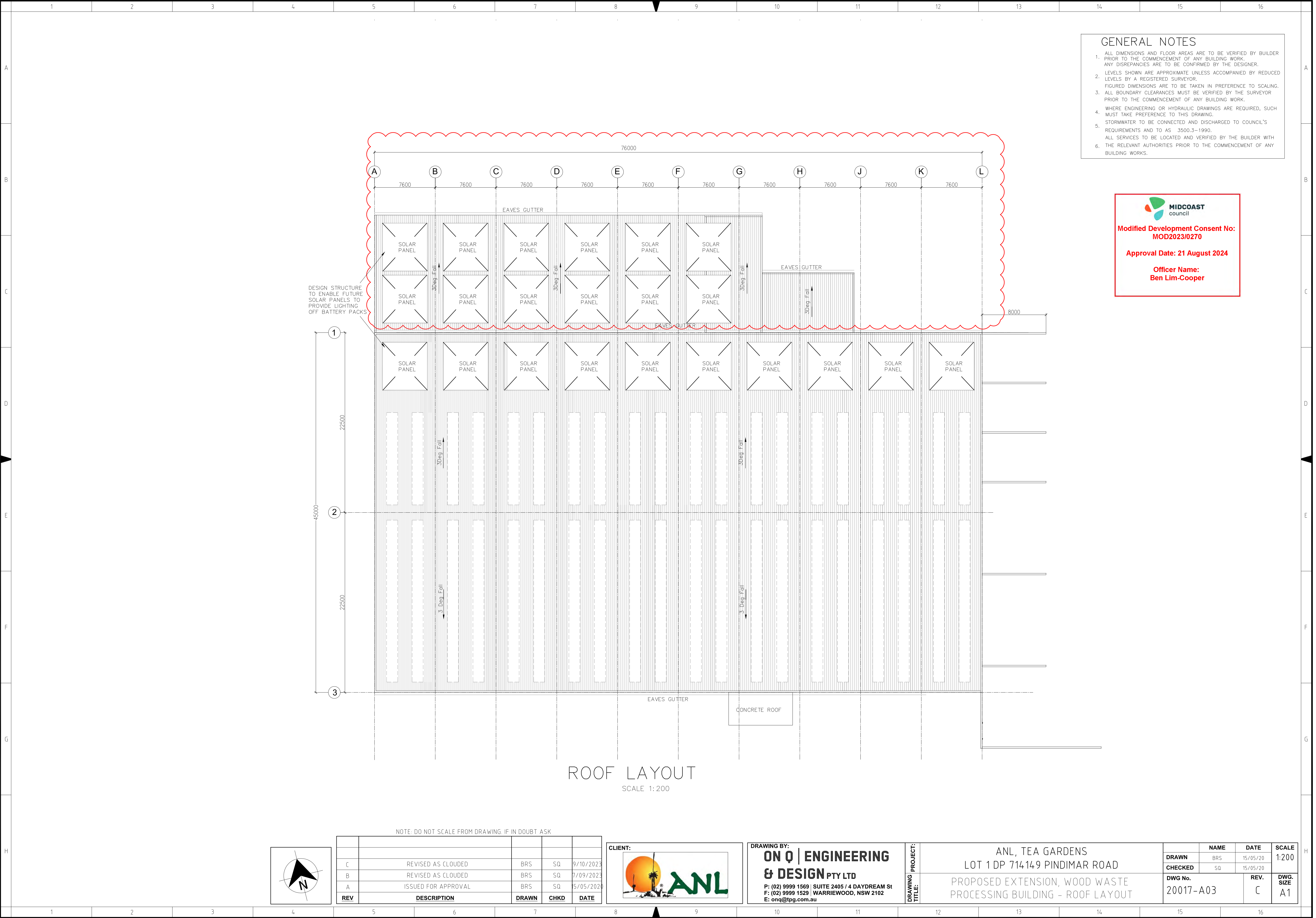
**Officer Name:**  
**Ben Lim-Cooper**

NOTE: DO NOT SCALE FROM DRAWING. IF IN DOUBT ASK				
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D	REVISED AS CLOUDED	JK	SQ	7/09/2023
C	8.5m HEIGHT LINE ADDED	JK	SQ	2/06/2020
B	LEVELS ADDED	JK	SQ	5/06/2020
A	ISSUED FOR APPROVAL	BRS	SQ	5/05/2020
REV	DESCRIPTION	DRAWN	CHKD	DATE



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E: onq@tpg.com.au

DRAWING PROJECT: DRAWING TITLE:	ANL, TEA GARDENS LOT 1 DP 714149 PINDIMAR ROAD			NAME BRS	DATE 15/05/20	SCALE 1:200
	PROPOSED EXTENSION, WOOD WASTE PROCESSING BUILDING - ELEVATIONS			CHECKED SQ	15/05/20	
	DWG No. 20017-A02			REV. E	DWG. SIZE A1	



GENERAL NOTES

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Modified Development Consent No:  
MOD2023/0270

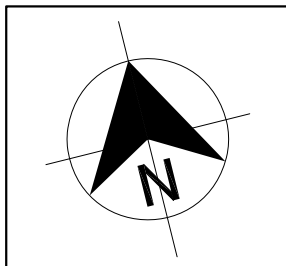
Approval Date: 21 August 2024

Officer Name:  
Ben Lim-Cooper

ROOF LAYOUT  
SCALE 1:200

NOTE: DO NOT SCALE FROM DRAWING. IF IN DOUBT ASK

REV	DESCRIPTION	DRAWN	CHKD	DATE
C	REVISED AS CLOUDED	BRS	SQ	9/10/2023
B	REVISED AS CLOUDED	BRS	SQ	7/09/2023
A	ISSUED FOR APPROVAL	BRS	SQ	5/05/2020



CLIENT:



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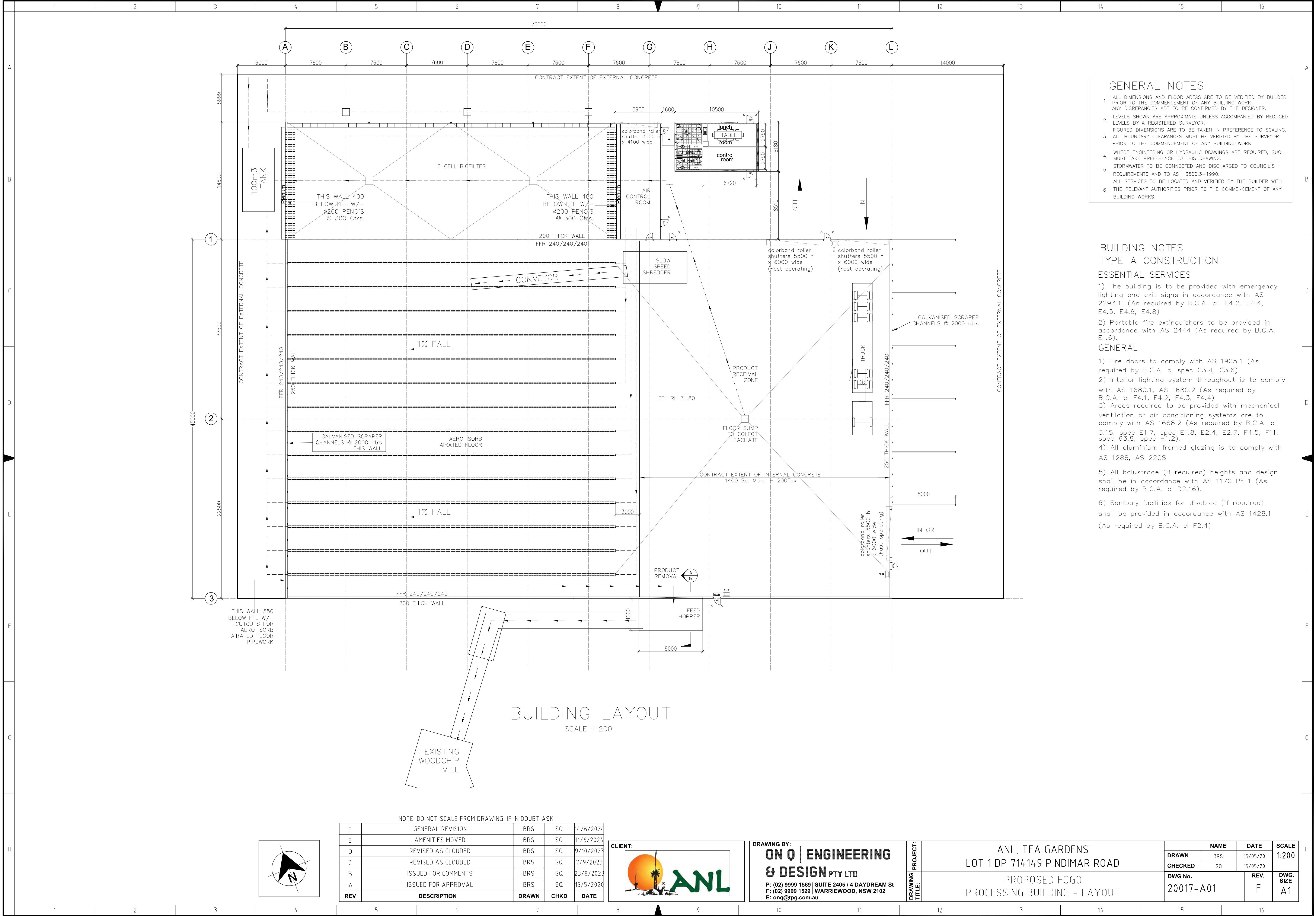
ANL, TEA GARDENS  
LOT 1 DP 714149 PINDIMAR ROAD  
PROPOSED EXTENSION, WOOD WASTE  
PROCESSING BUILDING - ROOF LAYOUT

DRAWN	CHECKED	NAME	DATE	SCALE
BRS	SQ		15/05/20	1:200
DWG No.	REV.	DWG. SIZE		
20017-A03	C	A1		



## APPENDIX F – PROPOSED FOGO OPERATIONS





- GENERAL NOTES**
- ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERIFIED BY BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK. ANY DISCREPANCIES ARE TO BE CONFIRMED BY THE DESIGNER.
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**BUILDING NOTES**  
**TYPE A CONSTRUCTION**  
**ESSENTIAL SERVICES**

- The building is to be provided with emergency lighting and exit signs in accordance with AS 2293.1. (As required by B.C.A. cl. E4.2, E4.4, E4.5, E4.6, E4.8)
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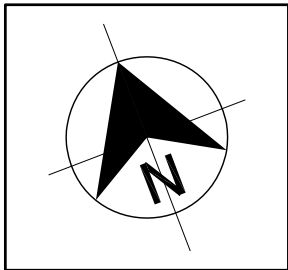
**GENERAL**

- Fire doors to comply with AS 1905.1 (As required by B.C.A. cl spec C3.4, C3.6)
- Interior lighting system throughout is to comply with AS 1680.1, AS 1680.2 (As required by B.C.A. cl F4.1, F4.2, F4.3, F4.4)
- Areas required to be provided with mechanical ventilation or air conditioning systems are to comply with AS 1668.2 (As required by B.C.A. cl 3.15, spec E1.7, spec E1.8, E2.4, E2.7, F4.5, F11, spec 6.3.8, spec H1.2).
- All aluminium framed glazing is to comply with AS 1288, AS 2208
- All balustrade (if required) heights and design shall be in accordance with AS 1170 Pt 1 (As required by B.C.A. cl D2.16).
- Sanitary facilities for disabled (if required) shall be provided in accordance with AS 1428.1 (As required by B.C.A. cl F2.4)

**BUILDING LAYOUT**  
SCALE 1:200

NOTE: DO NOT SCALE FROM DRAWING. IF IN DOUBT ASK

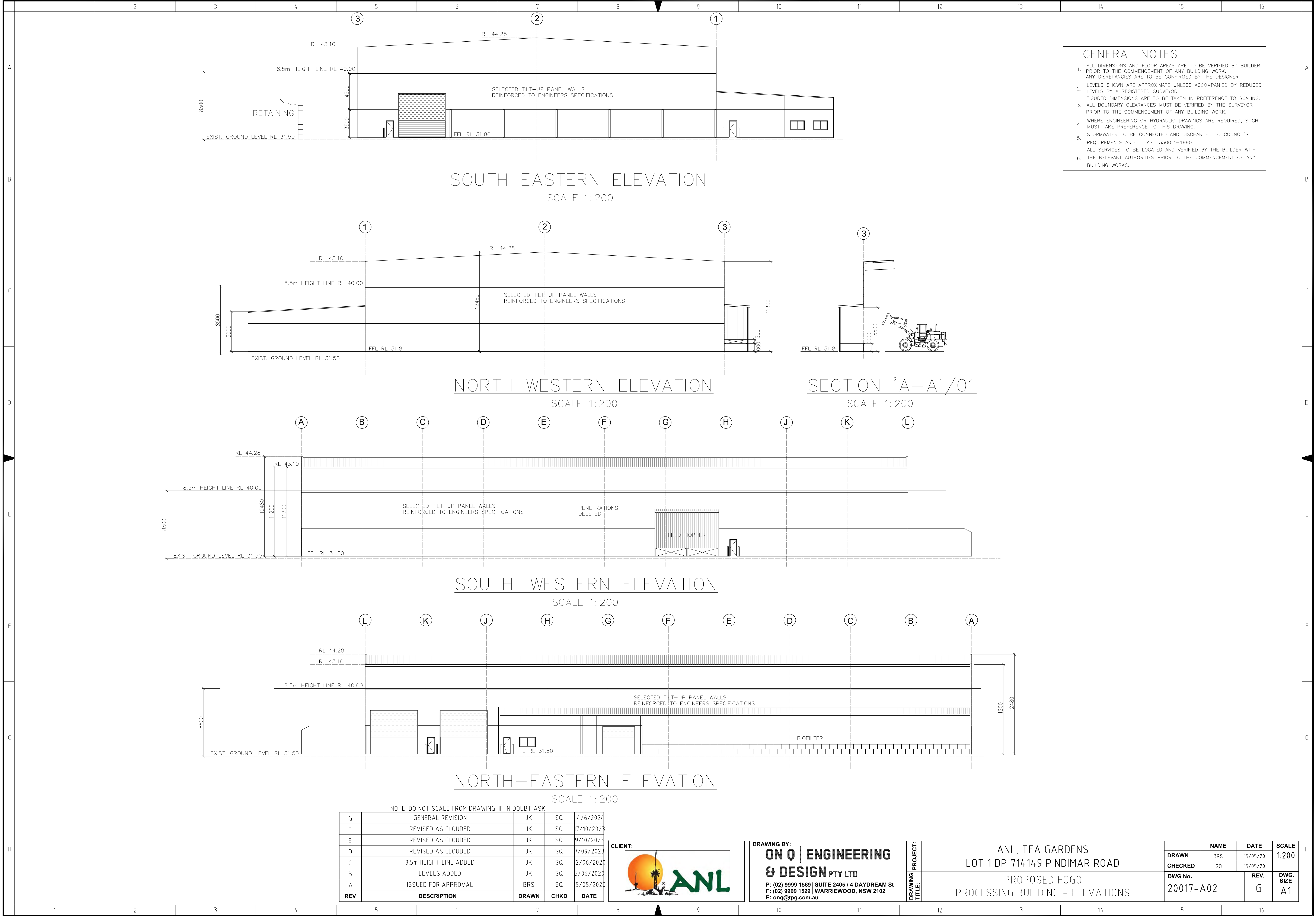
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C	REVISED AS CLOUDED	BRS	SQ	7/9/2023
B	ISSUED FOR COMMENTS	BRS	SQ	23/8/2023
A	ISSUED FOR APPROVAL	BRS	SQ	15/5/2020
REV	DESCRIPTION	DRAWN	CHKD	DATE



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DRAWING PROJECT:  
ANL, TEA GARDENS  
LOT 1 DP 714149 PINDIMAR ROAD  
PROPOSED FOGO  
PROCESSING BUILDING - LAYOUT

DRAWN	CHECKED	DWG No.	NAME	REV.	SCALE
BRS	SQ	20017-A01	F	F	1:200
DATE	DATE	DWG. SIZE			
15/05/20	15/05/20	A1			



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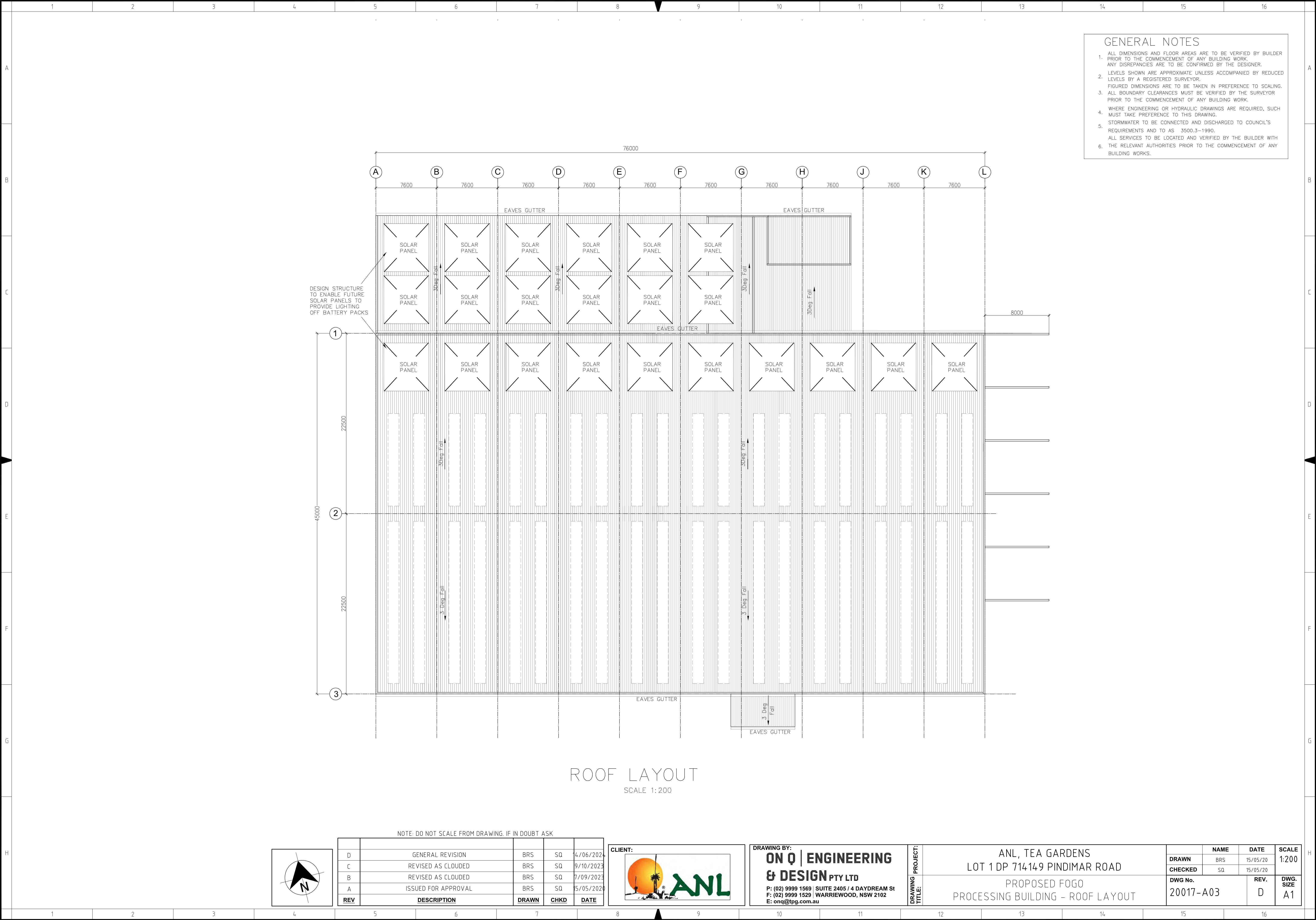
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DRAWING PROJECT:  
TITLE:

ANL, TEA GARDENS  
LOT 1 DP 714149 PINDIMAR ROAD  
PROPOSED FOGO  
PROCESSING BUILDING - ELEVATIONS

NAME		DATE	SCALE
DRAWN	BRS	15/05/20	1:200
CHECKED	SQ	15/05/20	
DWG No.	REV.		DWG. SIZE
20017-A02	G		A1





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ROOF LAYOUT  
SCALE 1:200

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REV	DESCRIPTION	DRAWN	CHKD	DATE
D	GENERAL REVISION	BRS	SQ	14/06/2024
C	REVISED AS CLOUDED	BRS	SQ	9/10/2023
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DRAWING PROJECT:  
TITLE:

ANL, TEA GARDENS  
LOT 1 DP 714149 PINDIMAR ROAD  
PROPOSED FOGO  
PROCESSING BUILDING - ROOF LAYOUT

DRAWN	NAME	DATE	SCALE
BRS	BRS	15/05/20	1:200
CHECKED	NAME	DATE	SCALE
SQ	SQ	15/05/20	1:200
DWG No.	REV.	DWG. SIZE	
20017-A03	D	A1	





## APPENDIX G – TRAFFIC IMPACT ASSESSMENT

Proposed FOGO Facility  
at Existing Wood Waste Facility

**12 Pindimar Road,  
Tea Gardens**

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**TRAFFIC AND PARKING ASSESSMENT REPORT**

29 May 2024

Ref 23465

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## 1.0 INTRODUCTION

### 1.1 Project Summary

This report has been prepared to accompany an Environmental Impact Statement (EIS) to process up to 50,000 tonnes per annum (tpa) of mixed Food and Garden Organics (FOGO) within the existing approved wood processing building at the existing ANL facility which is located at 12 Pindimar Road, Tea Gardens (Figures 1 and 2).

The site comprises an existing landscape supply and wood waste processing facility that has been operating in one form or another since 1932. The site has previously been granted development consent for the construction and operation of a landscape materials supply and wood waste processing facility under Development Consents DA3264/1988, DA227/2015, and DA-9/2021.

The site currently has approval to accept and process 150,000tpa of forestry residues, urban wood residue and non-putrescible organics.

The proposed development will involve the use of the existing approved building wood waste processing for the receipt and composting of up to 50,000tpa of FOGO to produce organic substrates.

The approved amount of wood waste materials received is to be reduced to 100,000tpa, to keep the total received tonnages of organics at 150,000tpa, consistent with the existing approval.

Consequently, there will be no increase in the annual intake of organics.

The purpose of the development is to assist local councils and the NSW Government in meeting the target of having all household food and garden organics diverted from landfill in all LGAs by 2030.

There will be *no change* to the existing staff numbers, associated operating hours, or the amount of organics received onsite per year.

As such, the proposed development is not expected to result in any appreciable change in the approved traffic and parking demands generated by the site.

No change is proposed to the off-street car parking which will continue to be provided for a total of 28 cars throughout the site.

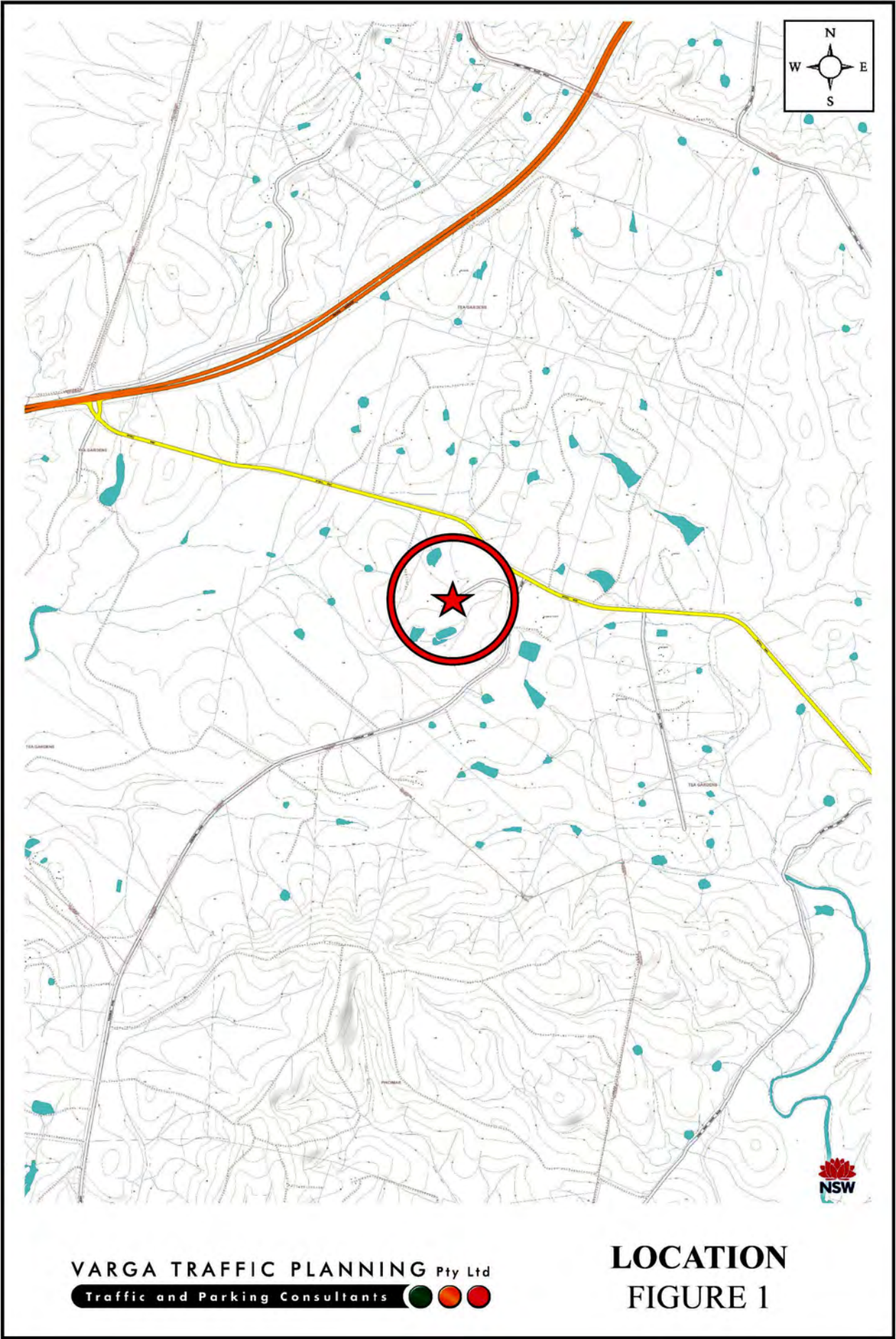
No change is proposed to the truck parking, and the associated turning area, which will continue to be provided immediately north of the approved hay shed.

No change is proposed to the vehicular access arrangements which will continue to be provided via the existing entry/exit driveways off the northern end of the Pindimar Road site frontage.

## **1.2 Purpose of this Report**

The purpose of this report is to assess the traffic and parking implications of the development proposal and to that end this report:

- describes the site and provides details of the development proposal
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network
- estimates the traffic generation potential of the development proposal, and assigns that traffic generation to the road network serving the site
- assesses the traffic implications of the development proposal in terms of road network capacity
- reviews the geometric design features of the proposed vehicular access and carparking arrangements for compliance with the relevant codes and standards
- assesses the adequacy and suitability of the quantum of off-street parking provided on the site







### 1.3 Secretary's Environmental Assessment Requirements

This report addresses the Secretary's Environmental Assessment Requirements (SEARs) for the Designated Development, SEAR 1841.

The table below details where the responses to each of the items raised under the *Traffic and Transport* section of the SEARs have been addressed in this report.

#### Secretary's Environmental Assessment Requirements

<b>Traffic and Transport</b>	<b>Report Section</b>
Details of road transport routes and access to the site	Chapter 2.3 & 3.1
Road traffic predictions for the development during construction and operation	Chapter 3.4
Swept path diagrams depicting vehicles entering, exiting, and manoeuvring throughout the site	Appendix 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	Chapter 3.5

## 2.0 PROPOSED DEVELOPMENT

### 2.1 Site

The subject site is located on the eastern corner of the Myall Way and Pindimar Road intersection. The site is irregular in shape and has a combined street frontage of approximately 1334m to Myall Way and Pindimar Road, and occupies an area of approximately 42.47 ha. The site is located approximately 5.5km northwest of the village of Tea Gardens.

The site is currently zoned *RU2 Rural Landscape* as identified in the *Great Lakes Local Environmental Plan 2014*, and is currently owned and operated by *Australian Native Landscapes*, a landscaping supply facility. Off-street parking is provided for a total of 28 cars throughout the site, with vehicular access to the site is provided via an existing entry/exit access driveway located off the northern end of the Pindimar Road site frontage.

A recent aerial image of the site and its surroundings is reproduced below.



Source: Nearmaps (Dated Fri Sep 29 2023)

## 2.2 Existing Development

The site has been operating since 1932 in one form or another, processing timber products, wood chipping, composting of wood residues and non-putrescible organics, mixing and blending of organic soils and products, landscape materials bagging, and bulk landscape materials sales and distribution.

As mentioned in the foregoing, the following development consents have been issued for the site at 12 Pindimar Road, Tea Gardens, as follows:

- **DA3264/1988** for a *“Wood Chipping Plant”*
- **DA227/2015** for a *“Landscape material supplies, packing shed and maintenance facility, managers residence, and associated works”*
- **DA-9/2021** for the *“Alterations and additions to existing operations, inclusion of wood waste processing and ancillary works”*

The wood waste processing building has approval to accept and process 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics. This generates up to approximately 45 truck movements per day.

Off-street parking is currently provided throughout the site for a total of 28 cars. Truck parking, and an associated turning area, is currently provided immediately north of the approved hay shed.

Vehicular access to the parking and loading facilities is provided via an existing entry/exit access driveway located off the northern end of the Pindimar Road site frontage.

Pindimar Road meets Myall Way at a T-intersection approximately 82m northeast of the site entrance. Myall Way then provides direct access to the Pacific Highway 2.5km to the northwest.

### 2.3 Proposed Development

The purpose of the proposed development is to assist local councils and the NSW Government to meet the target of having all household food and garden organics diverted from landfill in all LGAs by 2030.

The proposed development seeks approval to receive and compost up to 50,000tpa of FOGO within the approved wood waste processing building, which currently has approval to accept and process 150,000tpa of forestry residues, urban wood residues, and non-putrescible organics.

It is proposed to receive 50,000tpa, of FOGO, whilst reducing the amount of wood waste materials to 100,000tpa to keep the total received tonnages of organics at 150,000tpa.

Consequently, there will be no increase in the approved annual intake of organics. It is therefore expected that the existing truck movements will remain *unchanged* at approximately 45 truck movements per day.

As the wood waste building has previously been designed to accept and process wood and vegetative waste, the approved building will not require any modifications. The approved wood waste building is therefore proposed to manage leachate, noise, and odour of the proposed FOGO facility.

*No change* is proposed to the existing vehicular access, car parking, and loading arrangements as part of this application. Off-street parking is currently provided for 28 cars.

The staffing requirement is expected to remain unchanged, with the current development operating with 15 staff, and *no change* is proposed to the hours of operation, outlined below.

**Hours of Operation**

Monday to Friday	6am to 6pm
Saturday	8am to 4pm
Sunday	8am to 4pm (retail sails only)

As such, the proposed development is not expected to result in any appreciable change in traffic and parking demands currently generated by the site.

## **3.0 TRAFFIC ASSESSMENT**

### **3.1 Road Hierarchy**

The road hierarchy allocated to the road network in the vicinity of the site by Transport for New South Wales (TfNSW) is illustrated on Figure 3.

Pacific Highway is classified by TfNSW as a *State Road* and provides the key north-south road link along the central east coast of Australia, linking Brisbane to Sydney. In the vicinity of the site, it typically comprises a dual carriageway which carries two traffic lanes in each direction separated by a wide landscaped median island. Additional lanes are provided at key locations to accommodate turning movements, including at its intersection with Myall Way.

Myall Way is classified by TfNSW as a *Regional Road* and provides the key east-west road link in the area, linking Tea Gardens to the Pacific Highway. It typically carries one traffic lane in each direction in the vicinity of the site, with additional lanes provided with its intersection with Pindimar Road to accommodate turning movements.

Pindimar Road is a local, unclassified road which performs the function of a north-south *collector route*, linking Pindimar and Bundabah to Myall Way. It carries one traffic lane in each direction in the vicinity of the site.

### **3.2 Existing Traffic Controls**

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 100 km/h SPEED LIMIT which applies to Pindimar Road
- a 90 km/h SPEED LIMIT which applies to Myall Way
- a GIVE WAY restriction in Pindimar Road where it intersects with Myall Way







### 3.3 Existing Traffic Conditions

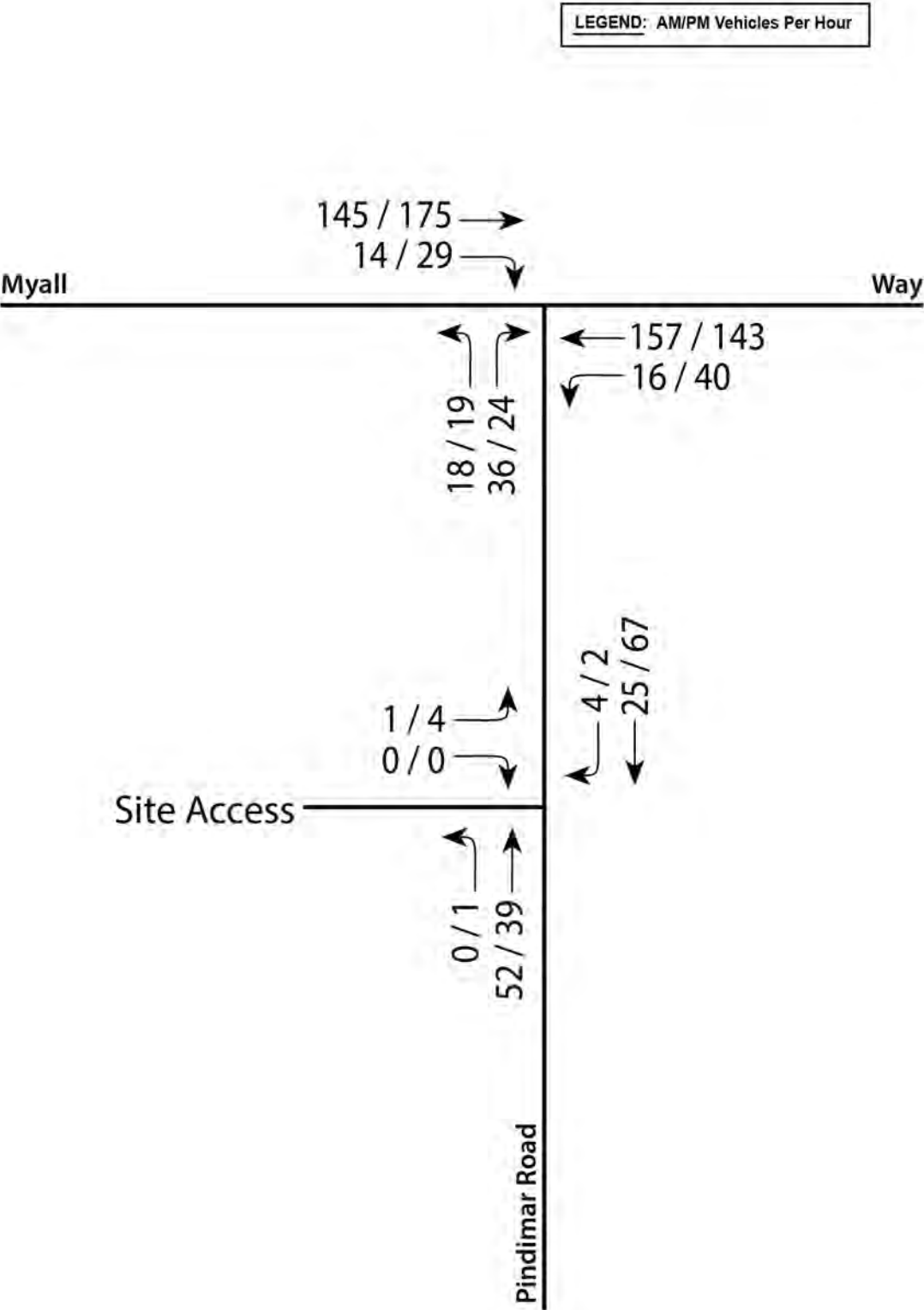
An indication of the existing traffic conditions on the road network in the vicinity of the site as well as traffic into and out of the site is provided by peak period traffic surveys undertaken as part of this traffic study.

The traffic surveys were undertaken on Wednesday 15<sup>th</sup> November 2023 between 6:30am-9:30am and 3:30pm-6:30pm at the following intersections:

- Myall Way and Pindimar Road
- Pindimar Road and the Site Access Driveway

The results of the traffic surveys are reproduced in full in Appendix A and are summarised on Figure 5, revealing that:

- eastbound traffic flows in Myall Way past the site frontage are typically in the order of 159 vph during the AM peak period, *increasing* to 205 vph during the PM peak period
- westbound traffic flows in Myall Way past the site frontage are typically in the order of 175 vph during the AM peak period, *decreasing* to 162 vph during the PM peak period
- southbound traffic flows in Pindimar Road past the site frontage are typically in the order of 25 vph during the AM peak period, *increasing* to 67 vph during the PM peak period
- northbound traffic flows in Pindimar Road past the site frontage are typically in the order of 52 vph during the AM peak period, *decreasing* to 39 vph during the PM peak period
- the site generates approximately 5 vph during the AM peak period, increasing to 7 vph during the PM peak period (IN/OUT combined)



**EXISTING PEAK HOUR TRAFFIC FLOWS**  
FIGURE 5

### 3.4 Projected Traffic Generation

The traffic implications of development proposals primarily concern the effects of the *additional* traffic flows generated as a result of a development and its impact on the operational performance of the adjacent road network.

An indication of the traffic generation potential of the development proposal is provided by reference to the Transport for NSWs' publication *Guide to Traffic Generating Developments, Section 3 – Land Use Traffic Generation (October 2002)* and the updated traffic generation rates in the TfNSW *Technical Direction TDT 2013/04a (August 2013)* document.

The *TDT 2013/04a* document specifies that it replaces those sections of the TfNSW *Guidelines* indicated and must be followed when TfNSW is undertaking trip generation and/or parking demand assessments.

The TfNSW *Guidelines* & the updated *TDT 2013/04a* document are based on extensive surveys of a wide range of land uses but does not nominate a traffic generation rate which is applicable to a resource recovery facility. Therefore, a “first principles” approach has been undertaken for the purposes of this assessment.

As noted in the foregoing, the primary purpose of the development proposal is to service the increased need and demand for resource recovery infrastructure in regional NSW.

There will be *no change* to the existing staff numbers, associated operating hours, or to the amount of organics received onsite per year, which will remain unchanged at 150,000tpa. As such, the proposed development is not expected to result in any appreciable change in traffic and parking demands currently generated by the site.

The *nett change* in the traffic generation potential of the site as a consequence of the development proposal will therefore be *statistically insignificant*, and will clearly not have any unacceptable traffic implications in terms of road network capacity, as demonstrated by the following section of this report.

### 3.5 Traffic Implications – Road Network Capacity

The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA program which is widely used by TfNSW and many LGA's for this purpose.

In this instance, there will not be any change in the traffic generation potential of the site as a consequence of the development proposal.

The detailed SIDRA *movements summaries* are reproduced in full in Appendix B, with criteria for evaluating the results of the analysis reproduced in the following pages.

The results of the SIDRA analysis of the adjacent intersection is summarised on the table below, and reveals that the Myall Way/Pindimar Road intersection operates at *Level of Service "A"* during the commuter peak period.

**SIDRA Modelling Results**

Intersection	Key Indicators	Existing Traffic Demand	
		AM	PM
Myall Way & Pindimar Road	LOS	A	A
	DS	0.073	0.089
	AVD	1.6	2.2
Pindimar Road & Site Access	LOS	A	A
	DS	0.030	0.041
	AVD	0.5	0.5

*LOS – Level of Service; DS – Degree of Saturation; AVD – Average Vehicle Delays (secs/veh)*

In summary, the SIDRA capacity analysis of the development proposal demonstrates that:

- the development proposal will not have any unacceptable traffic implications in terms of road network capacity
- no road improvements or intersection upgrades are required as a consequence of the development proposal



## Criteria for Interpreting Results of Sidra Analysis

### 1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner city conditions) and on some roads (i.e., minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

### 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

<sup>1</sup> The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

## **4.0 PARKING IMPLICATIONS**

### **4.1 Existing Kerbside Parking Restrictions**

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 6 and comprise:

- NO STOPPING restrictions along both sides of Myall Way and Pindimar Road
- a BUS ZONE on Myall Way, adjacent to its intersection with Pindimar Road

### **4.2 Off-Street Parking Provisions**

*As State Environmental Planning Policy (Transport and Infrastructure) 2021 is the planning instrument allowing permissibility of the proposed activity, provisions of Council's Great Lakes Development Control Plan 2013 do not apply.*

In any event, as noted in the foregoing, the primary purpose of the development proposal is to service the increased need and demand for resource recovery infrastructure in regional NSW.

There will be *no change* to the existing staff numbers, associated operating hours, and to the amount of organics received onsite per year. As such, the proposed development is not expected to result in any appreciable change in the approved traffic and parking demands generated by the site.

### **4.3 Loading/Servicing Provisions**

The proposed development is again expected to be serviced by a variety of commercial vehicles, up to and including 19m long AV trucks.

The manoeuvring and vehicular access driveways have been designed to accommodate the swept turning path requirements of these trucks, allowing them to enter and exit the site in a forward direction at all times, as indicated by the *swept turning path* diagrams reproduced in Appendix C.



## 5.0 CONCLUSION

Based on the analysis and discussions presented within this report, the following conclusions are made:

- the proposed development seeks to receive and compost up to 50,000tpa of FOGO within the existing approved wood waste processing building while reducing the amount of wood waste materials to 100,000tpa to keep the total received tonnages of organics at 150,000tpa. Consequently, there will be no increase in the annual intake of organics
- the purpose of the development is to service the increased need and demand for resource recovery infrastructure in regional NSW. This infrastructure would assist local councils and the NSW Government to meet the target of having all household food and garden organics diverted from landfill in all LGAs by 2030
- there will be *no change* to the existing staff numbers, associated operating hours, and to the number of organics received onsite per year. As such, the proposed development is not expected to result in any appreciable change in the approved traffic and parking demands generated by the site
- the SIDRA capacity analysis of the nearby intersections located around the perimeter of the site indicate that:
  - all intersections operate at *Levels of Service “A”*, and
  - no road improvements or intersection upgrades would be required as a consequence of the development proposal
- the proposed manoeuvring areas will satisfactorily allow 19m long AV trucks to enter and exit the site in a forward direction at all times, as demonstrated by the attached *swept turning path* diagrams

It is therefore reasonable to conclude that the proposed development will not have any unacceptable implications in terms of road network capacity, vehicular access or off-street parking/loading requirements.

## **APPENDIX A**

### **TRAFFIC SURVEY DATA**

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Myall Way and Pindimar Rd, Tea Gardens

GPS -32.619423, 152.114039

Date:	Wed 15/11/23
Weather:	Overcast
Suburban:	Tea Gardens
Customer:	Varga

North:	N/A
East:	Myall Way
South:	Pindimar Rd
West:	Myall Way

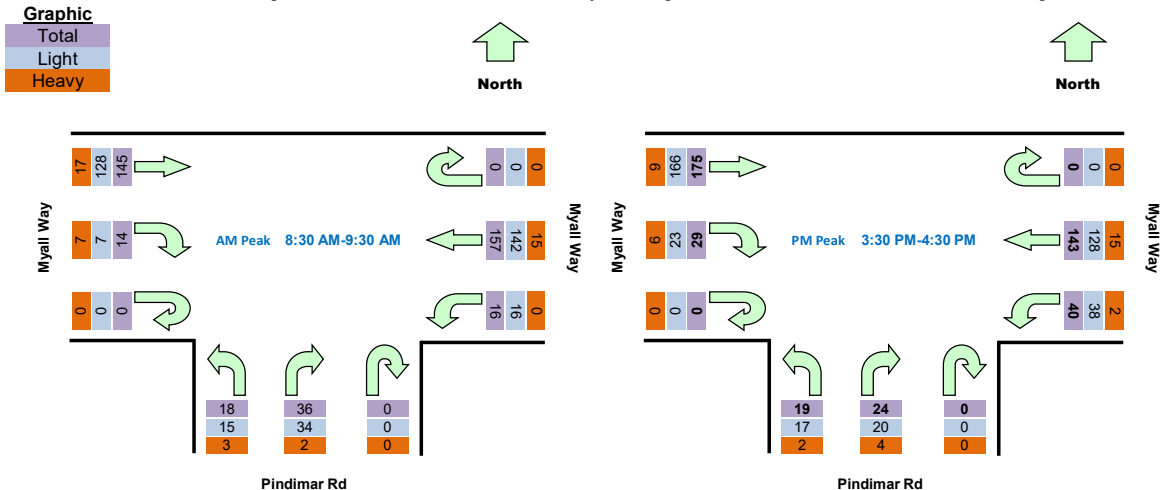
Survey Period	AM: 6:30 AM-9:30 AM
PM: 3:30 PM-6:30 PM	
Traffic Peak	AM: 8:30 AM-9:30 AM
PM: 3:30 PM-4:30 PM	

#### All Vehicles

Time		East Approach Myall Way			South Approach Pindimar Rd			West Approach Myall Way			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
6:30	6:45	0	22	0	0	3	1	0	0	30	273	
6:45	7:00	0	21	3	0	6	4	0	4	29	301	
7:00	7:15	0	38	2	0	6	4	0	1	27	333	
7:15	7:30	0	30	2	0	7	8	0	2	23	353	
7:30	7:45	0	23	4	0	12	9	0	5	31	366	
7:45	8:00	0	34	0	0	10	7	0	5	43	374	
8:00	8:15	0	48	6	0	5	5	0	3	31	378	
8:15	8:30	0	26	3	0	12	5	0	3	36	374	
8:30	8:45	0	35	7	0	7	1	0	3	39	386	Peak
8:45	9:00	0	41	3	0	11	7	0	2	39		
9:00	9:15	0	36	4	0	7	6	0	5	36		
9:15	9:30	0	45	2	0	11	4	0	4	31		
15:30	15:45	0	46	16	0	6	6	0	9	67	430	Peak
15:45	16:00	0	30	13	0	6	4	0	7	35	373	
16:00	16:15	0	30	6	0	7	8	0	9	41	381	
16:15	16:30	0	37	5	0	5	1	0	4	32	371	
16:30	16:45	0	27	6	0	3	6	0	3	48	359	
16:45	17:00	0	36	7	0	4	5	0	4	47	324	
17:00	17:15	0	24	6	0	5	5	0	5	46	282	
17:15	17:30	0	26	1	0	2	2	0	3	38	250	
17:30	17:45	0	17	3	0	4	2	0	6	26	224	
17:45	18:00	0	21	5	0	1	2	0	7	25		
18:00	18:15	0	14	6	0	6	1	0	3	29		
18:15	18:30	0	13	1	0	2	3	0	1	26		

Peak Time		East Approach Myall Way			South Approach Pindimar Rd			West Approach Myall Way			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
8:30	9:30	0	157	16	0	36	18	0	14	145	386
15:30	16:30	0	143	40	0	24	19	0	29	175	430

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.





**Light Vehicles**

Time		East Approach Myall Way			South Approach Pindimar R			West Approach Myall Way		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
6:30	6:45	0	22	0	0	3	1	0	0	25
6:45	7:00	0	20	3	0	6	4	0	1	26
7:00	7:15	0	33	2	0	6	3	0	0	22
7:15	7:30	0	29	1	0	5	7	0	1	17
7:30	7:45	0	23	2	0	10	5	0	3	28
7:45	8:00	0	28	0	0	10	6	0	3	42
8:00	8:15	0	46	5	0	5	3	0	1	30
8:15	8:30	0	25	2	0	11	2	0	3	31
8:30	8:45	0	32	7	0	6	1	0	2	36
8:45	9:00	0	36	3	0	11	4	0	1	33
9:00	9:15	0	33	4	0	6	6	0	2	31
9:15	9:30	0	41	2	0	11	4	0	2	28
15:30	15:45	0	40	15	0	6	6	0	9	60
15:45	16:00	0	26	13	0	4	4	0	5	33
16:00	16:15	0	27	5	0	5	7	0	6	41
16:15	16:30	0	35	5	0	5	0	0	3	32
16:30	16:45	0	25	6	0	3	6	0	3	45
16:45	17:00	0	31	7	0	4	4	0	4	44
17:00	17:15	0	23	6	0	5	5	0	5	44
17:15	17:30	0	26	1	0	2	1	0	3	37
17:30	17:45	0	16	2	0	3	2	0	6	26
17:45	18:00	0	21	5	0	1	2	0	7	25
18:00	18:15	0	13	6	0	6	1	0	3	29
18:15	18:30	0	13	1	0	2	3	0	1	25

Peak Time		East Approach Myall Way			South Approach Pindimar R			West Approach Myall Way			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
8:30	9:30	0	142	16	0	34	15	0	7	128	342
15:30	16:30	0	128	38	0	20	17	0	23	166	392

**Heavy Vehicles**

Time		East Approach Myall Way			South Approach Pindimar R			West Approach Myall Way		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
6:30	6:45	0	0	0	0	0	0	0	0	5
6:45	7:00	0	1	0	0	0	0	0	3	3
7:00	7:15	0	5	0	0	0	1	0	1	5
7:15	7:30	0	1	1	0	2	1	0	1	6
7:30	7:45	0	0	2	0	2	4	0	2	3
7:45	8:00	0	6	0	0	0	1	0	2	1
8:00	8:15	0	2	1	0	0	2	0	2	1
8:15	8:30	0	1	1	0	1	3	0	0	5
8:30	8:45	0	3	0	0	1	0	0	1	3
8:45	9:00	0	5	0	0	0	3	0	1	6
9:00	9:15	0	3	0	0	1	0	0	3	5
9:15	9:30	0	4	0	0	0	0	0	2	3
15:30	15:45	0	6	1	0	0	0	0	0	7
15:45	16:00	0	4	0	0	2	0	0	2	2
16:00	16:15	0	3	1	0	2	1	0	3	0
16:15	16:30	0	2	0	0	0	1	0	1	0
16:30	16:45	0	2	0	0	0	0	0	0	3
16:45	17:00	0	5	0	0	0	1	0	0	3
17:00	17:15	0	1	0	0	0	0	0	0	2
17:15	17:30	0	0	0	0	0	1	0	0	1
17:30	17:45	0	1	1	0	1	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0
18:00	18:15	0	1	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	1

Peak Time		East Approach Myall Way			South Approach Pindimar R			West Approach Myall Way			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
8:30	9:30	0	15	0	0	2	3	0	7	17	44
15:30	16:30	0	15	2	0	4	2	0	6	9	38

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of No.12 Access Driveway and Pindimar R

GPS -32.620105, 152.113639

Date:	Wed 15/11/23
Weather:	Overcast
Suburban:	Tea Gardens
Customer:	Varga

North:	Pindimar Rd
East:	N/A
South:	Pindimar Rd
West:	No.12 Access Driveway

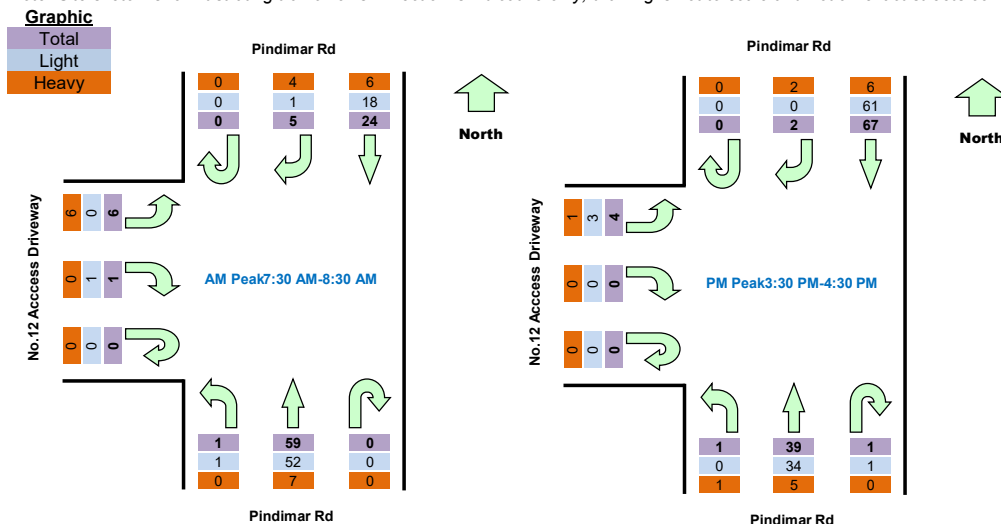
Survey Period	AM: 6:30 AM-9:30 AM
	PM: 3:30 PM-6:30 PM
Traffic Peak	AM: 7:30 AM-8:30 AM
	PM: 3:30 PM-4:30 PM

#### All Vehicles

Time		North Approach Pindimar Rd			South Approach Pindimar Rd			Approach No.12 Access Dr			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
6:30	6:45	0	0	0	0	4	0	0	0	0	54	
6:45	7:00	0	2	5	0	10	0	0	0	0	80	
7:00	7:15	0	1	2	0	9	1	0	0	1	86	
7:15	7:30	0	2	2	0	14	0	0	0	1	92	
7:30	7:45	0	1	8	0	18	0	0	0	3	96	Peak
7:45	8:00	0	1	4	0	17	1	0	0	0	84	
8:00	8:15	0	3	6	0	9	0	0	1	1	83	
8:15	8:30	0	0	6	0	15	0	0	0	2	85	
8:30	8:45	0	0	10	0	8	0	0	0	0	83	
8:45	9:00	1	0	4	0	16	0	0	0	1		
9:00	9:15	0	2	7	0	13	0	0	0	0		
9:15	9:30	0	2	4	0	15	0	0	0	0		
15:30	15:45	0	1	24	1	10	1	0	0	2	114	Peak
15:45	16:00	0	0	20	0	9	0	0	0	1	93	
16:00	16:15	0	1	14	0	14	0	0	0	1	83	
16:15	16:30	0	0	9	0	6	0	0	0	0	74	
16:30	16:45	0	0	9	0	8	0	0	0	1	67	
16:45	17:00	0	0	11	0	8	0	0	0	1	64	
17:00	17:15	0	0	11	0	6	0	0	0	4	59	
17:15	17:30	0	0	4	0	4	0	0	0	0	54	
17:30	17:45	0	1	8	0	5	0	0	0	1	53	
17:45	18:00	0	0	12	0	2	0	0	0	1		
18:00	18:15	0	0	9	0	7	0	0	0	0		
18:15	18:30	0	0	2	0	5	0	0	0	0		

Peak Time		North Approach Pindimar Rd			South Approach Pindimar Rd			Approach No.12 Access Dr			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:30	8:30	0	5	24	0	59	1	0	1	6	96
15:30	16:30	0	2	67	1	39	1	0	0	4	114

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



**Light Vehicles**

Time		North Approach Pindimar R			South Approach Pindimar R			Approach No.12 Access Dr		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:30	6:45	0	0	0	0	4	0	0	0	0
6:45	7:00	0	1	3	0	10	0	0	0	0
7:00	7:15	0	0	2	0	9	1	0	0	0
7:15	7:30	0	0	2	0	12	0	0	0	0
7:30	7:45	0	0	5	0	15	0	0	0	0
7:45	8:00	0	0	3	0	16	1	0	0	0
8:00	8:15	0	1	5	0	8	0	0	1	0
8:15	8:30	0	0	5	0	13	0	0	0	0
8:30	8:45	0	0	9	0	7	0	0	0	0
8:45	9:00	0	0	4	0	15	0	0	0	0
9:00	9:15	0	0	6	0	12	0	0	0	0
9:15	9:30	0	0	4	0	15	0	0	0	0
15:30	15:45	0	0	24	1	10	0	0	0	2
15:45	16:00	0	0	18	0	7	0	0	0	1
16:00	16:15	0	0	11	0	12	0	0	0	0
16:15	16:30	0	0	8	0	5	0	0	0	0
16:30	16:45	0	0	9	0	8	0	0	0	1
16:45	17:00	0	0	11	0	7	0	0	0	1
17:00	17:15	0	0	11	0	6	0	0	0	4
17:15	17:30	0	0	4	0	3	0	0	0	0
17:30	17:45	0	1	7	0	5	0	0	0	0
17:45	18:00	0	0	12	0	2	0	0	0	1
18:00	18:15	0	0	9	0	7	0	0	0	0
18:15	18:30	0	0	2	0	5	0	0	0	0

Peak Time		North Approach Pindimar R			South Approach Pindimar R			Approach No.12 Access Dr			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:30	8:30	0	1	18	0	52	1	0	1	0	73
15:30	16:30	0	0	61	1	34	0	0	0	3	99

**Heavy Vehicles**

Time		North Approach Pindimar R			South Approach Pindimar R			Approach No.12 Access Dr		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:30	6:45	0	0	0	0	0	0	0	0	0
6:45	7:00	0	1	2	0	0	0	0	0	0
7:00	7:15	0	1	0	0	0	0	0	0	1
7:15	7:30	0	2	0	0	2	0	0	0	1
7:30	7:45	0	1	3	0	3	0	0	0	3
7:45	8:00	0	1	1	0	1	0	0	0	0
8:00	8:15	0	2	1	0	1	0	0	0	1
8:15	8:30	0	0	1	0	2	0	0	0	2
8:30	8:45	0	0	1	0	1	0	0	0	0
8:45	9:00	1	0	0	0	1	0	0	0	1
9:00	9:15	0	2	1	0	1	0	0	0	0
9:15	9:30	0	2	0	0	0	0	0	0	0
15:30	15:45	0	1	0	0	0	1	0	0	0
15:45	16:00	0	0	2	0	2	0	0	0	0
16:00	16:15	0	1	3	0	2	0	0	0	1
16:15	16:30	0	0	1	0	1	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	1	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	1	0	0	0	0
17:30	17:45	0	0	1	0	0	0	0	0	1
17:45	18:00	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Pindimar R			South Approach Pindimar R			Approach No.12 Access Dr			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:30	8:30	0	4	6	0	7	0	0	0	6	23
15:30	16:30	0	2	6	0	5	1	0	0	1	15

## **APPENDIX B**

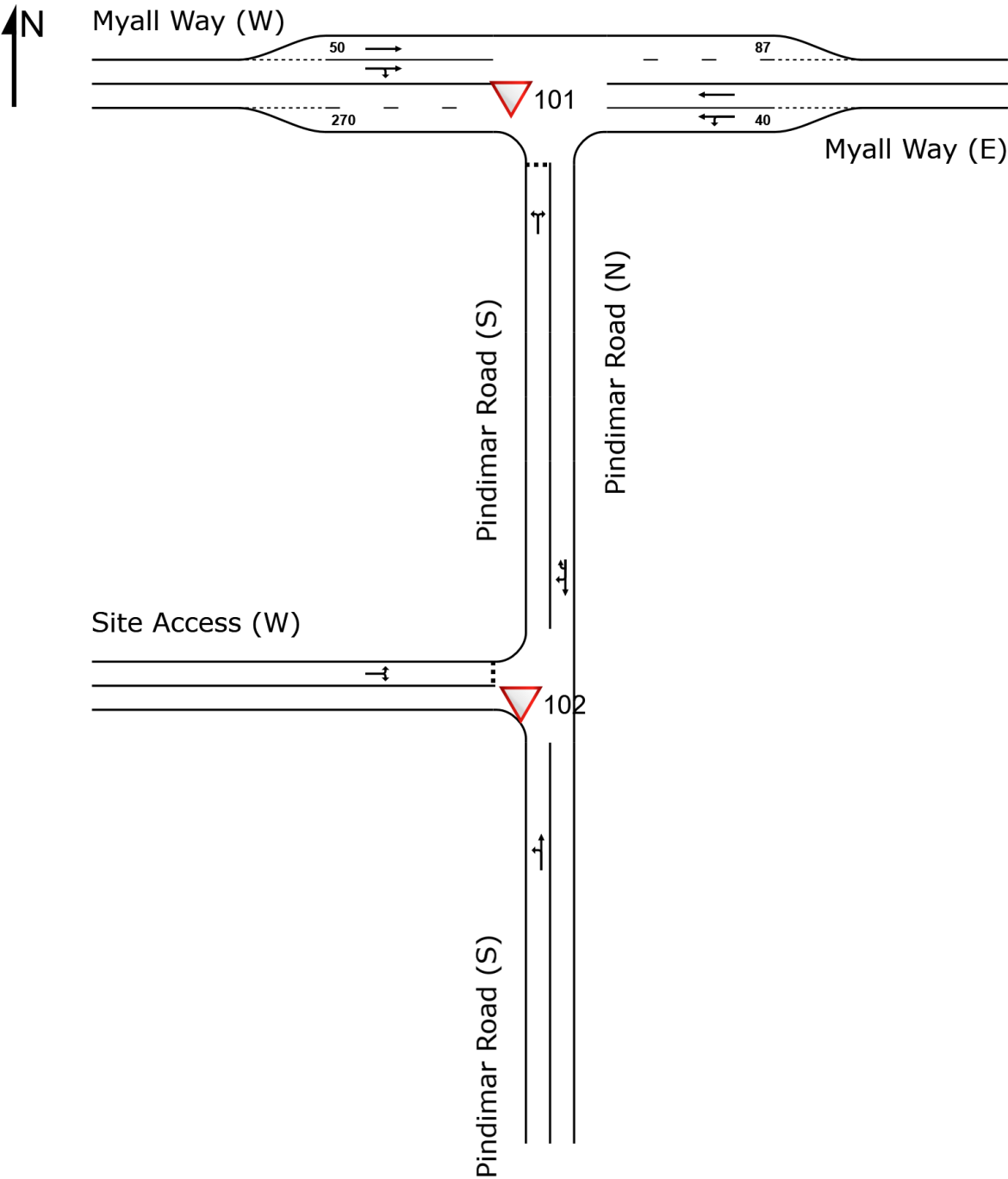
### **SIDRA MOVEMENT SUMMARIES**

# NETWORK LAYOUT

■ Network: N101 [Existing AM (Network Folder: General)]

New Network  
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	CCG ID	Site Name
▽101	NA	Myall Way and Pindimar Road Existing AM
▽102	NA	Pindimar Road and Site Access Existing AM

# MOVEMENT SUMMARY

▼ Site: 101 [Myall Way and Pindimar Road Existing AM (Site Folder: General)]

■ Network: N101 [Existing AM (Network Folder: General)]

Myall Way and Pindimar Road Intersection  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Pindimar Road (S)														
1	L2	19	16.7	19	16.7	0.073	4.7	LOS A	0.1	0.8	0.28	0.62	0.28	55.6
3	R2	38	5.6	38	5.6	0.073	6.8	LOS A	0.1	0.8	0.28	0.62	0.28	60.2
Approach		57	9.3	57	9.3	0.073	6.1	LOS A	0.1	0.8	0.28	0.62	0.28	58.6
East: Myall Way (E)														
4	L2	17	0.0	17	0.0	0.050	7.4	LOS A	0.0	0.0	0.00	0.12	0.00	83.9
5	T1	165	9.6	165	9.6	0.050	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	88.5
Approach		182	8.7	182	8.7	0.050	0.8	NA	0.0	0.0	0.00	0.06	0.00	88.3
West: Myall Way (W)														
11	T1	153	11.7	153	11.7	0.070	0.3	LOS A	0.1	0.5	0.07	0.05	0.07	88.4
12	R2	15	50.0	15	50.0	0.070	9.6	LOS A	0.1	0.5	0.12	0.09	0.12	85.1
Approach		167	15.1	167	15.1	0.070	1.1	NA	0.1	0.5	0.08	0.06	0.08	88.3
All Vehicles		406	11.4	406	11.4	0.073	1.6	NA	0.1	0.8	0.07	0.14	0.07	84.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

Site: 102 [Pindimar Road and Site Access Existing AM (Site Folder: General)]

Network: N101 [Existing AM (Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Pindimar Road (S)														
1	L2	1	0.0	1	0.0	0.030	7.4	LOS A	0.0	0.0	0.00	0.01	0.00	82.1
2	T1	55	5.8	55	5.8	0.030	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	89.3
Approach		56	5.7	56	5.7	0.030	0.1	NA	0.0	0.0	0.00	0.01	0.00	89.0
North: Pindimar Road (N)														
8	T1	26	8.0	26	8.0	0.021	0.1	LOS A	0.0	0.2	0.08	0.10	0.08	86.6
9	R2	4	100.0	4	100.0	0.021	4.2	LOS A	0.0	0.2	0.08	0.10	0.08	49.2
9u	U	1	100.0	1	100.0	0.021	5.8	LOS A	0.0	0.2	0.08	0.10	0.08	70.0
Approach		32	23.3	32	23.3	0.021	0.9	NA	0.0	0.2	0.08	0.10	0.08	78.3
West: Site Access (W)														
10	L2	1	100.0	1	100.0	0.002	7.0	LOS A	0.0	0.0	0.16	0.54	0.16	49.2
12	R2	1	0.0	1	0.0	0.002	5.7	LOS A	0.0	0.0	0.16	0.54	0.16	59.1
Approach		2	50.0	2	50.0	0.002	6.4	LOS A	0.0	0.0	0.16	0.54	0.16	55.4
All Vehicles		89	12.9	89	12.9	0.030	0.5	NA	0.0	0.2	0.03	0.06	0.03	83.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
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 [Myall Way and Pindimar Road Existing PM (Site Folder: General)]

Network: N101 [Existing PM (Network Folder: General)]

Myall Way and Pindimar Road Intersection  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Pindimar Road (S)														
1	L2	20	10.5	20	10.5	0.060	4.5	LOS A	0.1	0.7	0.21	0.59	0.21	58.0
3	R2	25	16.7	25	16.7	0.060	7.7	LOS A	0.1	0.7	0.21	0.59	0.21	55.0
Approach		45	14.0	45	14.0	0.060	6.3	LOS A	0.1	0.7	0.21	0.59	0.21	56.3
East: Myall Way (E)														
4	L2	42	5.0	42	5.0	0.053	7.5	LOS A	0.0	0.0	0.00	0.29	0.00	77.3
5	T1	151	10.5	151	10.5	0.053	0.1	LOS A	0.0	0.0	0.00	0.10	0.00	87.4
Approach		193	9.3	193	9.3	0.053	1.7	NA	0.0	0.0	0.00	0.15	0.00	86.0
West: Myall Way (W)														
11	T1	181	3.5	181	3.5	0.089	0.4	LOS A	0.1	1.0	0.11	0.09	0.11	87.1
12	R2	34	28.1	34	28.1	0.089	9.0	LOS A	0.1	1.0	0.19	0.16	0.19	80.7
Approach		215	7.4	215	7.4	0.089	1.7	NA	0.1	1.0	0.12	0.10	0.12	86.5
All Vehicles		453	8.8	453	8.8	0.089	2.2	NA	0.1	1.0	0.08	0.17	0.08	83.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

▼ Site: 102 [Pindimar Road and Site Access Existing PM (Site Folder: General)]

■ Network: N101 [Existing PM (Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist m				
South: Pindimar Road (S)														
1	L2	1	100.0	1	100.0	0.025	9.8	LOS A	0.0	0.0	0.01	0.03	0.01	62.3
2	T1	41	12.8	41	12.8	0.025	0.0	LOS A	0.0	0.0	0.01	0.03	0.01	86.6
3u	U	1	0.0	1	0.0	0.025	7.1	LOS A	0.0	0.0	0.01	0.03	0.01	68.0
Approach		43	14.6	43	14.6	0.025	0.4	NA	0.0	0.0	0.01	0.03	0.01	84.0
North: Pindimar Road (N)														
8	T1	71	9.0	71	9.0	0.041	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	89.4
9	R2	2	100.0	2	100.0	0.041	4.2	LOS A	0.0	0.1	0.01	0.02	0.01	50.1
Approach		73	11.6	73	11.6	0.041	0.1	NA	0.0	0.1	0.01	0.02	0.01	87.4
West: Site Access (W)														
10	L2	4	25.0	4	25.0	0.004	6.0	LOS A	0.0	0.0	0.12	0.54	0.12	50.3
12	R2	1	0.0	1	0.0	0.004	5.8	LOS A	0.0	0.0	0.12	0.54	0.12	59.9
Approach		5	20.0	5	20.0	0.004	5.9	LOS A	0.0	0.0	0.12	0.54	0.12	53.1
All Vehicles		121	13.0	121	13.0	0.041	0.5	NA	0.0	0.1	0.02	0.05	0.02	83.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## **APPENDIX C**

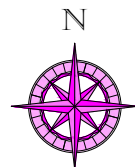
### **SWEPT TURNING PATH DIAGRAMS**





VARGA TRAFFIC PLANNING Pty Ltd Phone +61 2 9904 3224  
ABN 88 071 762 537 PO Box 1868  
Suite 6, Level 1 Neutral Bay, NSW 2089  
20 Young Street www.vargatrafic.com.au  
Neutral Bay, NSW 2089 Sydney, Australia

PROJECT  
FOGO Facility



DRAWING TITLE  
19M LONG AV TRUCK TURNING PATH  
Entering/Exiting Site

ADDRESS  
12 Pindimar Road,  
Tea Gardens

1:500 @ A3

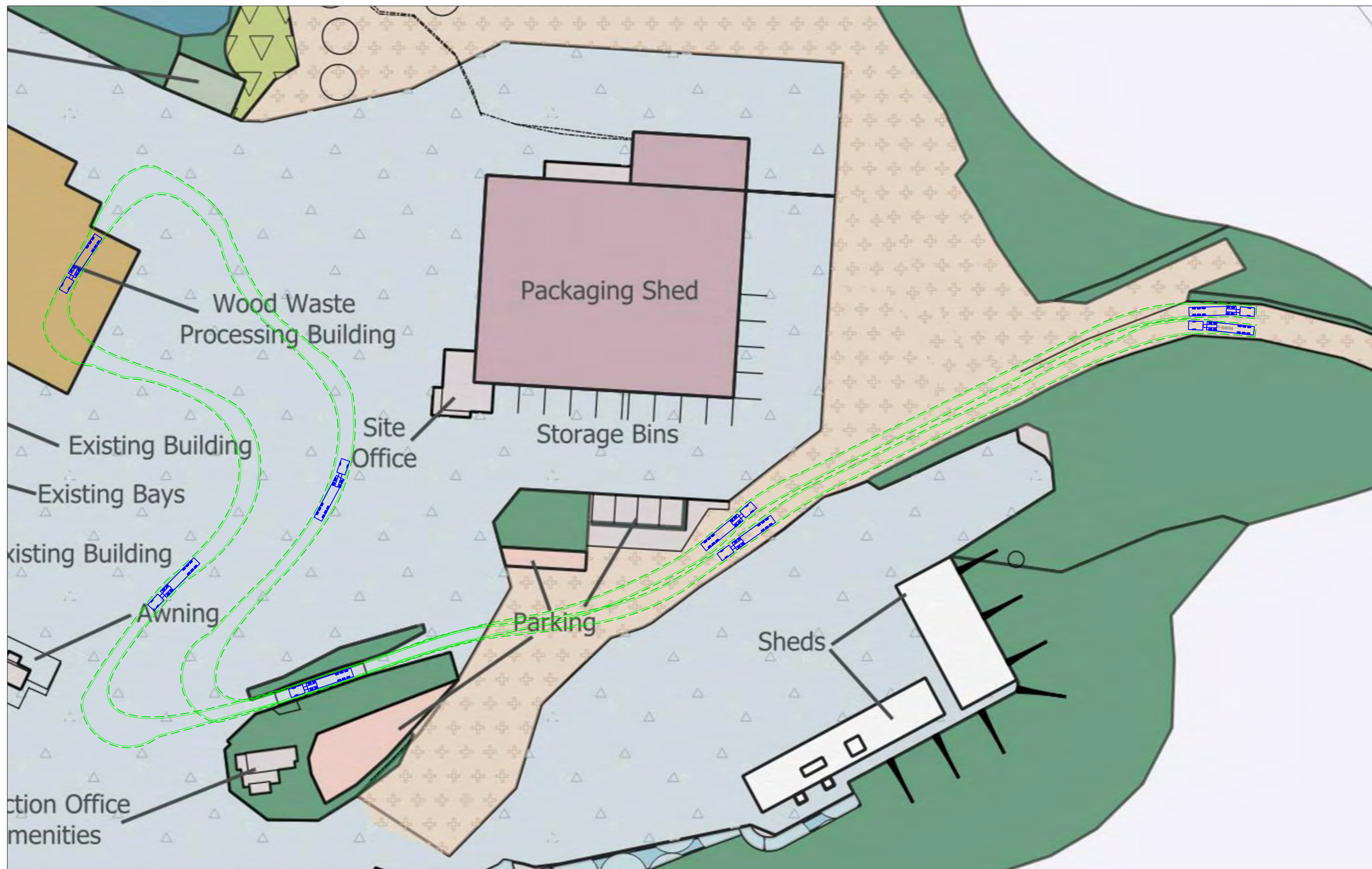
PROJECT NO.  
23465  
REVIEWED  
ROBERT VARGA

DATE DRAWN  
2024-5-29  
PREPARED  
ZACHARY CAI

**VARGA TRAFFIC PLANNING** Pty Ltd  
**Transport, Traffic and Parking Consultants**



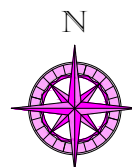




VARGA TRAFFIC PLANNING Pty Ltd  
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 Neutral Bay, NSW 2089  
 www.vargatrafic.com.au  
 Sydney, Australia

PROJECT  
 FOGO Facility



DRAWING TITLE  
**19M LONG AV TRUCK TURNING PATH**  
 Manoeuvring throughout the Site  
 ADDRESS  
 12 Pindimar Road,  
 Tea Gardens

PROJECT NO.  
 23465  
 REVIEWED  
 ROBERT VARGA

1:1000 @ A3

DATE DRAWN  
 2024-5-29  
 PREPARED  
 ZACHARY CAI

**VARGA TRAFFIC PLANNING** Pty Ltd

**Transport, Traffic and Parking Consultants**







## APPENDIX H – NOISE AND VIBRATION ASSESSMENT

Commercial 1 (Unit 27)

+612 9587 9702

*DELIVERING SOUND ADVICE*

637-645 Forest Road

office@koikasacoustics.com

Bexley NSW 2207

www.koikasacoustics.com

ABN: 12 058 524 771

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## ACOUSTICAL REPORT

### PROPOSAL TO RECEIVE AND PROCESS



### FOOD ORGANICS AND GREEN ORGANICS [FOGO] AT

### 12 PINDIMAR ROAD, TEA GARDENS NSW

**Date:** 19 August 2024

**File Reference:** 5073R20240301as12PindimarRdTeaGardens\_DA2

## DOCUMENT CONTROL

<b>Project title</b>	Acoustical Report Proposal to receive and process food organics and green organics [FOGO] at 12 Pindimar Road, Tea Gardens NSW		
<b>Project number</b>	5072		
<b>Document reference</b>	5073R20240301as12PindimarRdTeaGardens_DA2		
<b>Document path</b>	G:\Shared drives\KA Acoustics 2024\REPORT\Industrial\5073 (as) 12 Pindimar Rd, Tea Gardens\5073R20240301as12PindimarRdTeaGardens_DA2.docx		
<b>Date</b>	<b>Author</b>	<b>Review</b>	<b>Notes</b>
19/08/2024	AS	NK	Report available for issue
<b>Approved by</b>	Adam Semple Senior Acoustical Consultant 		
	Member of the Australian Acoustical Society - MAAS 		
<b>Client</b>	Australian Native Landscapes Pty Ltd Attention: Patrick Soars ( <a href="mailto:patrick@anlscape.com.au">patrick@anlscape.com.au</a> ) C/- Wedgetail Project Consulting Attention: Shaun Smith ( <a href="mailto:ssmith@wedgetail.com.au">ssmith@wedgetail.com.au</a> )		

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**ACOUSTICAL REPORT**  
**PROPOSAL TO RECEIVE AND PROCESS**  
**FOOD ORGANICS AND GREEN ORGANICS [FOGO] AT**  
**12 PINDIMAR ROAD, TEA GARDENS NSW**

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**TABLE OF APPENDICES**

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Appendix A: Logger graphs

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Appendix B: CadnaA model layouts – Operational noise

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## 1.0 INTRODUCTION

Koikas Acoustics Pty Ltd has been engaged by Australian Native Landscapes Pty Ltd to conduct a noise impact assessment of a proposal to allow receipt and processing of up to 50,000 TPA (tonnes per annum) of food organics and garden organics (FOGO) material at the existing waste wood processing and landscape material supplies facility at 12 Pindimar Road, Tea Gardens.

As directed by the Secretary's Environmental Assessment Requirements (SEARs), noise emissions from the proposed use are assessed in this report under the NSW Environmental Protection Authority Noise Policy for Industry (NPfI).

We note that the application does not propose any construction works nor will it result in any additional traffic movements (light or heavy vehicles) to or from the site beyond that currently approved, meaning an assessment of construction noise and on-road traffic noise is not warranted.

The following sections of this report provide a brief outline of the development, establish the project noise objectives from the referenced noise policies, predict noise levels to surrounding receptors, and recommend noise mitigation measures necessary to meet the project noise objectives.



## 2.0 THE PROPOSAL

**The existing operation** at 12 Pindimar Road, Tea Gardens is a waste wood processing and landscape material supplies facility that operates under existing council approval and EPL 3877.

**DA-9/2021** was approved by the Mid Coast Council on 27 April 2022 which formalised approval for alterations and additions to the site operations and the inclusion of a new wood waste processing building along with other ancillary works. The site retained approval to receive up to 150,000 TPA of wood waste materials.

Condition 40 of the consent establishes the hours of operation for the site as:

- 6.00 am to 6.00 pm Monday to Friday.
- 8.00 am to 1.00 pm Saturday.
- No work is approved on Sundays or public holidays.

We understand the new buildings approved under DA-9/2021 are not yet constructed.

An acoustic report prepared by this office (Ref: 5073R20211209as12PindimarRdTeaGardens\_DA(2), dated 22 December 2021) was submitted in support of that application. That report also formed part of the supporting information reviewed by the NSW EPA as part of their General Terms of Approval to vary the Environmental Protection Licence for the site.

**The current application** is solely related to permitting the site to receive and process 50,000 TPA of FOGO material within the approved wood waste building (yet to be constructed). Wood waste materials to be received and processed will be reduced to 100,000 TPA to keep the total received tonnage for the site in compliance with the 150,000 TPA limit. No building works are required.

The wood waste building approved under DA-9/2021 is designed to receive and process wood and vegetative waste materials and will require no changes to accommodate the FOGO materials. The application simply relates to adding the FOGO materials as an additional feedstock.

No operational aspects of the existing approved site such as hours of operation and truck movements to/from/within the site are required to change under the current application.





The composting process as described within the scoping report can be summarised as:

- FOGO waste materials are received within the wood waste building and unloaded within the fully enclosed building.
- The material is shredded using the slow-speed shredder and then placed onto a proprietary Aero-Sorb<sup>(1)</sup> aerated floor system platform where the initial stage of composting takes place over a 14 to 28-day period.
- During this initial stage, the material is turned three times to achieve pasteurisation.
- It is then removed from the building via a conveyor system and placed externally on a maturation bed for further composting over a 6 to 8-week period.
- The final composted material is then blended for sale.

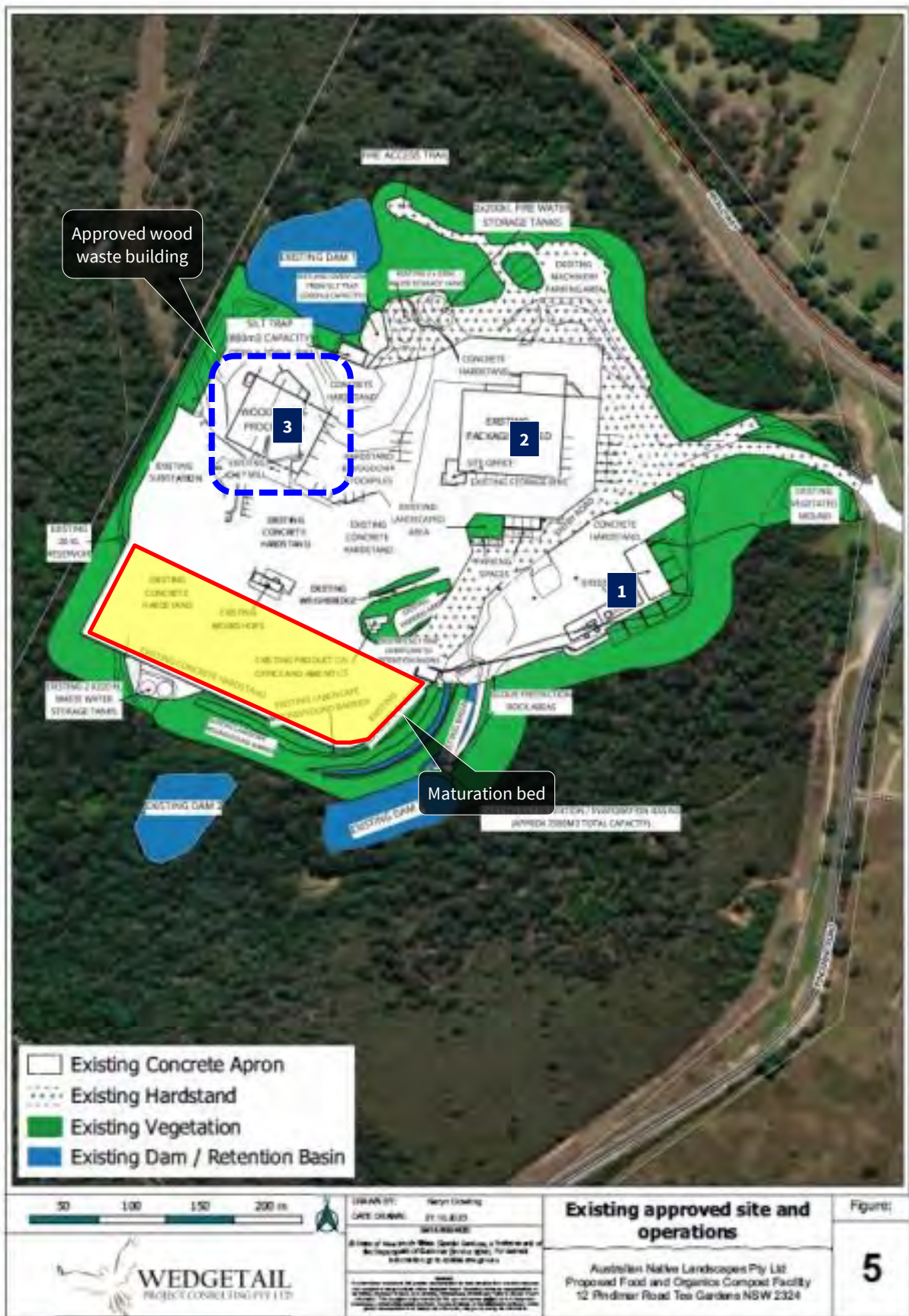
**Figure 1** is an excerpt from the Wedgetail scoping report that indicates the approved site and operations. The location of the wood waste processing building is identified, and this is where the FOGO materials are received and where the first stage of the processing/composting process is undertaken. The final stage of the maturation/composting process occurs externally within a maturation bed and this location is also identified in **Figure 1**.

**Figure 2** is a broader aerial photograph showing the site extent relative to the nearest residential neighbours and the locations where environmental noise monitoring was conducted by Koikas Acoustics.

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(1) The Aero-Sorb technology is described as an aerated floor slab with a series of underfloor aeration pipes fed by two aeration fans. The FOGO material is placed on the aeration slab where it is ventilated with the resulting air distributed into the main air space of the building. An external biofilter is then used to ensure no fugitive odours are released from the building.





**Figure 1.** Indicative layout of proposed development areas





**Figure 2.** Site context

### 3.0 EXISTING APPROVED USES

The scoping report by Wedgetail notes that the primary functions of the site are:

- Processing of timber products,
- Wood chipping,
- Composting of wood residues and non-putrescible organics,
- Mixing and blending of organic soils and products,
- Landscape material bagging, and
- Bulk landscape material sales and distribution.

To facilitate the above, there are several existing and approved but yet constructed buildings on the site. We also note that existing approvals have formalised the use of several items of plant and equipment/heavy machinery to complete the approved works.

Key features of the primary buildings and their respective uses are described as follows:

#### Hay baling and storage sheds

- The hay baling and storage sheds are marked '1' in **Figure 1**.
- The storage shed is approximately 18 m x 45 m x 7 m with the northern side of the building fully open.
- A large opening also exists in the eastern façade.
- The storage shed is a relatively low-noise area where hay bales are stored.
- The use of a forklift is the only noise-generating source.
- The baling shed is approximately 12 m x 60 m x 7 m with the northern side of the building fully open.
- This building houses an in-feed conveyor and baler along with the out-feed conveyor and baler.
- Noise levels used within this report are from measurements conducted and reported on by Ray Walsh Acoustics for the ANL facility in Holbrook.
- The baling shed at the Holbrook site was predominantly an enclosed building whereas the Tea Gardens proposal is for the entire northern façade of the shed to be open.



### **Packaging building and workshop**

- The packaging and distribution shed and workshop are marked '2' in **Figure 1**.
- The building is approximately 33 m x 15 m.
- Works taking place within this area are typical engineering works thus the internal noise levels will be commensurate with typical workshop noise levels.
- Workshop noise levels used in the assessment have been sourced from measurements conducted elsewhere by Koikas Acoustics.

### **Wood waste processing building**

- The wood waste processing building is marked '3' in **Figure 1**.
- The building is approximately 69 m x 45 m x 12 m.
- The building is used to process wood waste and will be used to process FOGO material.
- Processing and sorting equipment is located internally such as a shredder and screener.
- Trucks are loaded and unloaded internally and with all doors closed.
- Sound power levels for equipment and work processes are derived from noise measurements conducted by Koikas Acoustics at the Tea Gardens site.



## 4.0 NOISE SENSITIVE RECEIVERS

As indicated in **Figure 2**, the site is located at the junction of Pindimar Road and Myall Way. The nearest noise-sensitive properties are residential dwellings to the east, south, and west of the site, being:

1. 196 Myall Way, Tea Gardens
2. 124 Pindimar Road, Tea Gardens
3. 87 Pindimar Road, Tea Gardens
4. 27 Pindimar Road, Tea Gardens

Koikas Acoustics is advised that 196 Myall Way (Receiver 1) is currently a vacant block with no residence. The structure observed on the site is a metal shed. Correspondence documented between the previous acoustic consultant (West and Associates Pty Ltd) and Mid-Coast Council appears to suggest that noise must still be assessed at the vacant block presuming that it may be occupied in the future.

Receivers 1-4 as nominated above are all assessed for noise impacts in this report.





## 5.0 EXISTING NOISE ENVIRONMENT

Noise logging was conducted at each of the four (4) nearest residential properties (see **Figure 2**) to establish prevailing ambient and background noise conditions. The loggers were on-site from 5 November 2021 to 19 November 2021. The measurement microphone was about 1.5 metres above the natural ground and placed away from sound-reflective surfaces such that recorded data is deemed to represent free-field conditions.

The following instruments were used:

1. Svantek 977 installed at 196 Myall Way
2. NTi Audio XL2 installed at 124 Pindimar Road
3. BSWA 801 installed at 87 Pindimar Road
4. Svantek 957 installed at 27 Pindimar Road

Each instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were stored within the logger memory at recurring 15-minute intervals. G.R.A.S. acoustic windscreens were fitted over each measurement microphone to eliminate the possibility of wind-induced noise influencing the surveyed noise levels.

A NATA-calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. No system drift was observed for any instrument.

Detailed weather survey information was procured from the Bureau of Meteorology (BoM) for the Williamtown RAAF weather station (ID 61078). This was the nearest available weather station that recorded both wind speed and rainfall data at a suitable resolution to allow an accurate correlation of the weather data to noise data at 15-minute intervals. The Williamtown RAAF site is approximately 30 km from the subject site.

An extended two (2) weeks survey period was adopted so that sufficient data was recorded that could account for any data that may have been lost due to adverse weather conditions throughout the monitoring period.



The following is a summary of the recorded background noise levels during the following periods which correspond to the ANL operation hours:

- **DAY** (7 am to 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday).
- **NIGHT** (6 am to 7 am Monday to Friday).

Logger graphs for all surveyed days are presented as an Appendix to this report.

<b>Table 1. Summary of background noise levels [dB]</b>								
<b>Day</b>	<b>ABL – Logger 1</b>		<b>ABL – Logger 2</b>		<b>ABL – Logger 3</b>		<b>ABL – Logger 4</b>	
	<b>Night</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>	<b>Night</b>	<b>Day</b>
Sat 6 Nov 2021	n/a	41	n/a	36	n/a	38	n/a	40
Sun 7 Nov 2021	n/a	37	n/a	32	n/a	34	n/a	37
Mon 8 Nov 2021	38	38	Ext	32	33	38	40	42
Tue 9 Nov 2021	41	40	34	33	35	34	39	39
Wed 10 Nov 2021	42	42	39	35	40	37	40	39
Thu 11 Nov 2021	41	41	36	32	49	36	42	43
Fri 12 Nov 2021	41	44	39	37	39	40	41	44
Sat 13 Nov 2021	n/a	50	n/a	47	n/a	49	n/a	50
Sun 14 Nov 2021	n/a	46	n/a	43	n/a	46	n/a	46
Mon 15 Nov 2021	43	46	41	41	39	45	40	48
Tue 16 Nov 2021	45	40	External battery life exhausted – equipment shutdown after 10 days		39	35	42	41
Wed 17 Nov 2021	42	41			38	37	39	39
Thu 18 Nov 2021	43	40			41	36	42	39
Fri 19 Nov 2021	43	42			40	38	42	42
<b>RBL</b>	<b>42</b>	<b>40</b>	<b>38</b>	<b>33</b>	<b>39</b>	<b>37</b>	<b>41</b>	<b>40</b>
Notes	<ol style="list-style-type: none"> <li>1. <b>Day:</b> 7 am – 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday <b>Night:</b> 6 am – 7 am Monday to Friday</li> <li>2. <b>ABL</b> = Assessment background level</li> <li>3. <b>RBL</b> = Rating background level</li> <li>4. Highlighted cells indicate data excluded from the derivation of the RBLs following EPA monitoring and analysis procedures for weather-affected data.</li> <li>5. 'Ext' refers to an extraneous noise event corrupting the noise data.</li> <li>6. "n/a" refers to a period that has no relevance as the facility will not be operating.</li> </ol>							

Logger data at each of the monitoring locations suggest marginally higher background levels during the 6 am to 7 am 'night shoulder' period (weekdays) than for the 'day' period between 7 am and 6 pm. This would appear to coincide with increased morning traffic movements attributed to people leaving for work.



The data recorded at Locations 1 and 4 appears to show general agreement which would appear to make sense given the similar setbacks from Myall Road.

The loggers at locations 2 and 3, both further removed from Myall Road again show agreement during the night shoulder period where traffic along Myall Road dominates the ambient noise environment. The additional setback from the road would appear to correctly account for the lower measured noise level than for locations 1 and 4.

The higher daytime noise level at Location 3, when compared to Location 2, would again be expected with traffic movements along Pindimar Road becoming more prominent throughout the day. Location 3 has greater exposure to the road and is less setback than Location 2.

Koikas Acoustics is satisfied that the background noise data obtained from the four (4) logging surveys conducted around the ANL site, and the derived RBLs are suitable for use in defining the project noise trigger levels under the NPfl.



## 6.0 NOISE CRITERIA/TRIGGER LEVELS

### 6.1 NOISE POLICY FOR INDUSTRY

The NPfl is provided as a guide in determining suitable project noise objectives when assessing environmental noise impacts associated with scheduled activities prescribed within Schedule 1 of the Protection of the Environment Operations Act 1997. It is also commonly used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

#### 6.1.1 Intrusive and amenity noise levels

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level). The most stringent of the project intrusive noise level and project amenity noise level are applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same. As the intrusive noise level is defined in terms of an  $L_{Aeq, 15 \text{ minutes}}$  and the amenity noise level is defined in terms of an  $L_{Aeq, \text{Period}}$ , a correction +3 dB correction is applied to the project amenity noise level to equate the  $L_{Aeq, \text{Period}}$  to  $L_{Aeq, 15 \text{ minutes}}$ .

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category. There are no non-residential receivers nearby the facility that require assessment.

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when deciding on acceptable noise outcomes.



The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs, which is limited in this case to daytime hours of 7 am to 6 pm (Monday to Friday and 8 am to 4 pm (Saturday and Sunday), and a 6 am to 7 am night shoulder period (Monday to Friday only).

Table 2. NPfl planning levels – $L_{Aeq, 15 \text{ minutes}}$ [dB]								
Period,T (Note 1)	Intrusive		Amenity					PNTL
	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	Project amenity noise level	+3dB correction	
Receiver 1 – 196 Myall Way								
Day	40	45	Rural	50	No	45	48	45
Night	42	47	Rural	40	No	35	38	38
Receiver 2 – 124 Pindimar Road								
Day	33	38	Rural	50	No	45	48	38
Night	38	43	Rural	40	No	35	38	38
Receiver 3 – 87 Pindimar Road								
Day	37	42	Rural	50	No	45	48	42
Night	39	44	Rural	40	No	35	38	38
Receiver 4 –27 Pindimar Road								
Day	40	45	Rural	50	No	45	48	45
Night	41	46	Rural	40	No	35	38	38
Notes:	<div><div>1.</div><div><b>Day:</b> 7 am – 6 pm Monday to Friday and 8 am to 4 pm Saturday and Sunday <b>Night:</b> 6 am – 7 am Monday to Friday</div></div> <div><div>2.</div><div>Project noise amenity level = recommended noise amenity level – 5 dB, except where specific circumstances are met, such as high traffic.</div></div>							

### 6.1.2 Maximum noise levels (Sleep disturbance)

The potential for noise-induced sleep disturbance should be considered where a noise source or activity from a particular development occurs before 7 am (Monday to Saturday) or 8 am (Sundays or public holidays) and/or after 10 pm (Monday to Sunday).

Section 2.5 of the NPfl describes a screening assessment method that identifies the potential for sleep disturbance at residential receivers. Where the screening levels are exceeded, a more detailed maximum noise level assessment is required.

The screening levels noted below are applied in two stages relative to the  $L_{Aeq, 15 \text{ minutes}}$  and  $L_{AFmax}$  source noise levels:



- $L_{Aeq\ 15\ minutes}$  40 dB or the prevailing RBL + 5, whichever is the greater, and/or
- $L_{AFmax}$  52 dB or the prevailing RBL + 15, whichever is the greater.

Specific to this assessment, the screening levels are:

<b>Table 3. Sleep disturbance screening levels</b>			
<b>Receiver location</b>	<b>Assessment period</b>	<b><math>L_{Aeq\ 15\ min}</math> noise level</b>	<b><math>L_{AFmax}</math> noise level</b>
R1: 196 myall Way	6 am to 7 am (Mon-Fri)	47 (RBL + 5)	57 (RBL + 15)
R2: 124 Pindimar Road	6 am to 7 am (Mon-Fri)	43 (RBL + 5)	53 (RBL + 15)
R3: 87 Pindimar Road	6 am to 7 am (Mon-Fri)	44 (RBL + 5)	54 (RBL + 15)
R4: 27 Pindimar Road	6 am to 7 am (Mon-Fri)	46 (RBL + 5)	56 (RBL + 15)

Where the screening assessment identifies a potential for sleep disturbance, a further and more rigorous analysis of the maximum noise levels attributed to the noise source or activity under assessment is prepared. This detailed assessment would:

- Compare the maximum noise levels and the number of maximum noise events from the subject source or activity to that of typical ambient maximum noise events in the local area such as from passing traffic etc.
- Assess the maximum event noise level inside an affected residence and compare this to further guidance on sleep disturbance impacts presented in the NSW EPA Road Noise Policy (RNP).
- Present a final opinion on the potential for sleep disturbance and/or the need for any specific noise mitigation and/or management.

It is also important to recognise that the point at which noise causes sleep disturbance is currently not well known and that the EPA advises that “more research is needed to better understand this relationship”. Therefore, the above should be used as a guide only and applied with caution on a case-by-case basis.

### 6.1.3 Project noise criteria summary

Below is a summary of the relevant noise assessment criteria at each of the four (4) identified nearest residential properties as it relates to the current application.





**Table 4. Summary of project noise criteria**

Receiver location	Operational noise	
	PNTL	Sleep disturbance
R1: 196 Myall Rd	L <sub>Aeq</sub> 15 min (day) 45 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 47 L <sub>Amax</sub> 57
R2: 124 Pindimar Rd	L <sub>Aeq</sub> 15 min (day) 38 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 43 L <sub>Amax</sub> 53
R3: 87 Pindimar Rd	L <sub>Aeq</sub> 15 min (day) 42 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 44 L <sub>Amax</sub> 54
R4: 27 Pindimar Rd	L <sub>Aeq</sub> 15 min (day) 45 L <sub>Aeq</sub> 15 min (night shoulder) 38	L <sub>Aeq</sub> 15 min 46 L <sub>Amax</sub> 56

Noise levels are assessed at a height of 1.5 metres above the ground at the most affected point on or within the residential property boundary. Where the residence is more than 30 metres from the property boundary, noise is assessed at the most affected point on or within 30 metres of the residence.



## 7.0 NOISE MODEL

Predictive modelling (CadnaA) has been used to assess noise levels at each of the identified residential receiver locations. The CadnaA prediction model calculates according to the standard sound propagation algorithms defined in ISO9613, considering the local topography, ground condition, and the presence of noise reflectors/barriers. Equation (3) of ISO9613 (which is adopted by the modelling program) calculates a downwind sound pressure level consistent with wind speeds of 2-5 m/s and moderate temperature inversions.

The acoustic assessments consider a range of design parameters that directly influence the output of the noise prediction model. A summary of the relevant design parameters is provided below:

- Source to receiver wind speeds of 3 m/s at 10 m above ground level.
- Ground absorption is generally taken as 0.7 for moderately porous ground, except for the subject site where a ground absorption of 0.02 is considered for the concrete hardstands.
- Foliage attenuation considered between the subject site and Receivers 1 and 2 presumes 5 m high trees.
- Cumulative noise levels are calculated for all existing and proposed noise sources, assessed over any 15 minutes. All plant and equipment and work processes are considered operational at the same time and no corrections for source duration are applied. This presents a worst-case assessment scenario that is unlikely to occur during a typical operation.
- An extensive survey of existing plant and equipment noise levels at the Tea Gardens facility has been conducted by Koikas Acoustics. This data is used where possible and appropriate to represent noise emission from existing and proposed plant and equipment and site operations. Additional data collected by Ray Walsh Acoustics for another ANL baling and storage shed at Holbrook is used to predict noise emissions from these new buildings. Koikas Acoustics database noise levels are used elsewhere where no site-specific noise data is available.



## 8.0 OPERATIONAL NOISE

Noise emission from the ANL Tea Gardens facility when operating under the proposal which would allow receipt and processing of FOGO materials in addition to the existing approved wood waste materials is assessed to surrounding residential receivers.

### 8.1 ASSESSMENT SCENARIOS

The following design scenarios as listed in **Table 5** are assessed.

<b>Table 5. Design scenarios and assumptions</b>	
<b>Scenario</b>	<b>Description</b>
1A [Day]	<ul style="list-style-type: none"><li>• Four trommel screens operating and being loaded.</li><li>• One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li><li>• The silt trap pump is operating continuously.</li><li>• Two truck movements are assessed, one inward and one outward.</li><li>• High-speed grinder operating inside the wood waste processing shed (roller doors closed).</li><li>• All other buildings are assessed with roller doors open.</li></ul>
1B [Day]	<ul style="list-style-type: none"><li>• Four trommel screens operating and being loaded.</li><li>• One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li><li>• The silt trap pump is operating continuously.</li><li>• Two truck movements are assessed, one inward and one outward.</li><li>• Low-speed shredder operating inside the wood waste processing shed (roller doors open).</li><li>• All other buildings are assessed with roller doors open.</li></ul>
2 [Night]	<ul style="list-style-type: none"><li>• No external screeners are permitted to operate between 6 am and 7 am.</li><li>• One loader is spreading material on the FOGO maturation bed and two other loaders are working around the material storage bays.</li><li>• The silt trap pump is operating continuously.</li><li>• Two truck movements are assessed, one inward and one outward.</li><li>• Roller doors in the wood waste processing shed must be kept closed.</li><li>• All other buildings are assessed with roller doors open.</li></ul>
3 [Night]	<p>SLEEP DISTURBANCE</p> <ul style="list-style-type: none"><li>• All plant and equipment (excluding outdoor screeners and shredders).</li><li>• Wood waste processing shed roller doors must be closed at all times and the grinder must not be used.</li><li>• All other buildings are assessed with roller doors open.</li><li>• Two truck movements (one inward and one outward).</li></ul>

### 8.2 SOURCE NOISE LEVELS

Noise levels used in the acoustic model have been sourced from:

1. Measurements taken by Koikas Acoustics at the existing ANL Tea Gardens site,
2. Measurements taken by Ray Walsh Acoustics at another ANL facility in Holbrook, and
3. Database noise levels from previous measurements conducted by Koikas Acoustics at other similar sites.

**Table 6** lists the sound power levels for all equipment.

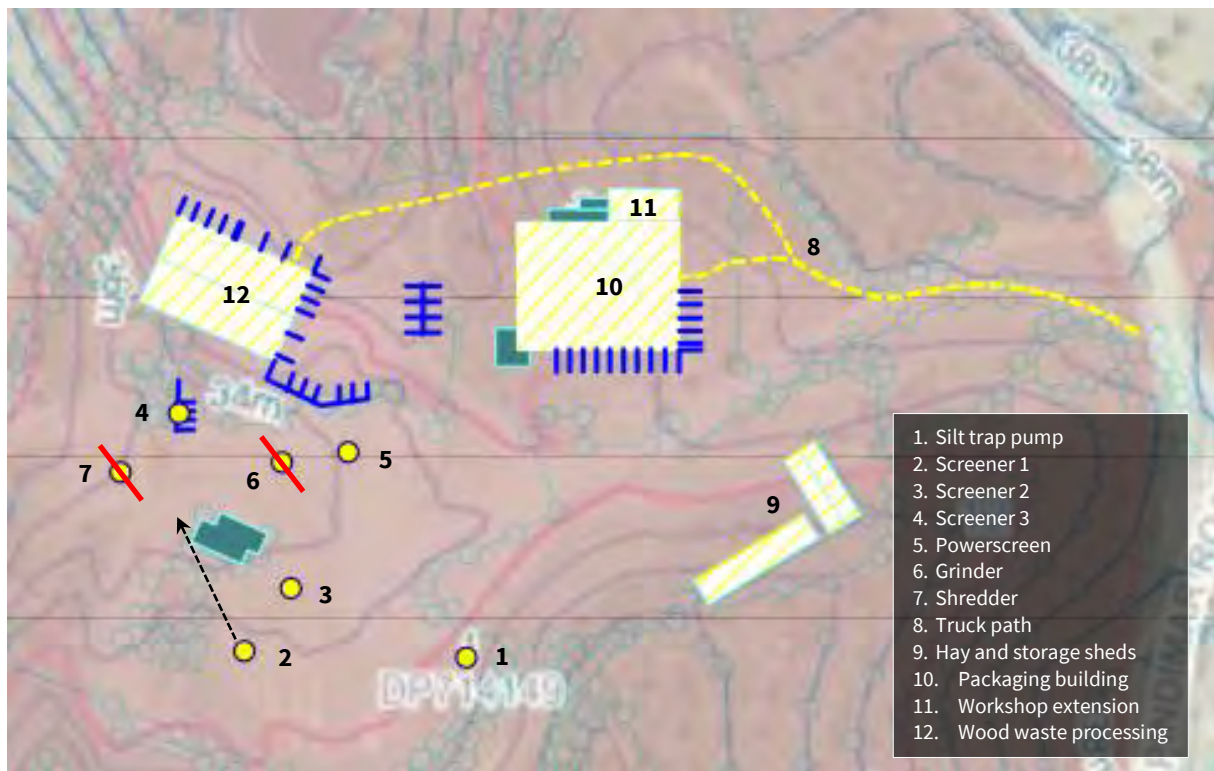
Table 6. Noise level data, L <sub>Aeq</sub> dB										
Source	Noise metric	1/1 octave band centre frequency [Hz]								Total
		63	125	250	500	1k	2k	4k	8k	
Externally located noise sources around the site										
Existing silt trap pump	SWL	78	79	82	90	93	93	89	84	98
Excavator	SWL	76	86	90	89	90	89	86	80	97
Loader	SWL	64	73	80	86	98	92	79	70	99
Screeners 1 and loading	SWL	81	93	94	96	96	92	88	81	102
Screeners 2 and loading	SWL	79	84	90	94	95	96	90	82	101
Screeners 3 and loading	SWL	75	75	81	92	95	96	94	87	101
Turbo Powerscreen	SWL	94	97	93	96	97	96	92	89	104
Truck moving at 10 kph	SWL	72	77	83	85	86	83	80	70	91
Hay baling shed										
Vacuum sealer and baler	SWL	60	68	80	84	82	89	89	89	95
Conveyor and baler	SWL	74	91	99	100	97	93	89	83	105
Hay storage shed										
Forklift	SWL	71	81	75	81	82	80	78	69	88
Workshop										
Engineering workshop internal room noise level	SPL <sub>(Room)</sub>	40	51	53	58	63	72	73	68	77
Existing packaging and distribution shed										
Truck idling	SWL	69	71	75	85	92	90	85	75	95
Forklift loading truck	SWL	71	81	75	81	82	80	78	69	88
Wood Waste Processing Shed										
Aerosorb fan	SWL	69	81	83	85	88	86	81	70	93
Aerosorb fan	SWL	69	81	83	85	88	86	81	70	93
Screeners	SWL	94	97	93	96	97	96	92	89	104
Low-speed shredder	SWL	80	90	94	98	99	97	93	89	104
High-speed grinder	SWL	94	105	108	112	113	111	107	102	118
Truck being loaded using a wheeled loader	SWL	92	86	89	94	97	96	94	90	102

**Table 7** presents the total sound power level for all equipment within each building and the calculated reverberant room noise level in each building.

Table 7. Noise levels inside buildings, L <sub>Aeq</sub> dB										
Source	Noise metric	1/1 octave band centre frequency [Hz]								Total
		63	125	250	500	1k	2k	4k	8k	
Hay baling shed										
Total sound power level	SWL <sub>(Total)</sub>	74	91	99	100	97	95	92	90	105
Reverb room noise level	SPL <sub>(Room)</sub>	54	70	79	80	77	74	71	69	85
Hay storage shed										
Total sound power level	SWL <sub>(Total)</sub>	71	81	75	81	82	80	78	69	88
Reverb room noise level	SPL <sub>(Room)</sub>	52	63	56	63	63	62	59	51	70
Workshop										
Engineering workshop internal room noise level	SPL <sub>(Room)</sub>	40	51	53	58	63	72	73	68	77
Existing packaging and distribution shed										
Total sound power level	SWL <sub>(Total)</sub>	73	82	78	87	92	91	86	76	96
Reverb room noise level	SPL <sub>(Room)</sub>	50	59	55	64	70	68	63	53	73
Wood Waste Processing Shed (low-speed shredder operating)										
Total sound power level	SWL <sub>(Total)</sub>	96	98	97	101	103	101	98	94	108
Reverb room noise level	SPL <sub>(Room)</sub>	71	72	71	74	76	74	70	64	82
Wood Waste Processing Shed (high-speed grinder operating)										
Total sound power level	SWL <sub>(Total)</sub>	98	106	108	112	114	112	107	103	118
Reverb room noise level	SPL <sub>(Room)</sub>	73	80	82	85	87	85	79	73	92

**Figure 3** presents a layout indicating the location of each noise source as it was during the attended surveys conducted by Koikas Acoustics, and as per the approved building locations.

It is noted that items 6 and 7, being the low-speed shredder and high-speed grinder are relocated within the new wood waste processing building and item 2 which is showing in the maturation bed is moved further north.



**Figure 3.** Location of site noise sources

### 8.3 RECEIVER LEVELS – SCENARIO 1A [DAYTIME]

The following noise levels are calculated for each of the identified surrounding residential receivers. As each residence is greater than 30 m from the boundary, noise levels are assessed at the most affected point within 30 m of the residence. Other pertinent information regarding the model includes:

- All noise sources are presumed to operate constantly for over 15 minutes, excluding the truck movements where the noise duration is controlled by the vehicle's speed and distance of travel.
- The high-speed grinder is located inside the wood waste processing building. During the use of the high-speed grinder, the building doors must be closed.
- All roller doors to the packaging building and workshop are presumed open.
- Two truck movements are presumed to occur in any 15 minutes, one (1) to the existing packaging shed and the other to the wood waste processing shed.
- Sound transmission through tilt-up masonry walls will be negligible and does not warrant inclusion in the noise model.
- Sound transmission through the roof is based on sound transmission loss data for insulated roof panels ( $R_w$  24).



Table 8. Scenario 1A receiver levels (L <sub>Aeq</sub> 15-minutes, dB)			
Receiver	Noise objective	Predicted noise level	Assessment result
R1: 196 myall Way	45	43	Complies
R2: 124 Pindimar Road	38	35	Complies
R3: 87 Pindimar Road	42	40	Complies
R4: 27 Pindimar Road	45	43	Complies

#### 8.4 RECEIVER LEVELS – SCENARIO 1B [DAYTIME]

Scenario 1B considers the same noise sources as those from Scenario 1A but with one exception being the low-speed shredder is operating within the wood waste processing shed rather than the high-speed grinder. Considering that the low-speed shredder generates substantially lower noise than the high-speed grinder, the model allows for the roller doors to the wood waste processing shed to be **OPEN**.

Table 9. Scenario 1B receiver levels (L <sub>Aeq</sub> 15-minutes, dB)			
Receiver	Noise objective	Predicted noise level	Assessment result
R1: 196 myall Way	45	43	Complies
R2: 124 Pindimar Road	38	34	Complies
R3: 87 Pindimar Road	42	40	Complies
R4: 27 Pindimar Road	45	43	Complies

#### 8.5 RECEIVER LEVELS – SCENARIO 2 [6 AM TO 7 AM]

To achieve acoustic compliance during the night-shoulder period, the operation of the grinder, externally located screeners and shredders must not occur. Furthermore, the roller doors to the new wood waste processing building would need to be closed to contain noise within that building.

With the above controls included, the following noise levels are calculated for each of the identified surrounding residential receivers.

Table 10. Scenario 2 receiver levels (L <sub>Aeq</sub> 15-minutes, dB)			
Receiver	Noise objective	Predicted noise level	Assessment result
R1: 196 myall Way	38	38	Complies
R2: 124 Pindimar Road	38	30	Complies
R3: 87 Pindimar Road	38	35	Complies
R4: 27 Pindimar Road	38	38	Complies



## 8.6 RECEIVER LEVELS – SCENARIO 3 [SLEEP DISTURBANCE]

The maximum noise level assessment for site operations between 6 am and 7 am, presuming the above controls measures adopted during this period (ie. no use of screeners, shredders, or the grinder), considers only:

- Breakout noise from plant and equipment in the hay baling and storage shed.
- Breakout noise from plant and equipment in the packaging shed.
- Breakout noise from plant and equipment in the workshop.
- Breakout noise from plant and equipment in the wood waste processing shed.
- Truck air brakes when inside both the wood waste processing shed and packaging shed (Note: the model assumes that the air brakes activate when inside each shed and with the roller doors open – the wood waste processing shed roller doors would then need to close per earlier acoustic control recommendations for 6 am to 7 am operation).
- Silt trap pump noise.
- Loaders operating around the material storage bays and FOGO maturation bed.
- Truck movements.

The truck air brakes are expected to have the greatest potential to generate maximum noise levels above the maximum trigger level. The sound power level of the truck air brakes is calculated to be  $L_{Amax}$  117 dB. The corresponding internal reverberant sound pressure level in both the packaging shed and wood waste processing shed becomes  $L_{Amax}$  95 dB and 97 dB respectively. These levels are well above the maximum levels generated by the internal plant and equipment and general operations.

The  $L_{Amax}$  sound power level from external sources such as the silt trap pump and truck movements have little influence on the maximum levels calculated at each receiver site. The adopted sound power levels in the model are  $L_{Amax}$  99 dB for the silt trap pump and 97 dB for the low-speed truck pass-by.

$L_{Amax}$  levels in the hay baling shed are currently unknown as the Ray Walsh acoustic report only presents  $L_{Aeq}$  noise levels. Koikas Acoustics has conservatively adopted an  $L_{Amax}$  sound power level that is 10 dB higher than the corresponding  $L_{Aeq}$  sound power level for internal work in the baling shed.



The forklift  $L_{Amax}$  level is approximately 8 dB above the  $L_{Aeq}$  level and this correction is adopted in the model for the hay storage shed. Maximum levels from this area are negligible. Similarly, the workshop maximum noise levels, although well above the  $L_{Aeq}$  level (+13 dB), are still not significant at the residential receiver locations.

The result of the maximum noise levels assessment is that the following levels are calculated for each residential receiver:

<b>Table 11. Scenario 3 receiver levels (<math>L_{AFmax}</math>, dB)</b>			
<b>Receiver</b>	<b>Noise objective</b>	<b>Predicted noise level</b>	<b>Assessment result</b>
R1: 196 myall Way	57	49	Complies
R2: 124 Pindimar Road	53	33	Complies
R3: 87 Pindimar Road	54	37	Complies
R4: 27 Pindimar Road	56	39	Complies

## 8.7 RECOMMENDATIONS

The following recommendations are provided as a result of the assessment of noise emission from the ANL Tea Gardens facility under the current proposal for alterations and additions to the site:

1. The high-speed grinder and low-speed shredder are to be located within the new wood waste processing building.
2. The high-speed grinder shall not be used at any time before 7 am.
3. When the high-speed grinder is in use, the roller doors to the wood waste processing building must be closed to contain noise within the building.
4. Between 6 am and 7 am, externally located screeners and/or shredders shall not be operated.
5. Between 6 am and 7 am, roller doors in the wood waste processing shed are to be closed. Roller doors to all other sheds and buildings may remain open if needed.



## 9.0 CONCLUSION

Koikas Acoustics Pty Ltd was requested to provide an acoustical assessment of a proposal to allow receipt and processing of up to 50,000 TPA (tonnes per annum) of food organics and garden organics (FOGO) material at the existing waste wood processing and landscape material supplies facility at 12 Pindimar Road, Tea Gardens.

Operational noise from the site is assessed to current EPA noise objectives taken from the NPfI. Considering the existing approved hours of operation of the site, of which there will be no change, the assessment considers noise emissions during the 6 am to 7 am night shoulder period, and during the standard daytime hours (as defined by the NSW EPA in the NPfI).

The proposal will not introduce additional on-site noise sources nor result in any additional vehicle traffic on-site or on-road. It simply relates to adding FOGO feedstock to the existing wood waste material the site currently handles. The overall site tonnage of 150,000 TPA will not change, only the allocation will change to 50,000 TPA FOGO and 100,000 TPA wood waste.

Acoustic controls previously advised for the site under DA-9/2021 and that form part of that approval is retained for this assessment. No additional controls are required to retain acoustic compliance under the current proposal. **Sections 8.3 to 8.6** and **Tables 8 to 11** of this report demonstrate that the assessed noise levels comply at all identified receivers.



# APPENDIX A

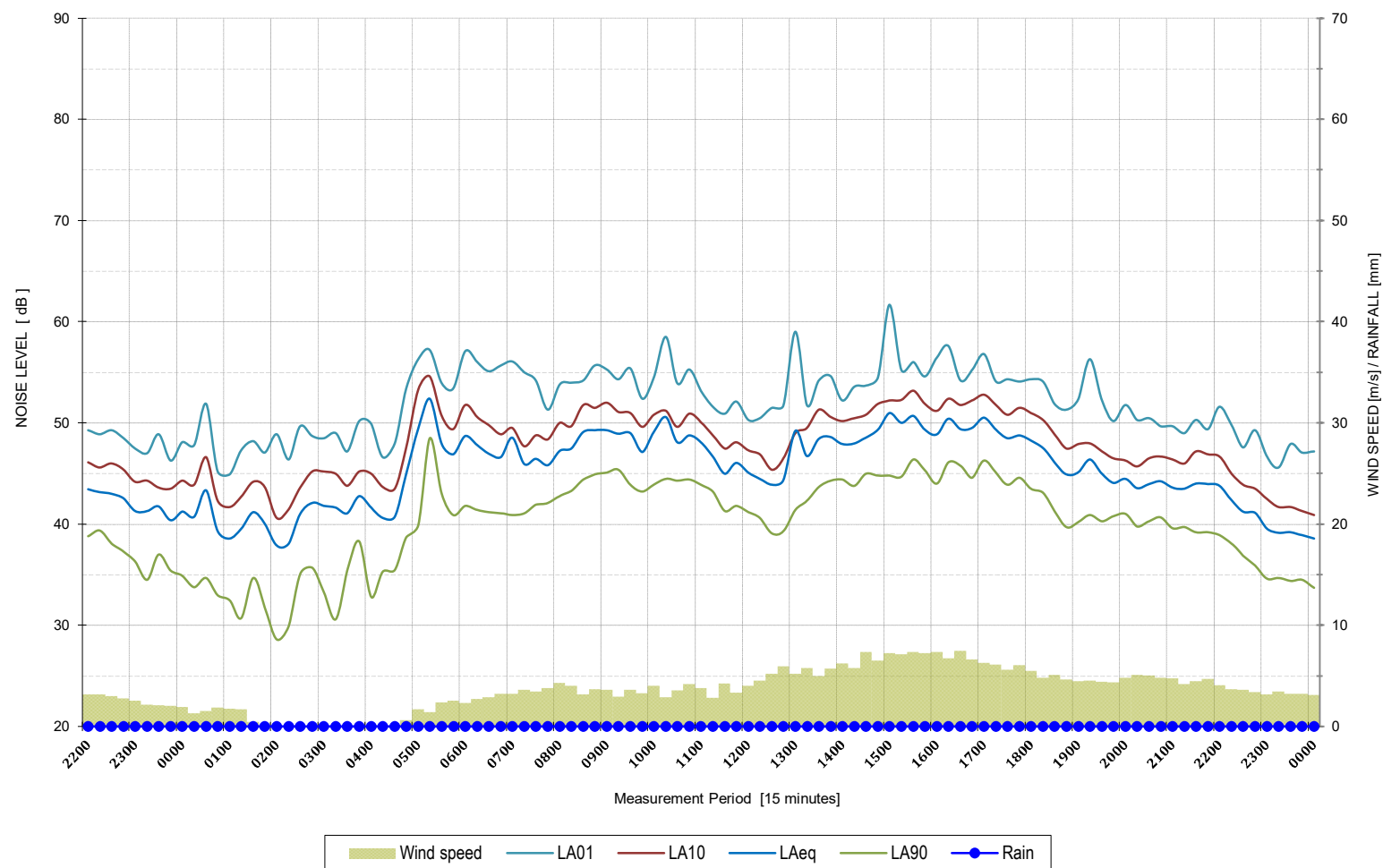
## APPENDIX A

# APPENDIX A

DAY 1

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

DATE: Saturday, 6 November 2021

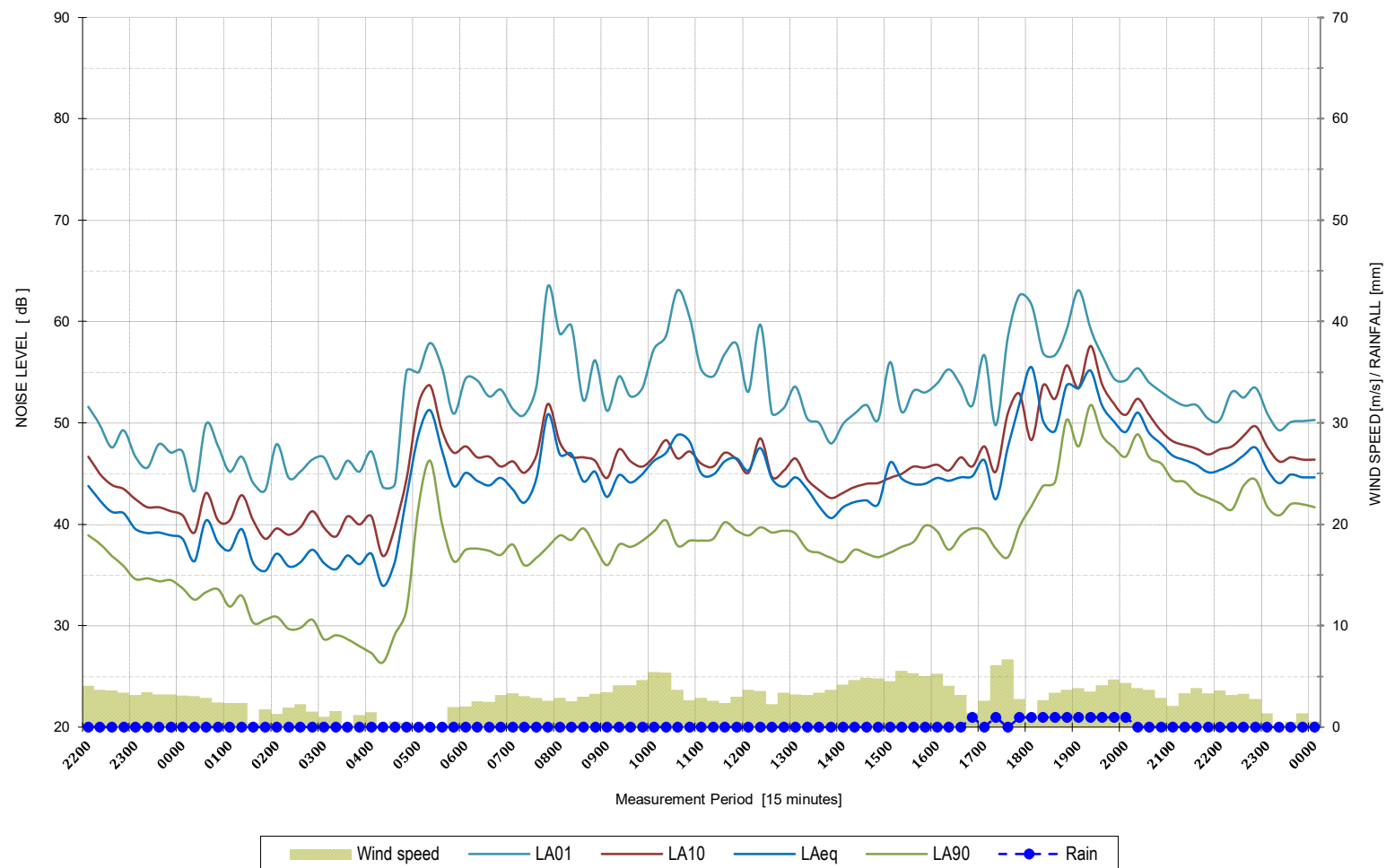




DAY 2

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

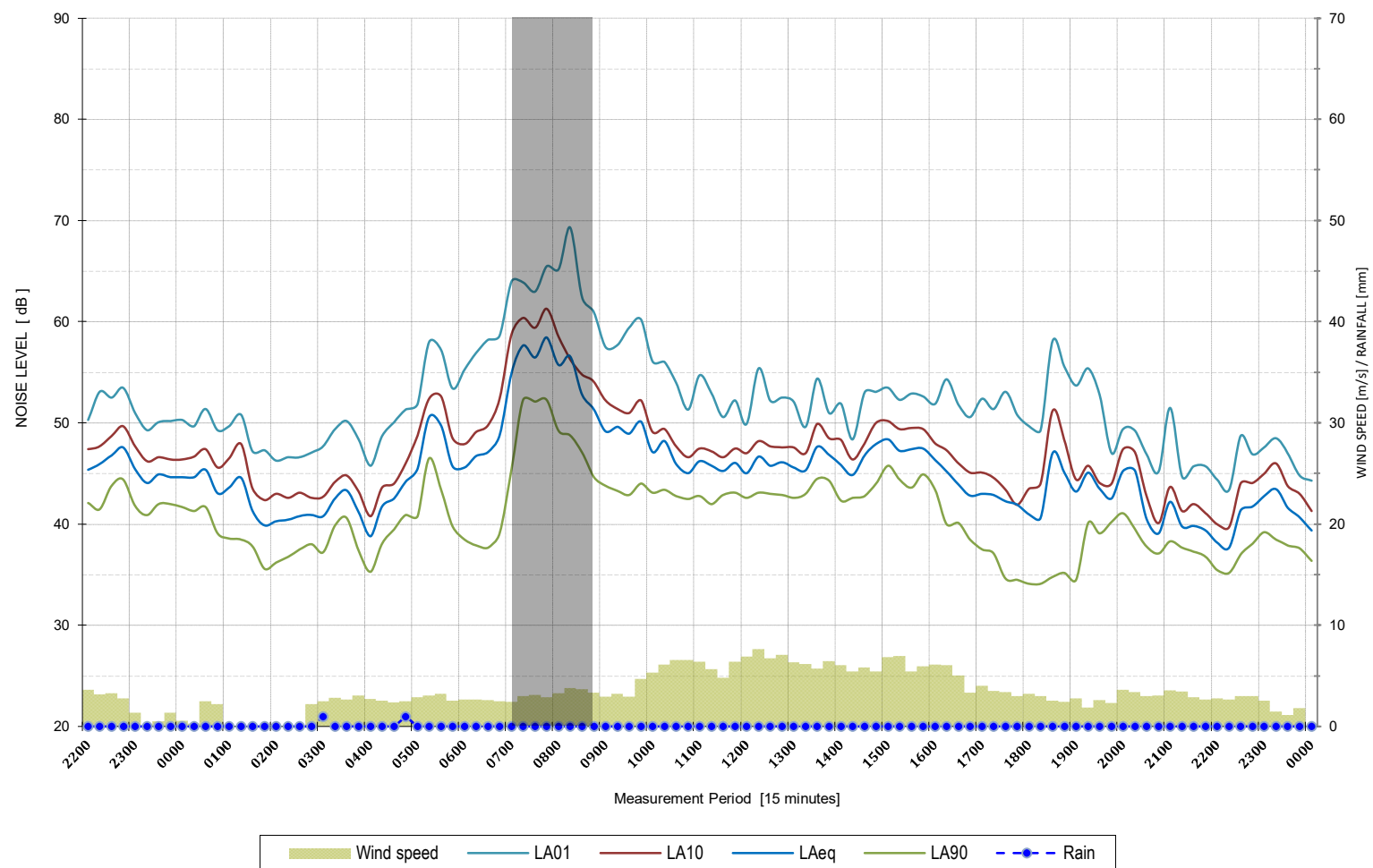
DATE: Sunday, 7 November 2021



DAY 3

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

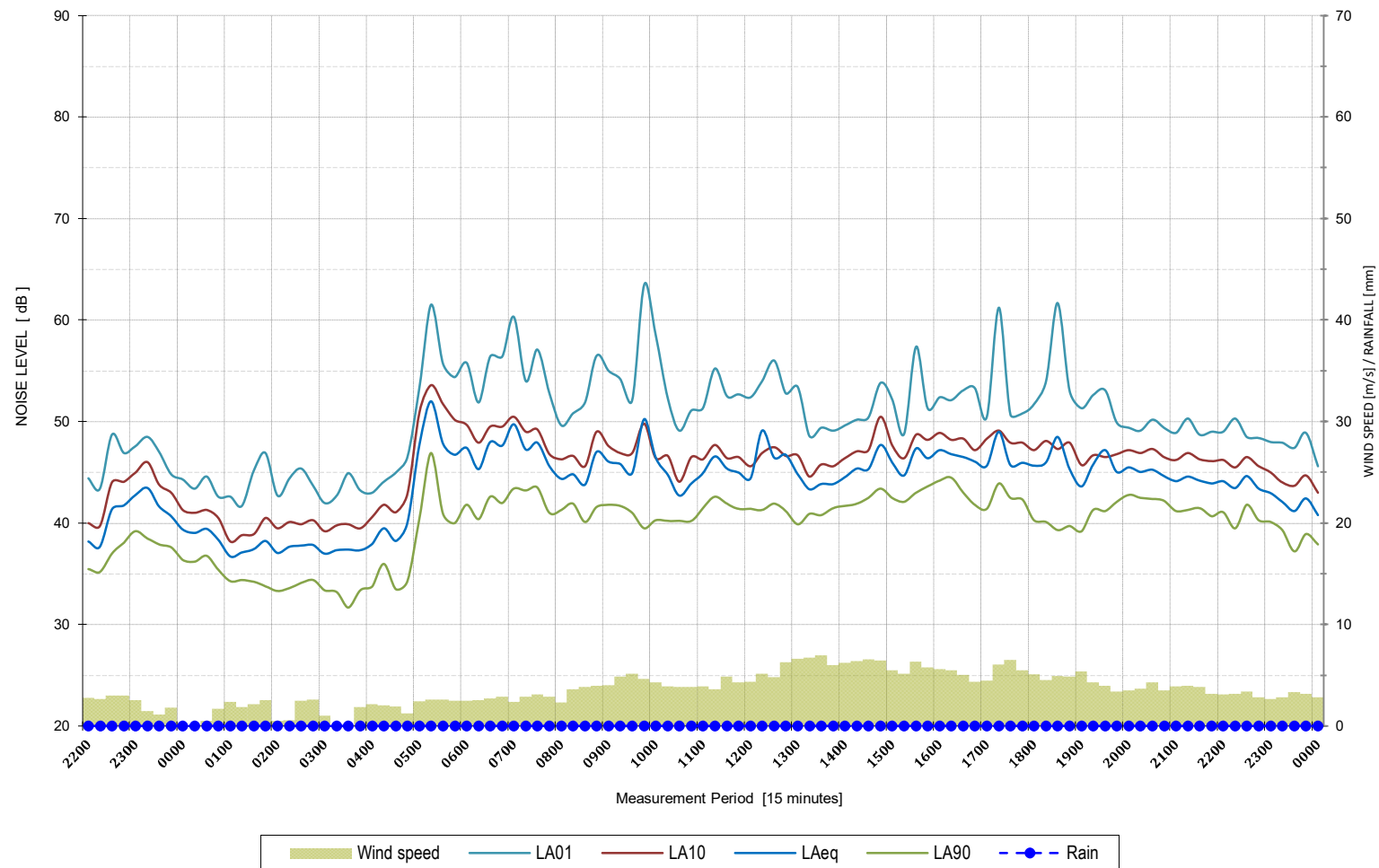
DATE: Monday, 8 November 2021



DAY 4

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

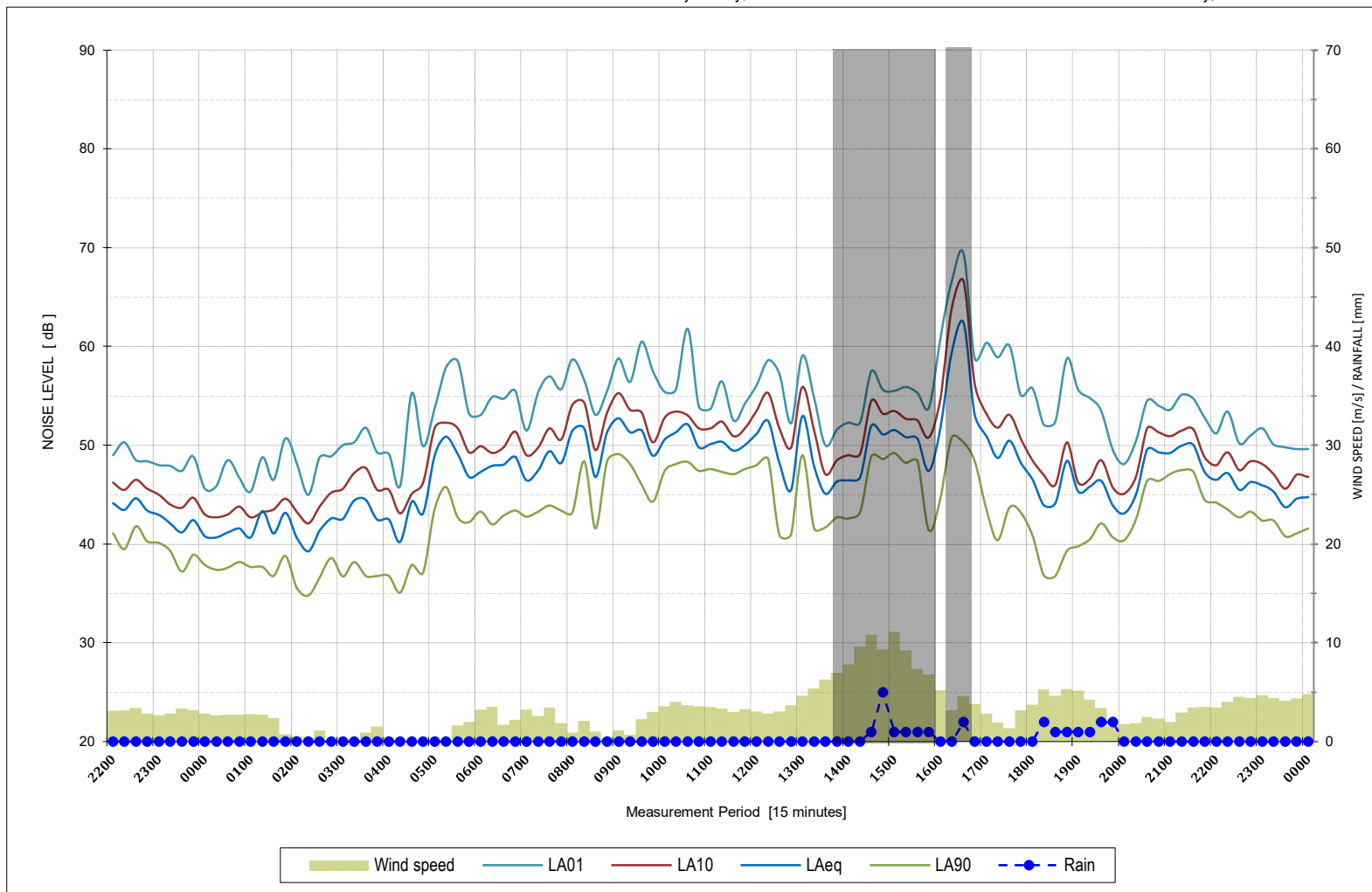
DATE: Tuesday, 9 November 2021



DAY 5

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

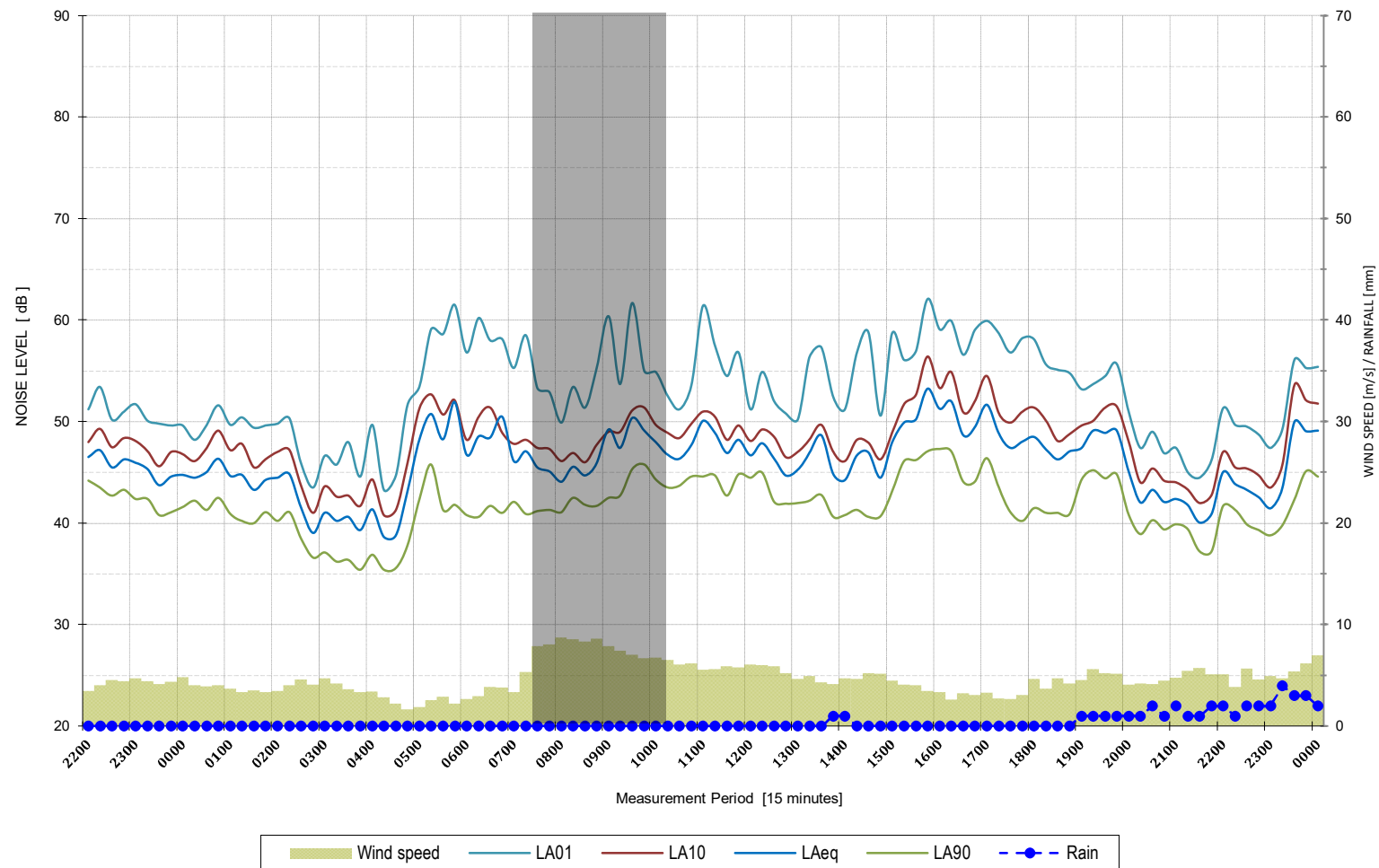
DATE: Wednesday, 10 November 2021



DAY 6

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

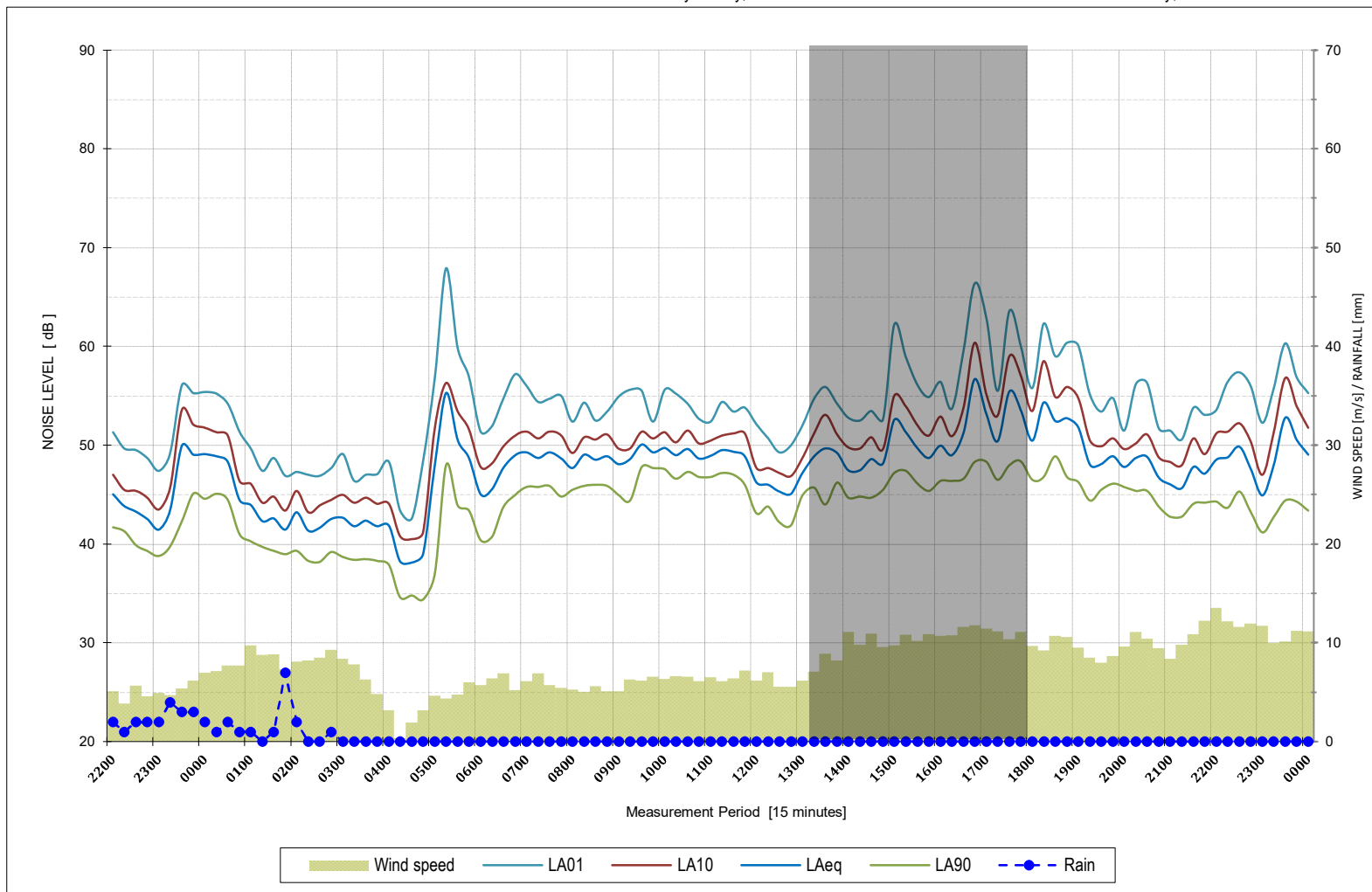
DATE: Thursday, 11 November 2021



DAY 7

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

DATE: Friday, 12 November 2021



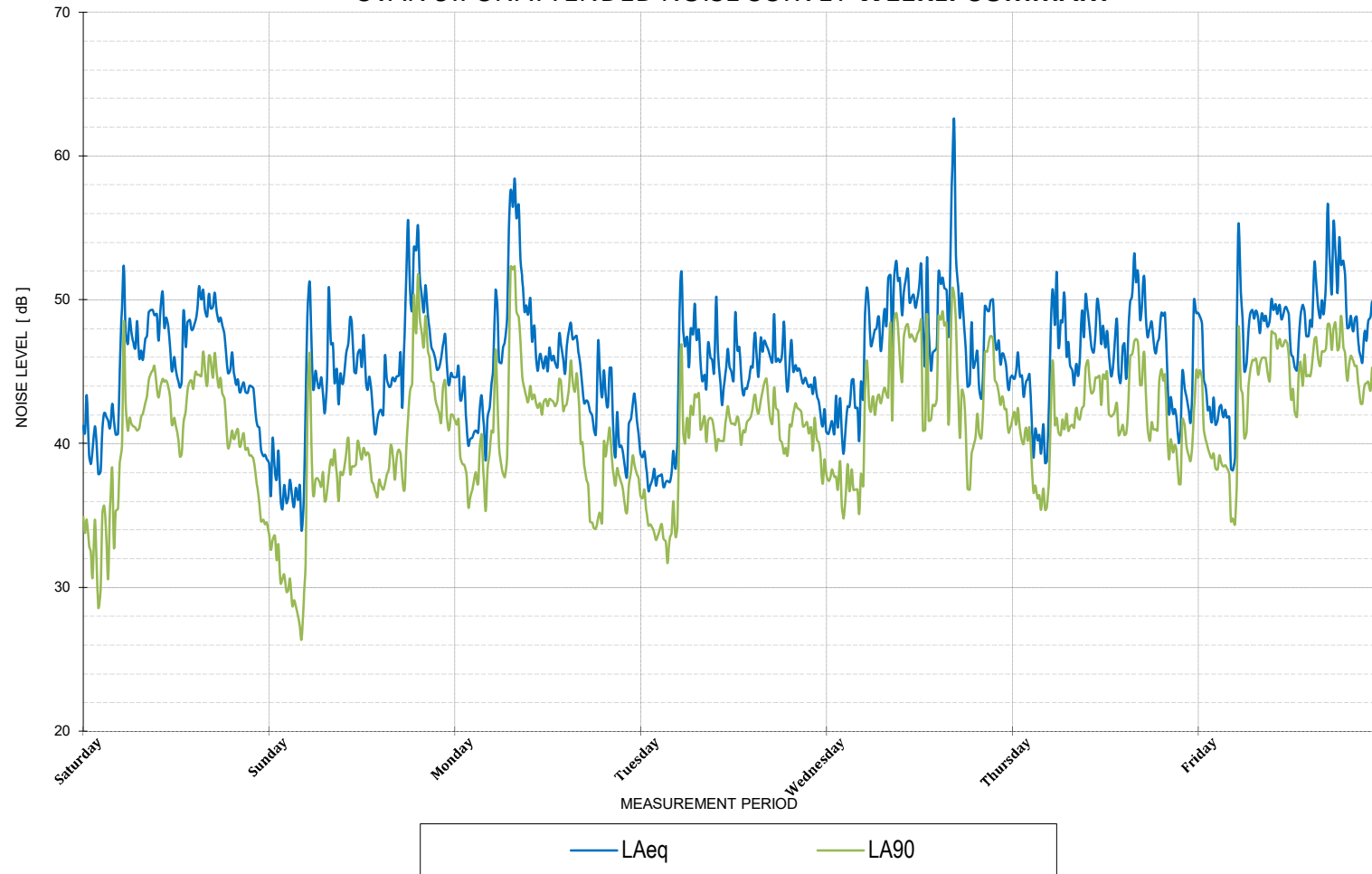


WEEKLY SUMMARY

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

PERIOD: 6th to the 11th November 2021

SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY

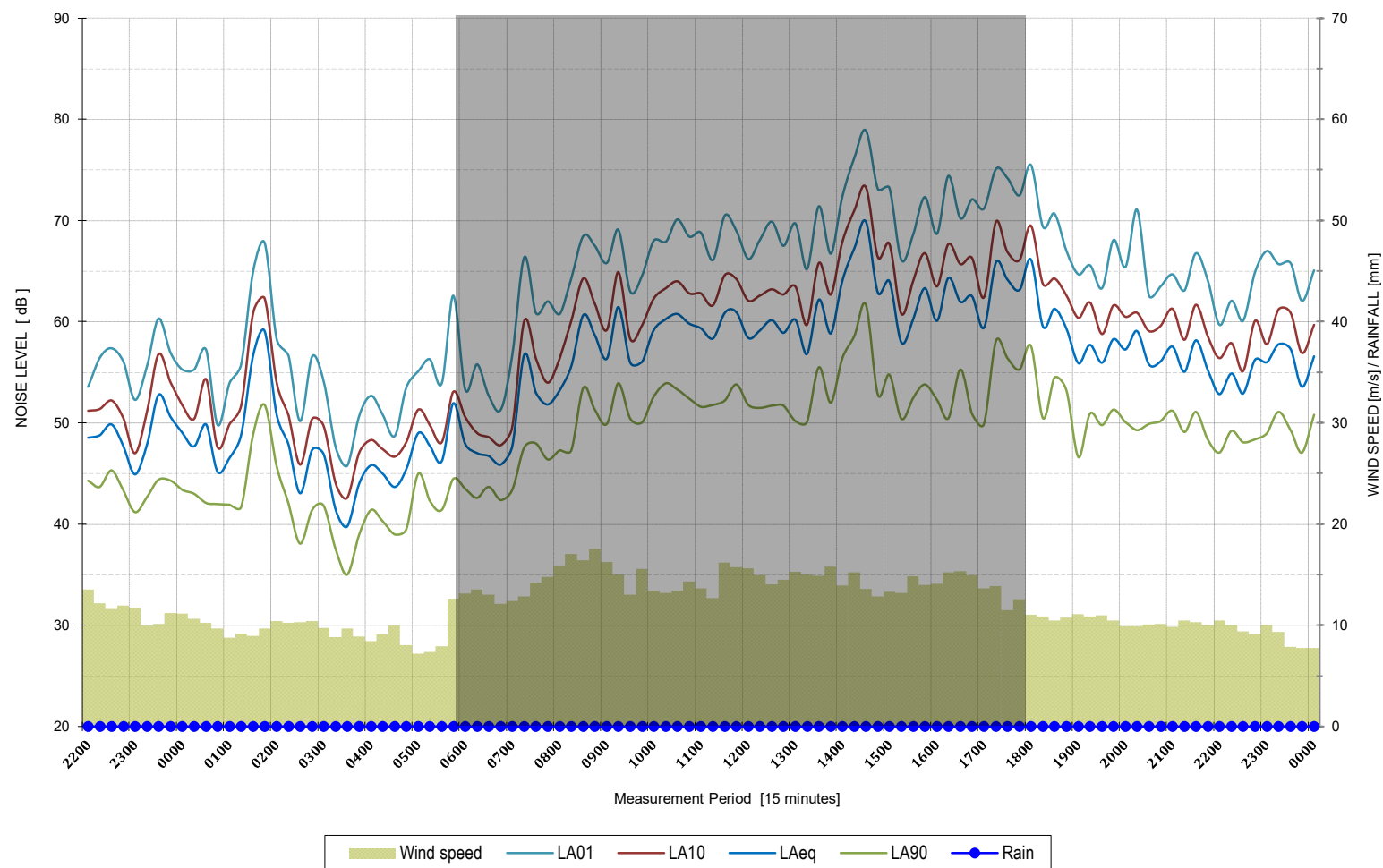


Sundays and Public Holidays the hours change to 0800

DAY 1

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

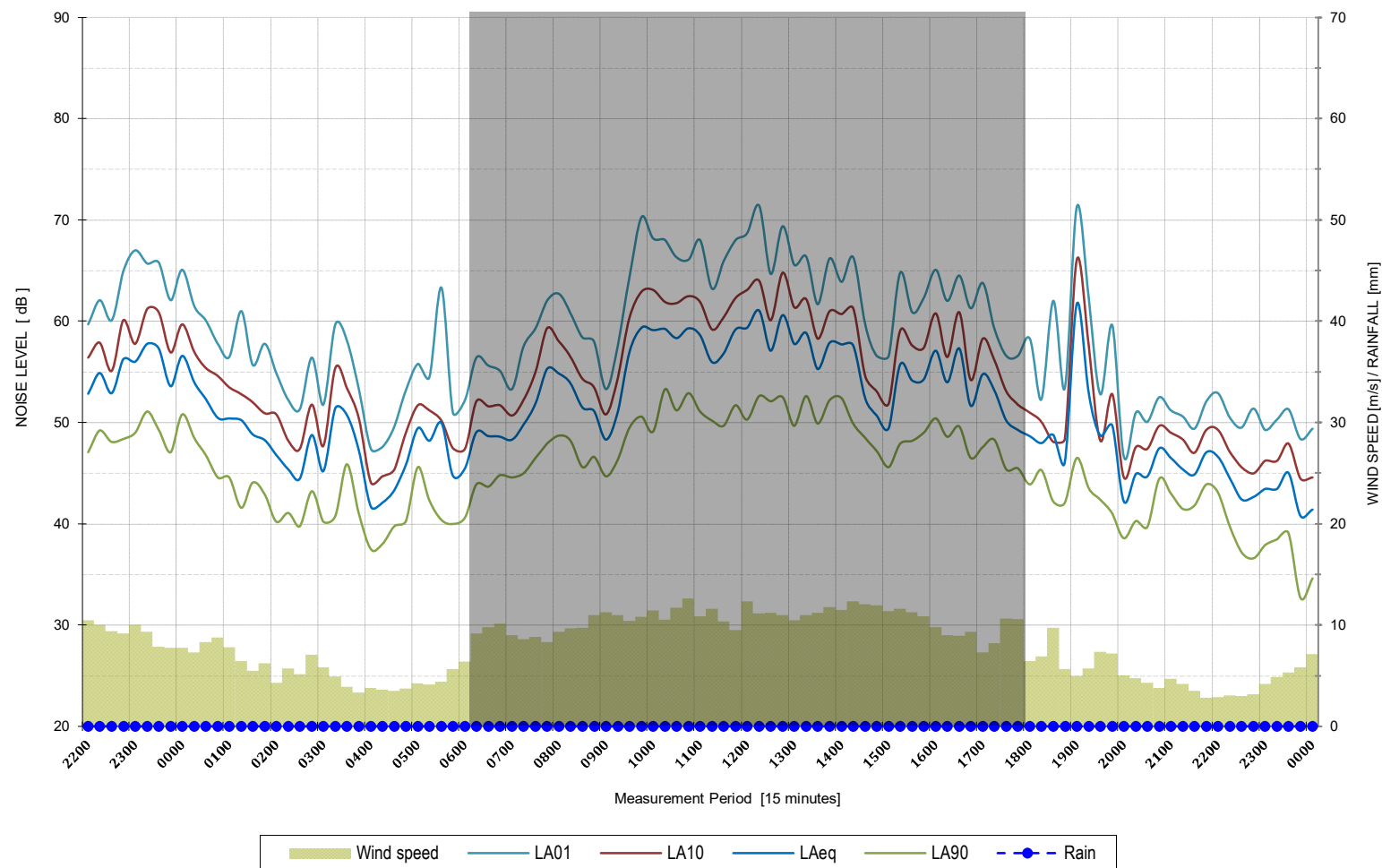
DATE: Saturday, 13 November 2021



DAY 2

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

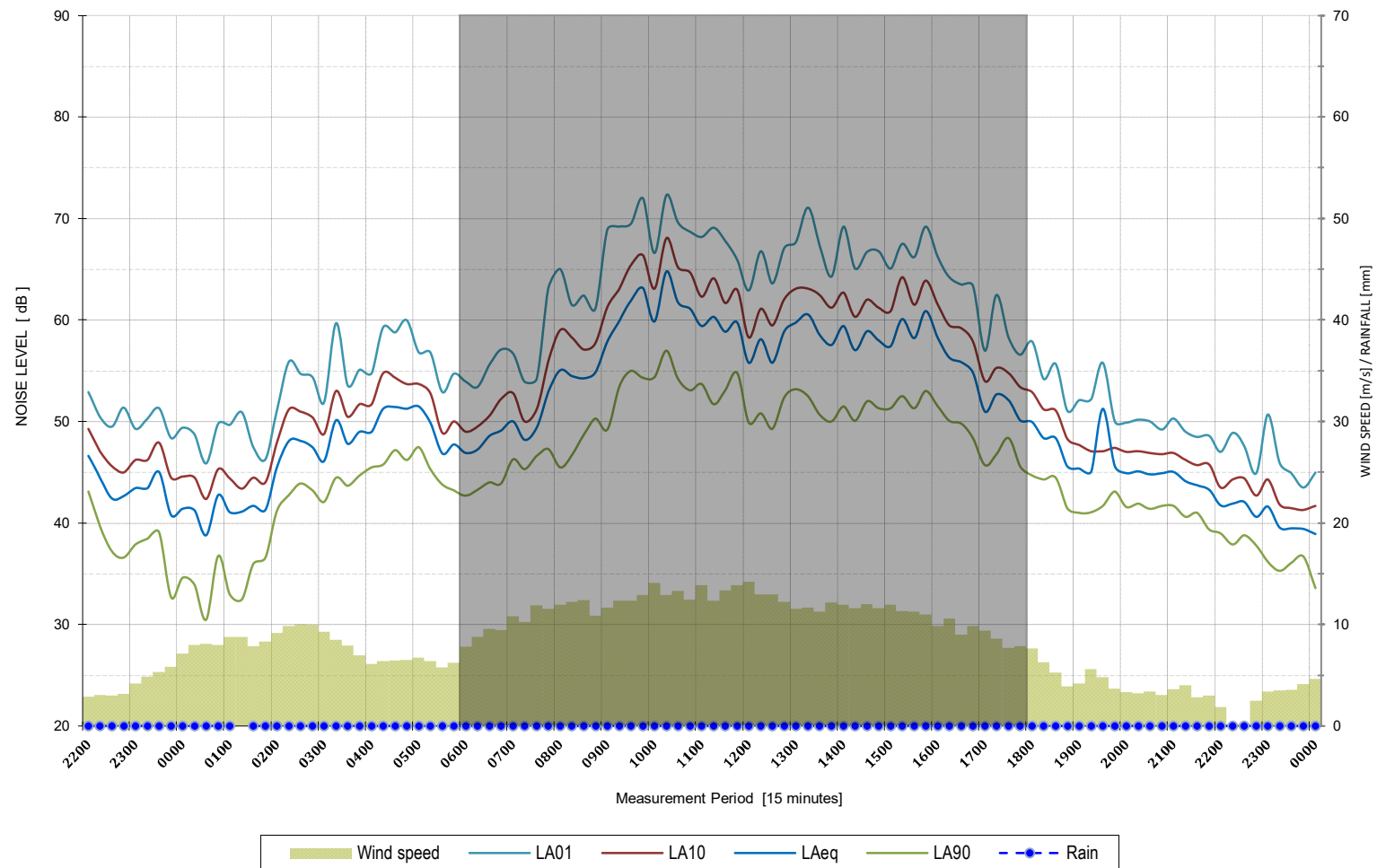
DATE: Sunday, 14 November 2021



DAY 3

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

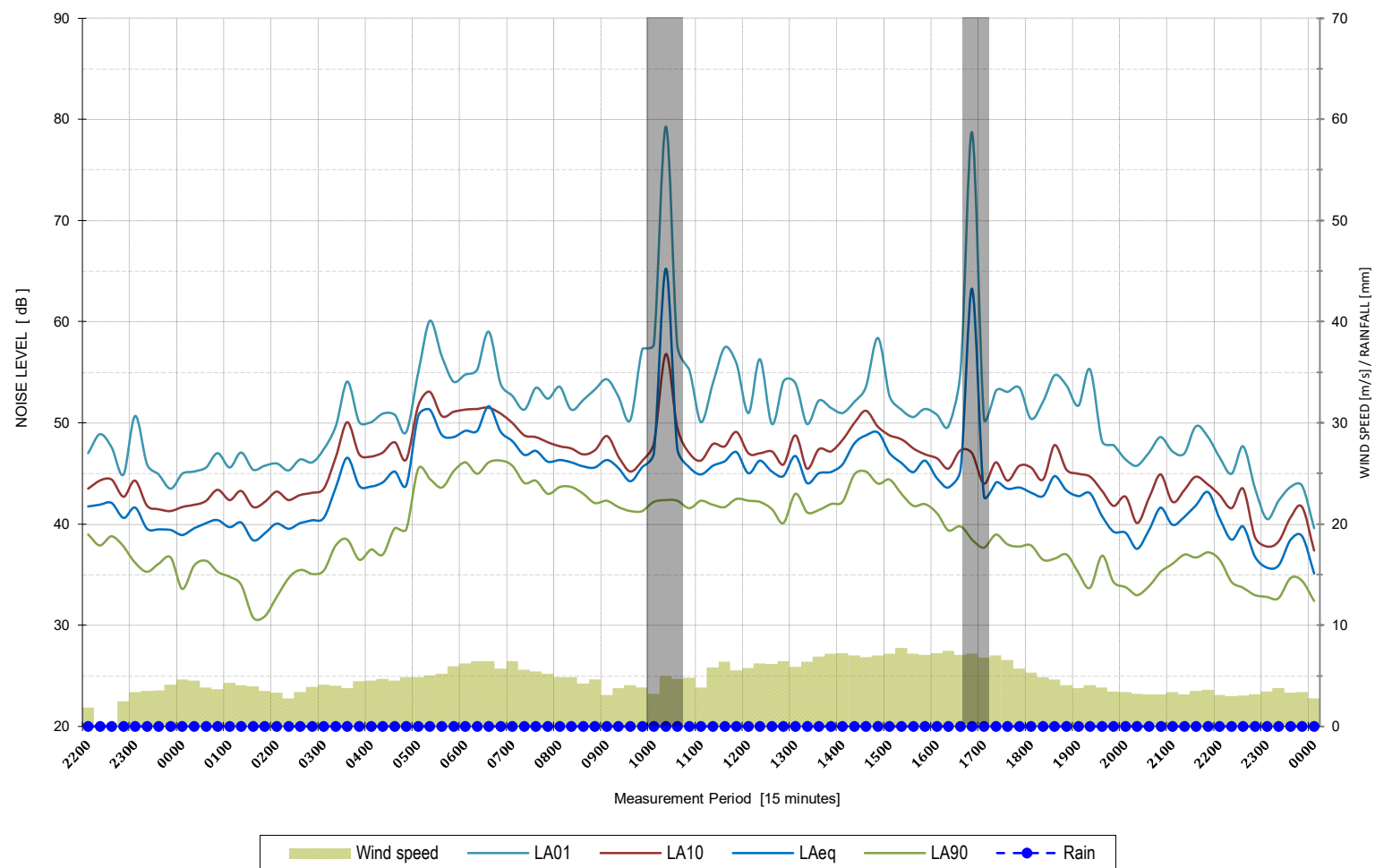
DATE: Monday, 15 November 2021



DAY 4

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

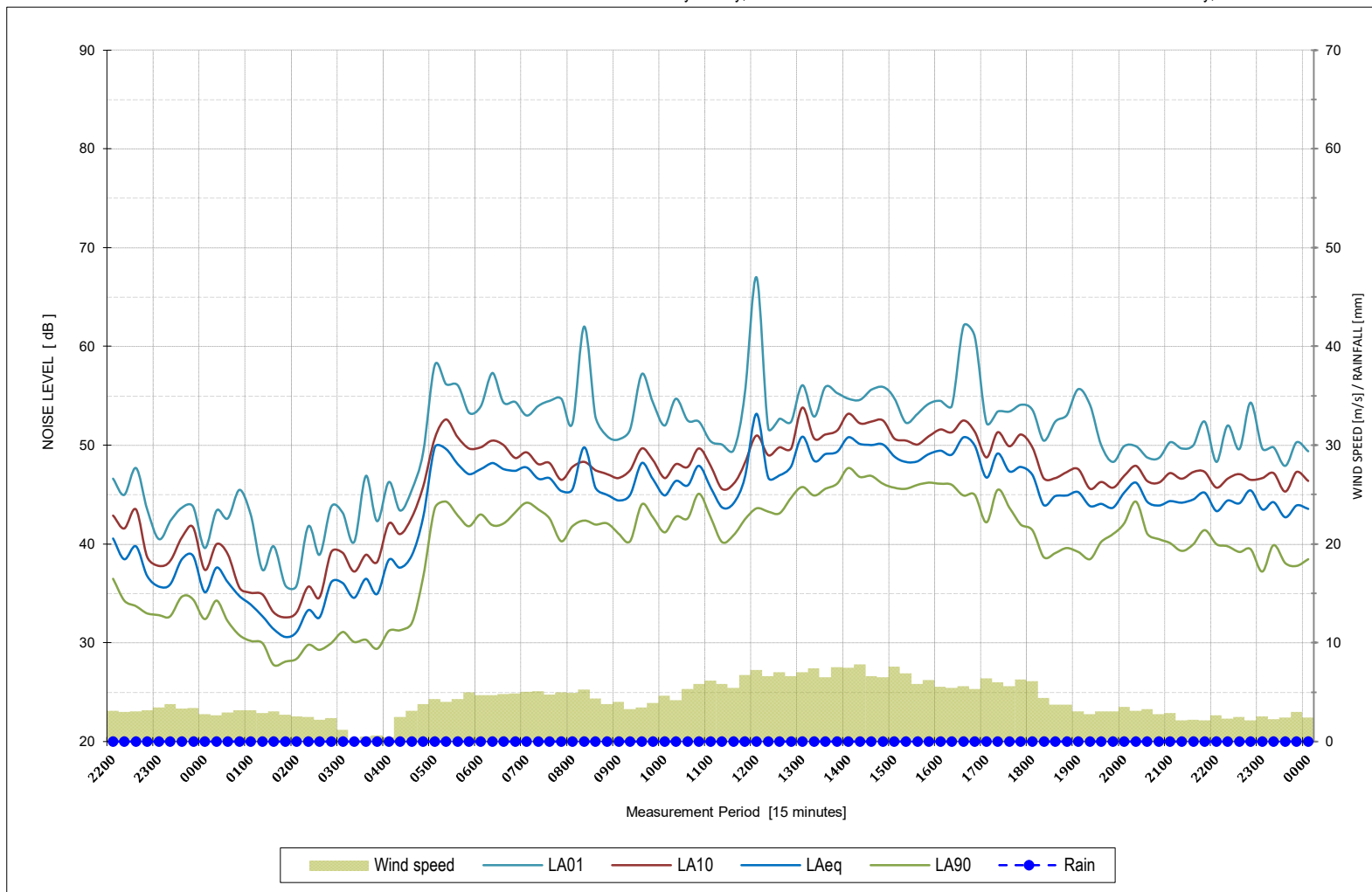
DATE: Tuesday, 16 November 2021



DAY 5

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

DATE: Wednesday, 17 November 2021

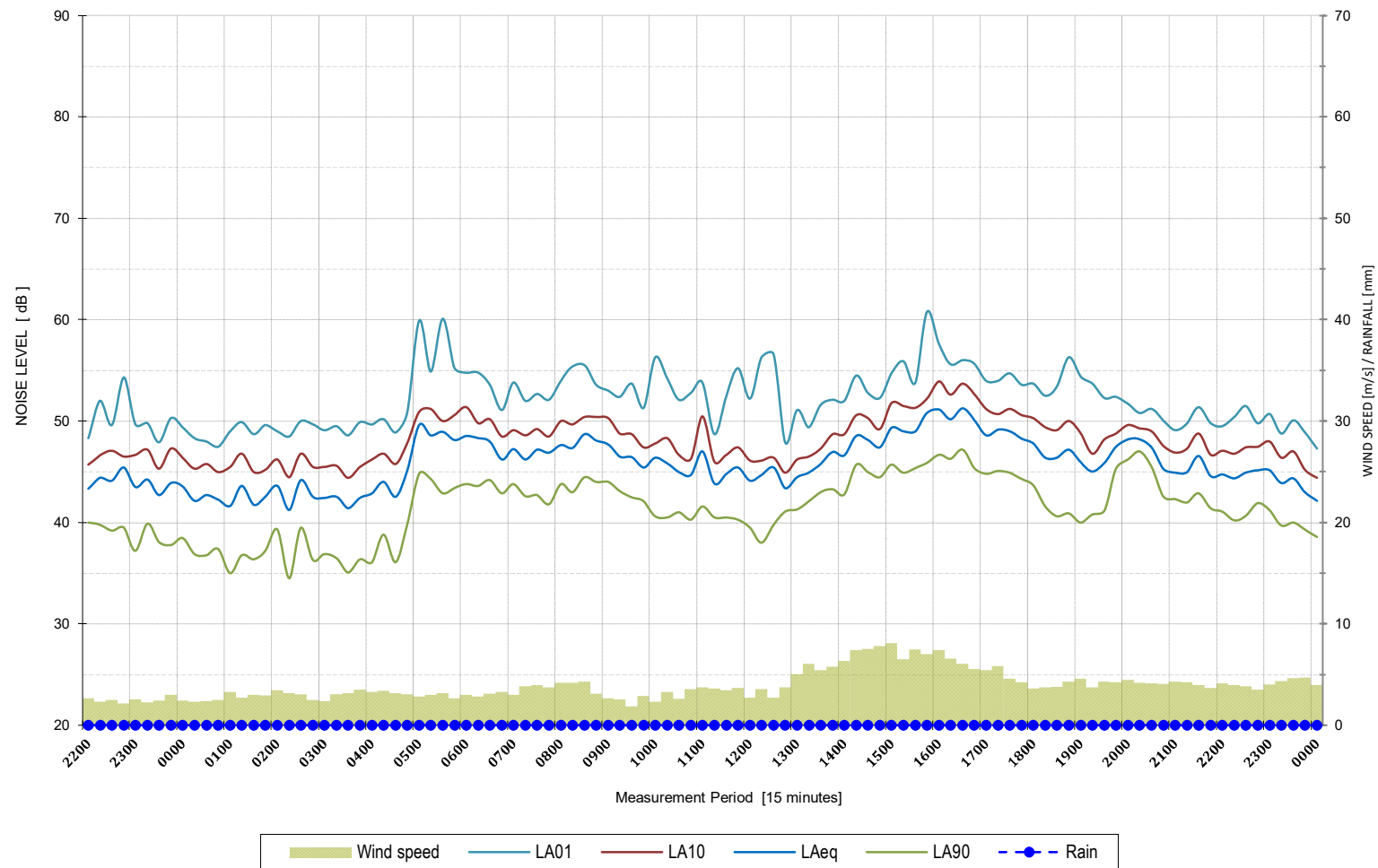




DAY 6

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

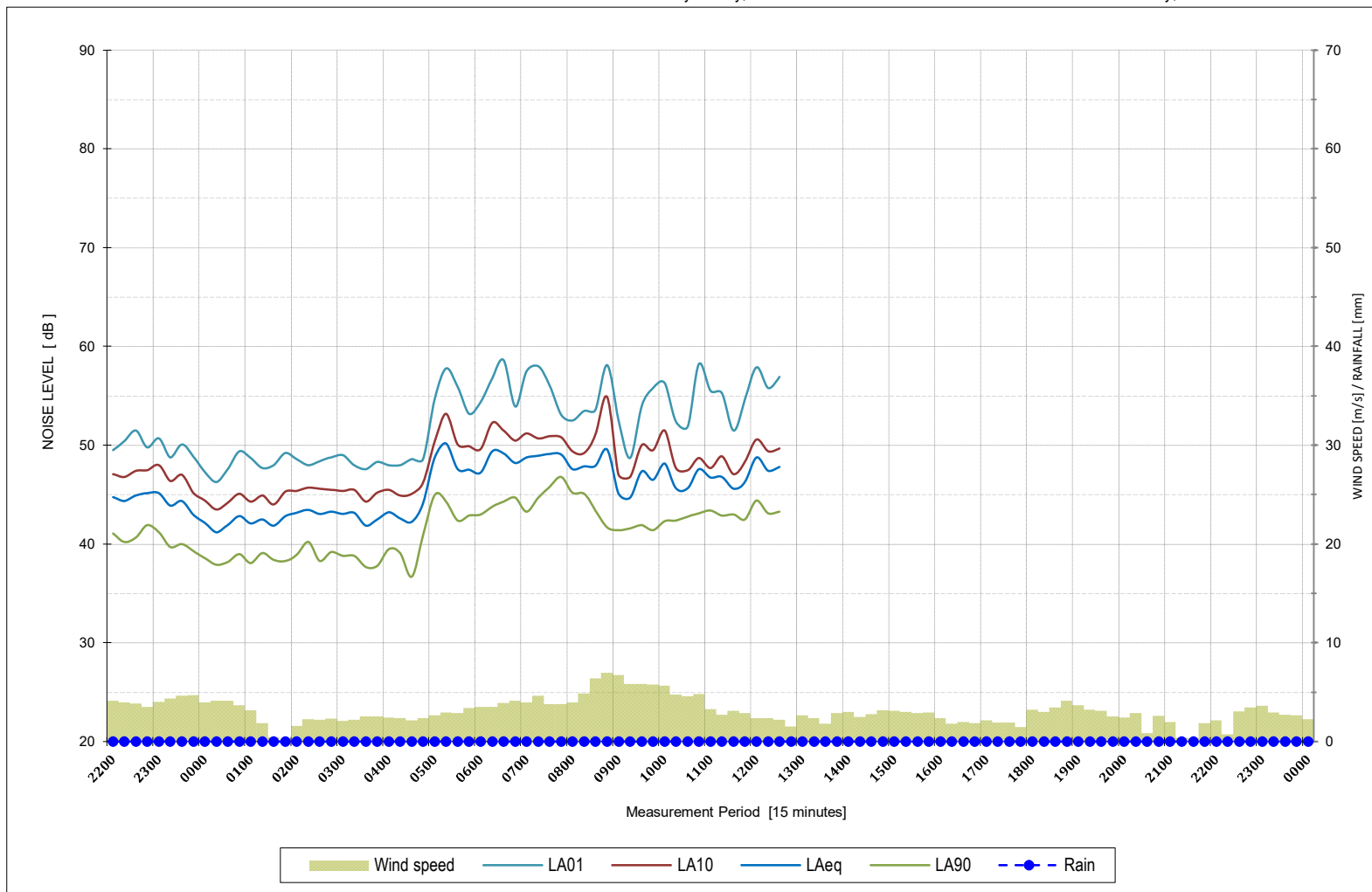
DATE: Thursday, 18 November 2021



DAY 7

LOGGER LOCATION: R1: 196 Myall Way, Tea Gardens

DATE: Friday, 19 November 2021

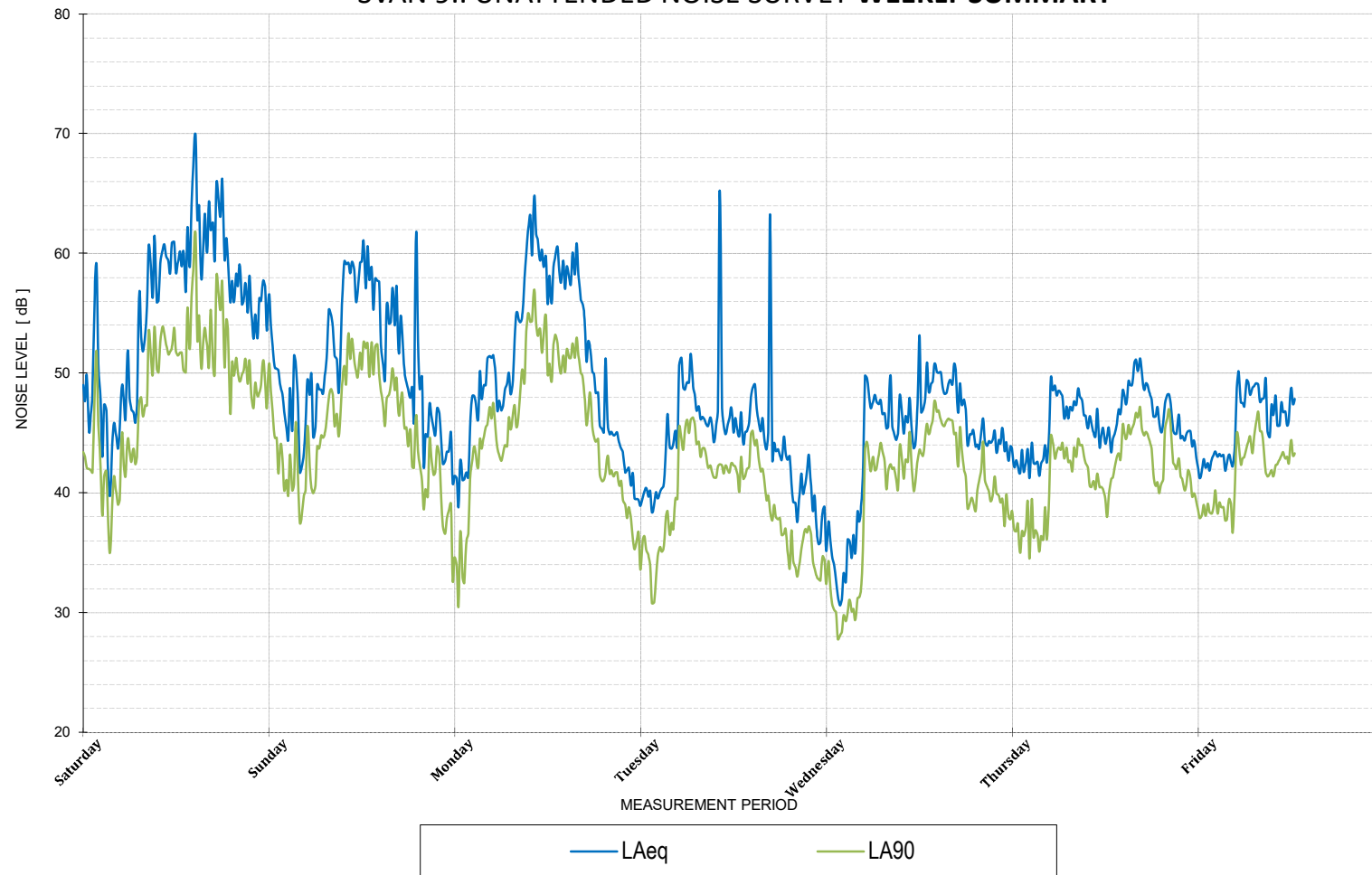


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R1: 196 Myall Way, Tea Gardens

**PERIOD:** 13th to the 19th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

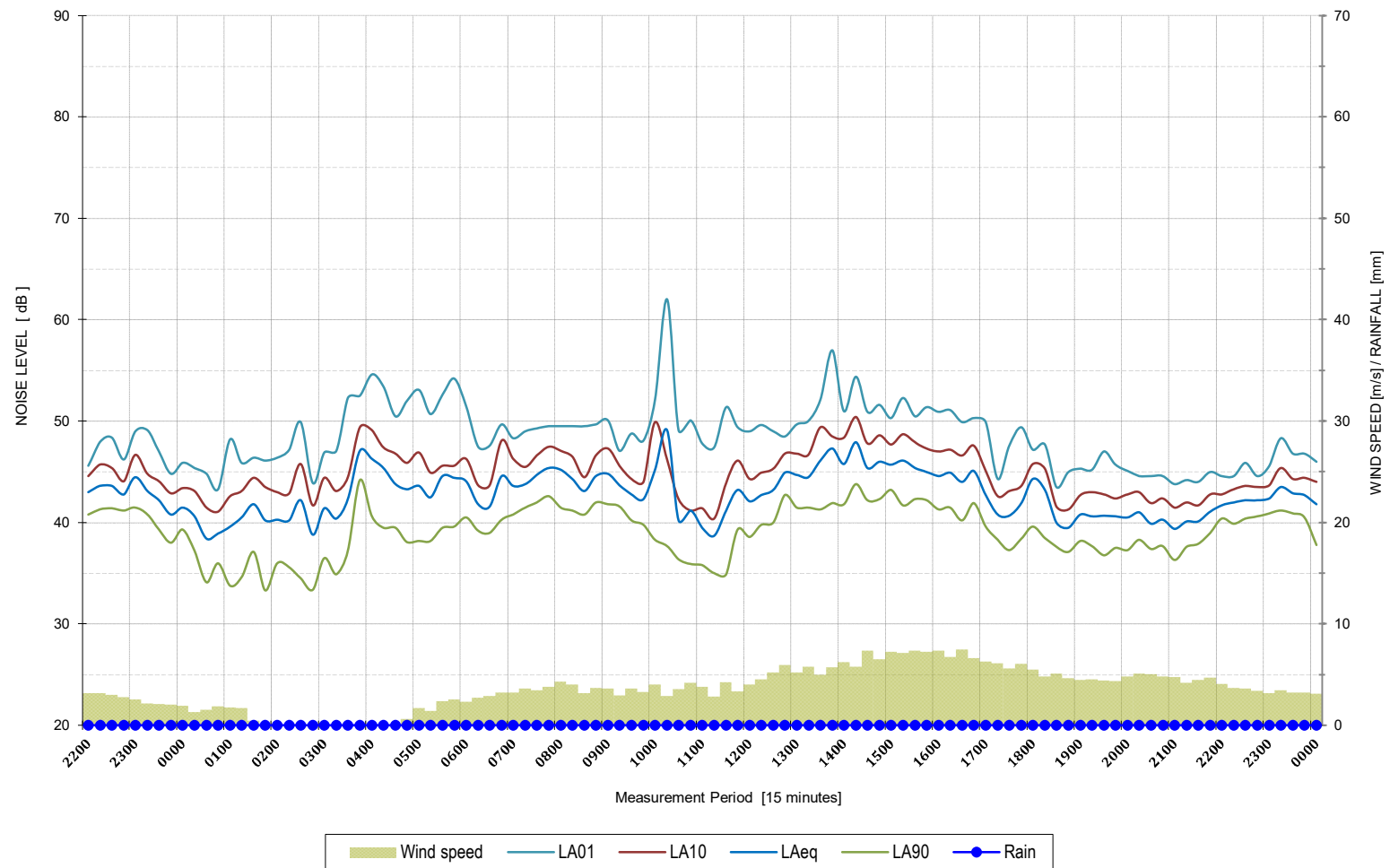


*Sundays and Public Holidays the hours change to 0800*

DAY 1

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

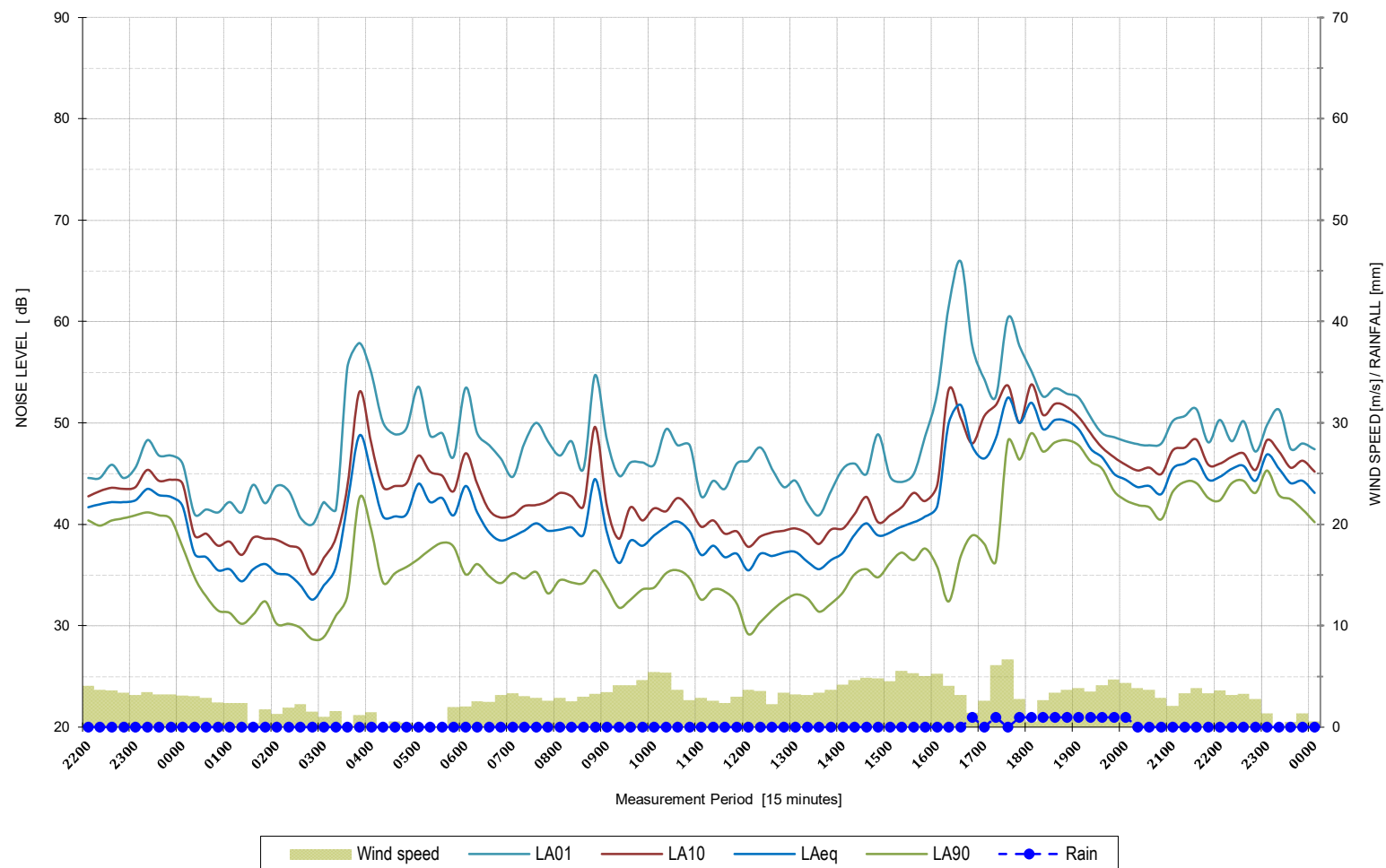
DATE: Saturday, 6 November 2021



DAY 2

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

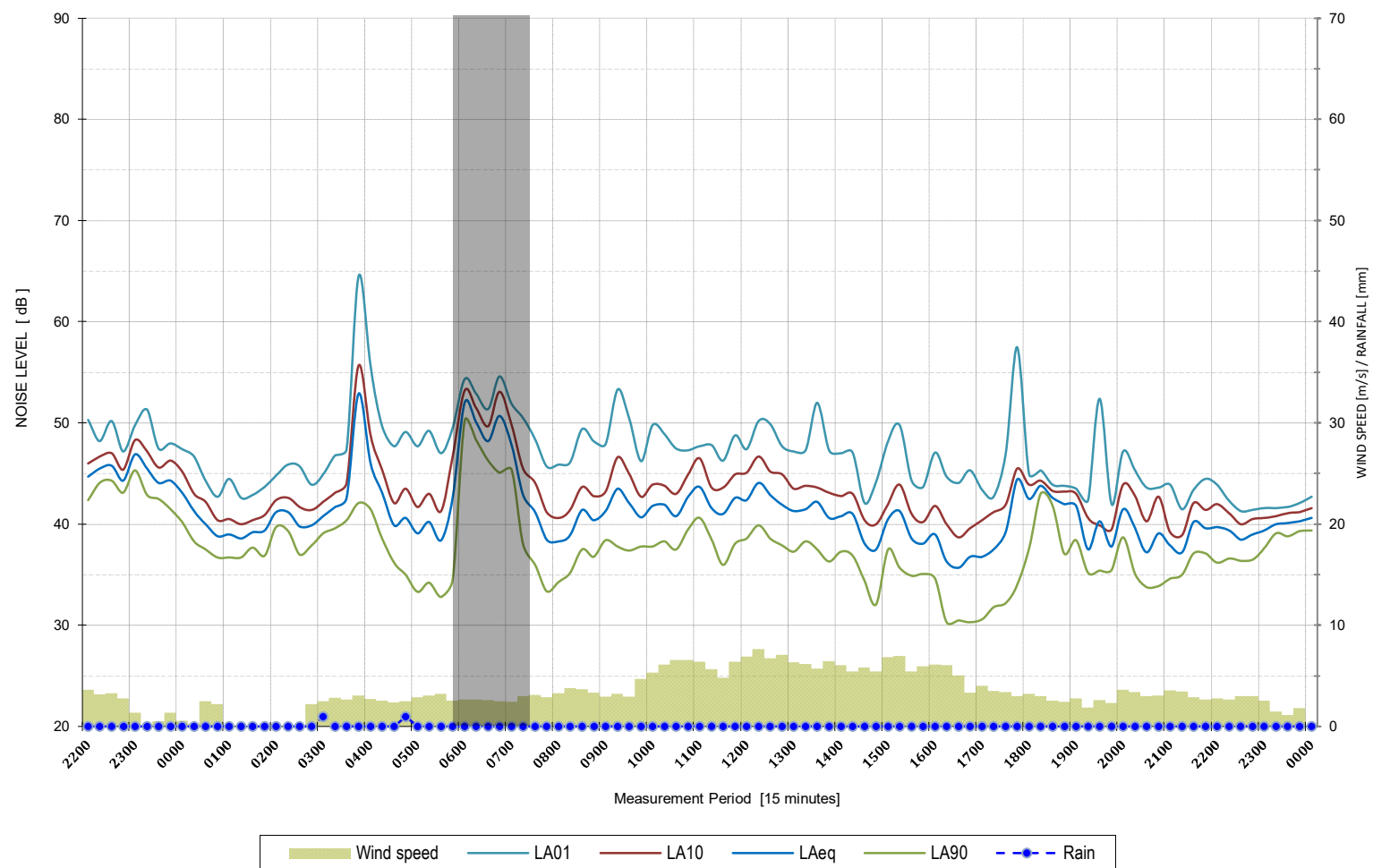
DATE: Sunday, 7 November 2021



DAY 3

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

DATE: Monday, 8 November 2021

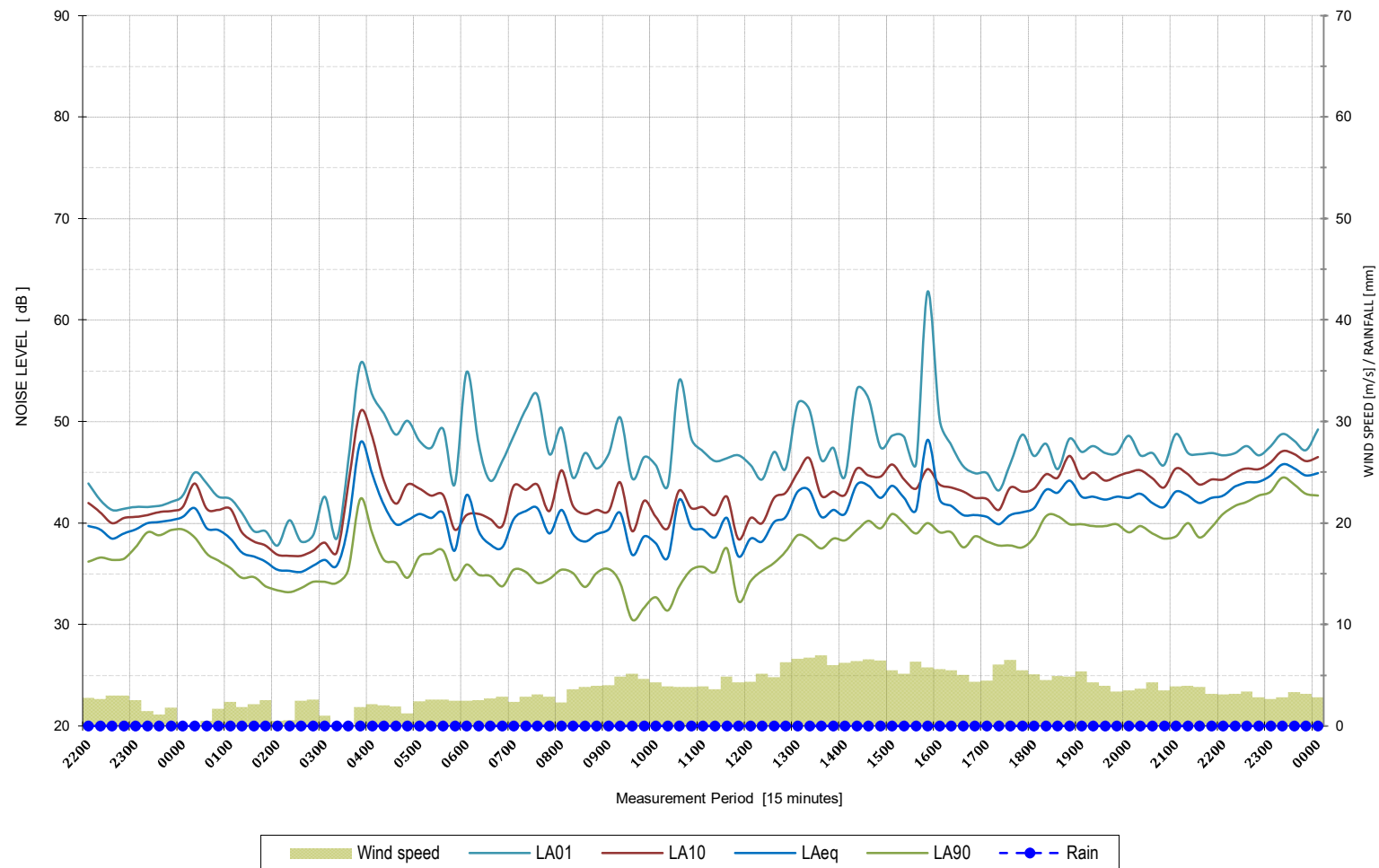




DAY 4

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

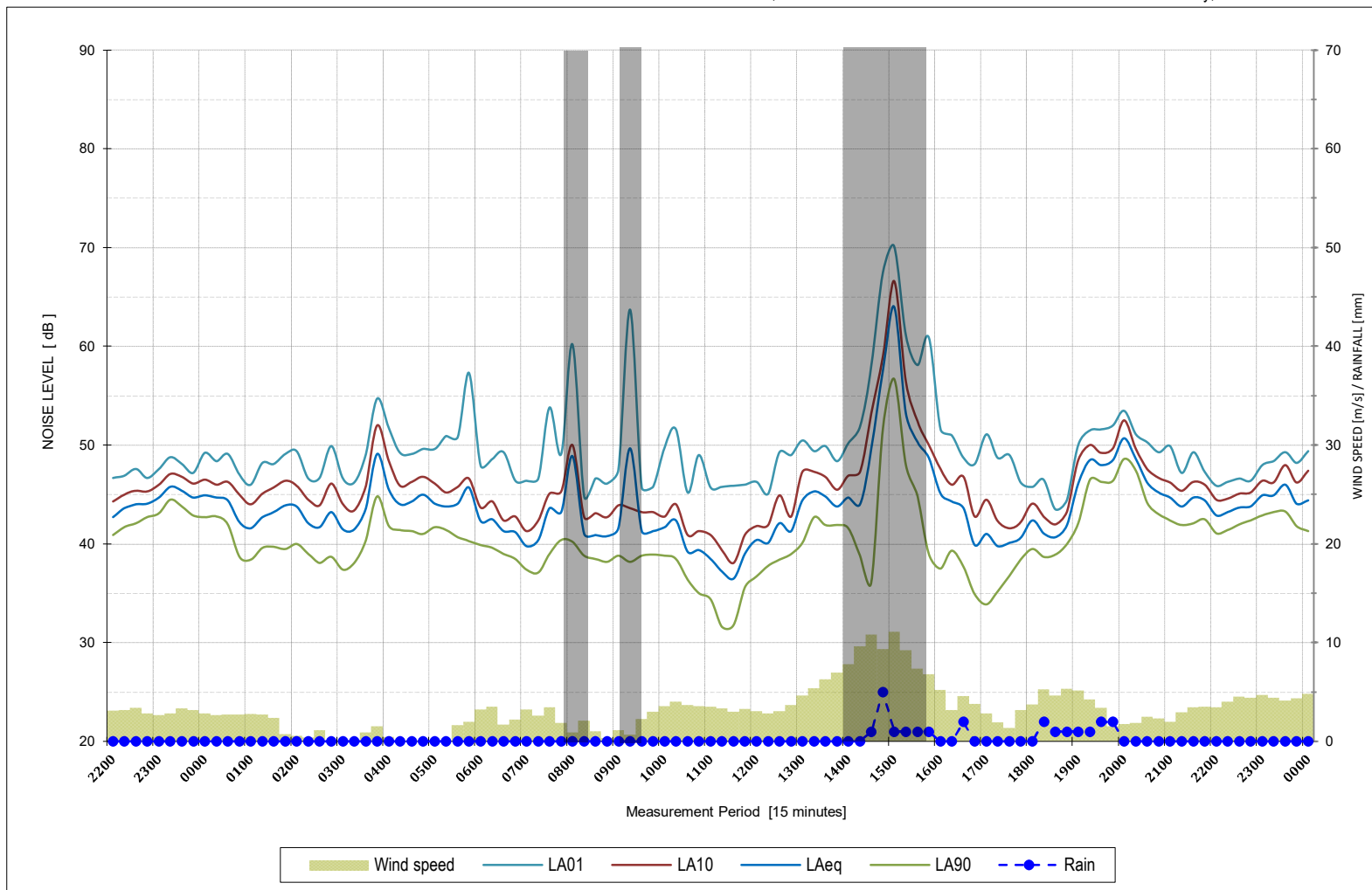
DATE: Tuesday, 9 November 2021



DAY 5

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

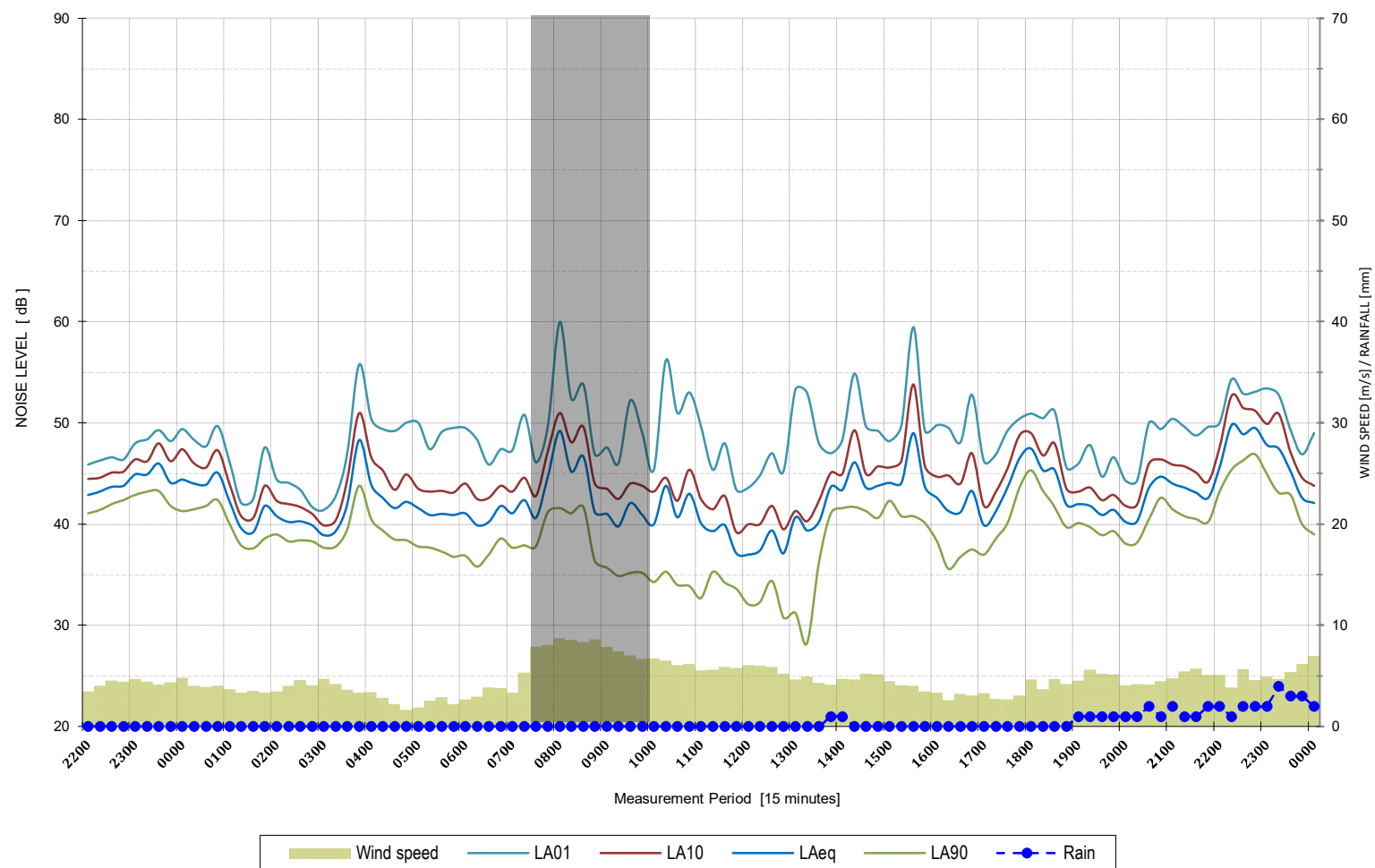
DATE: Wednesday, 10 November 2021



DAY 6

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

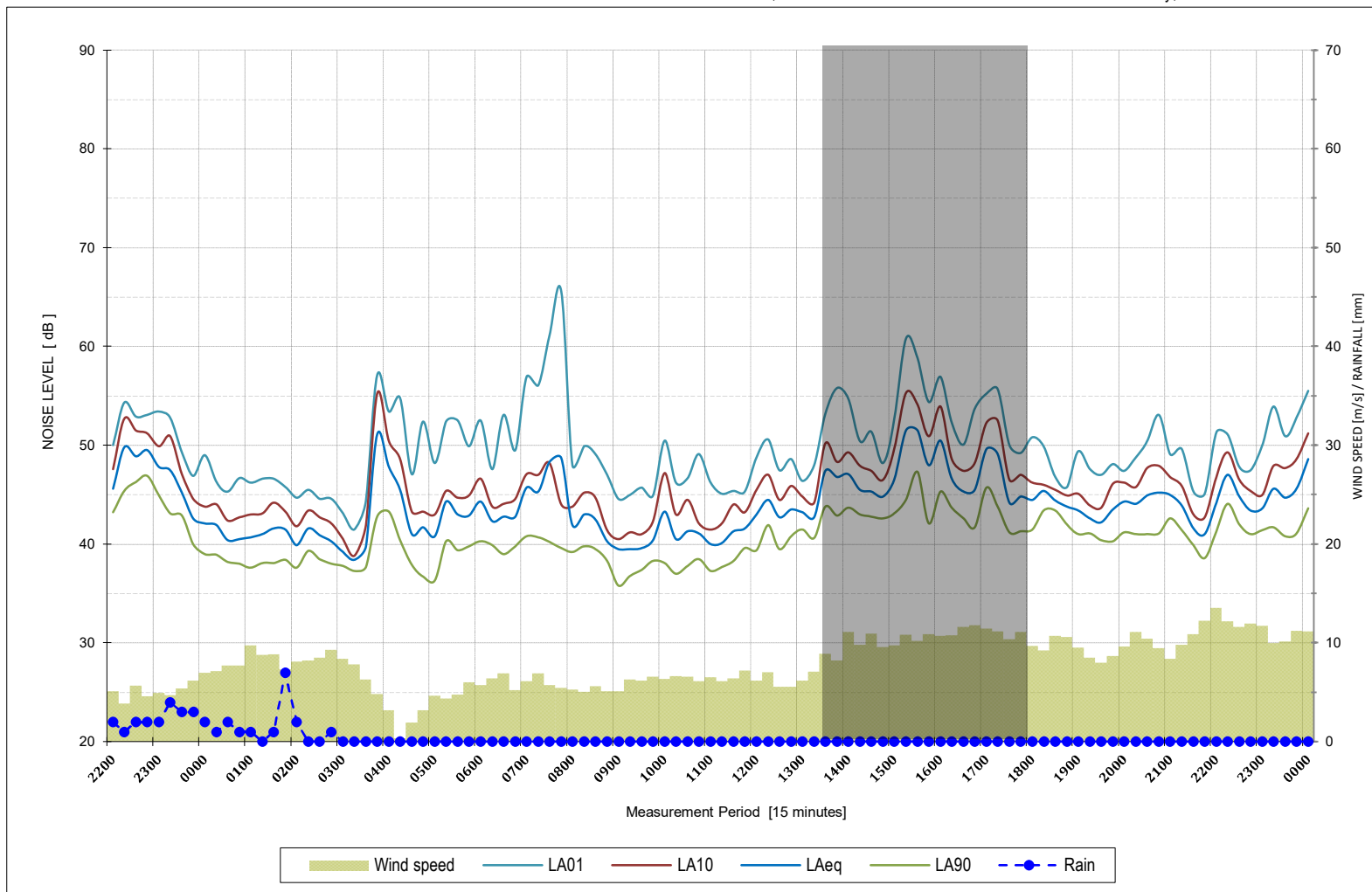
DATE: Thursday, 11 November 2021



DAY 7

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

DATE: Friday, 12 November 2021

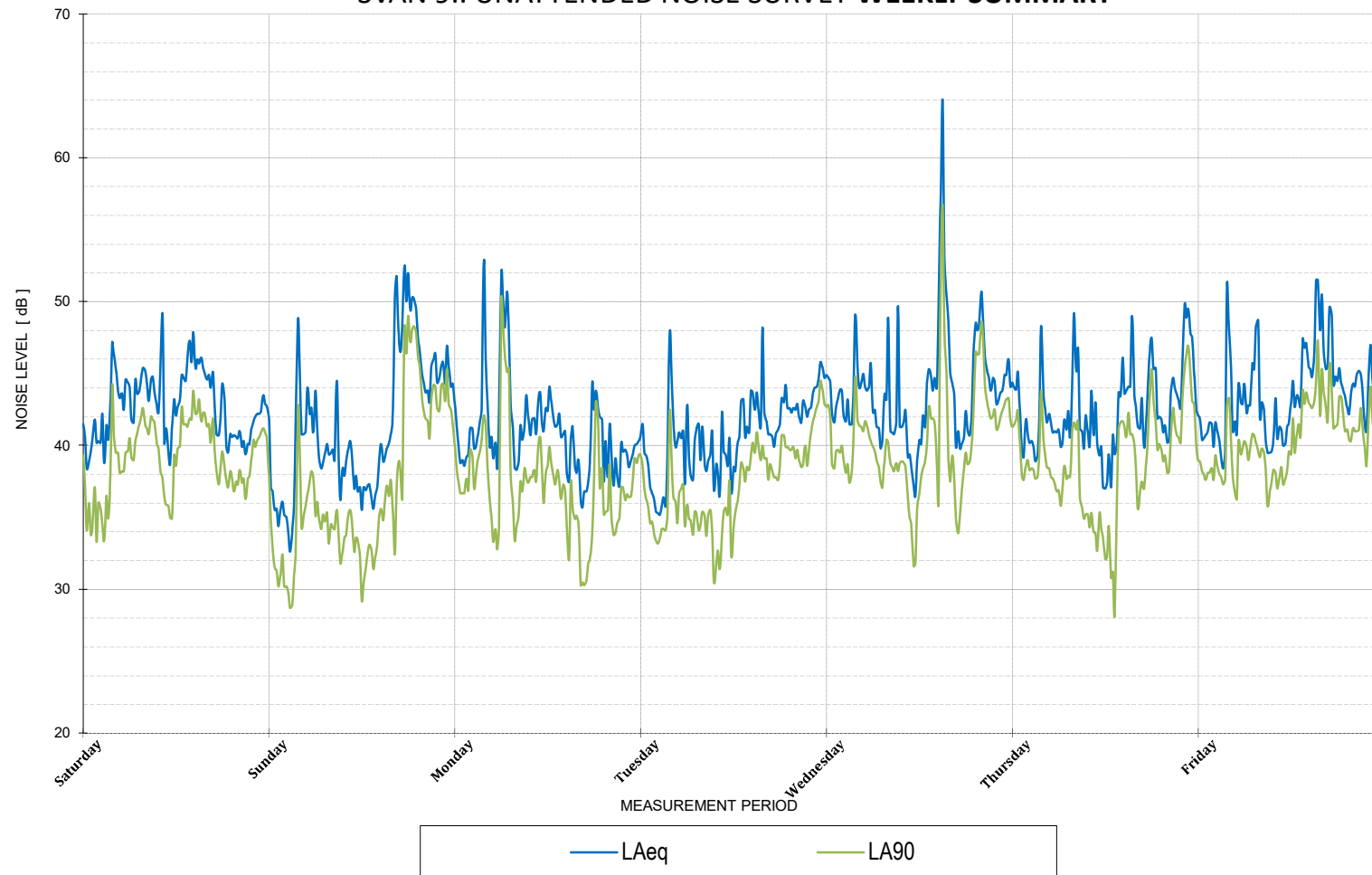


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R2: 124 Pindimar Road, Tea Gardens

**PERIOD:** 6th to the 11th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

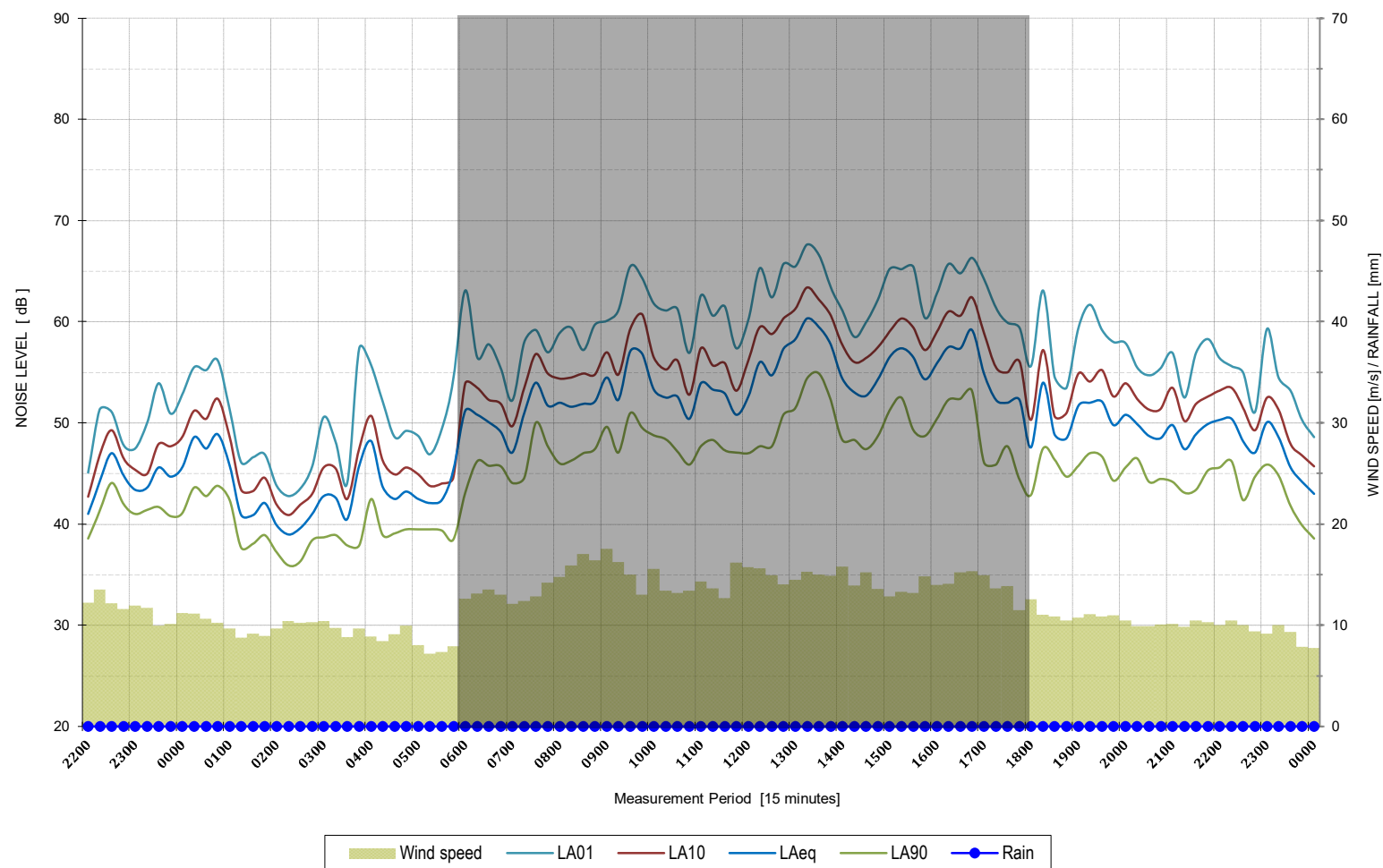


*Sundays and Public Holidays the hours change to 0800*

DAY 1

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

DATE: Saturday, 13 November 2021

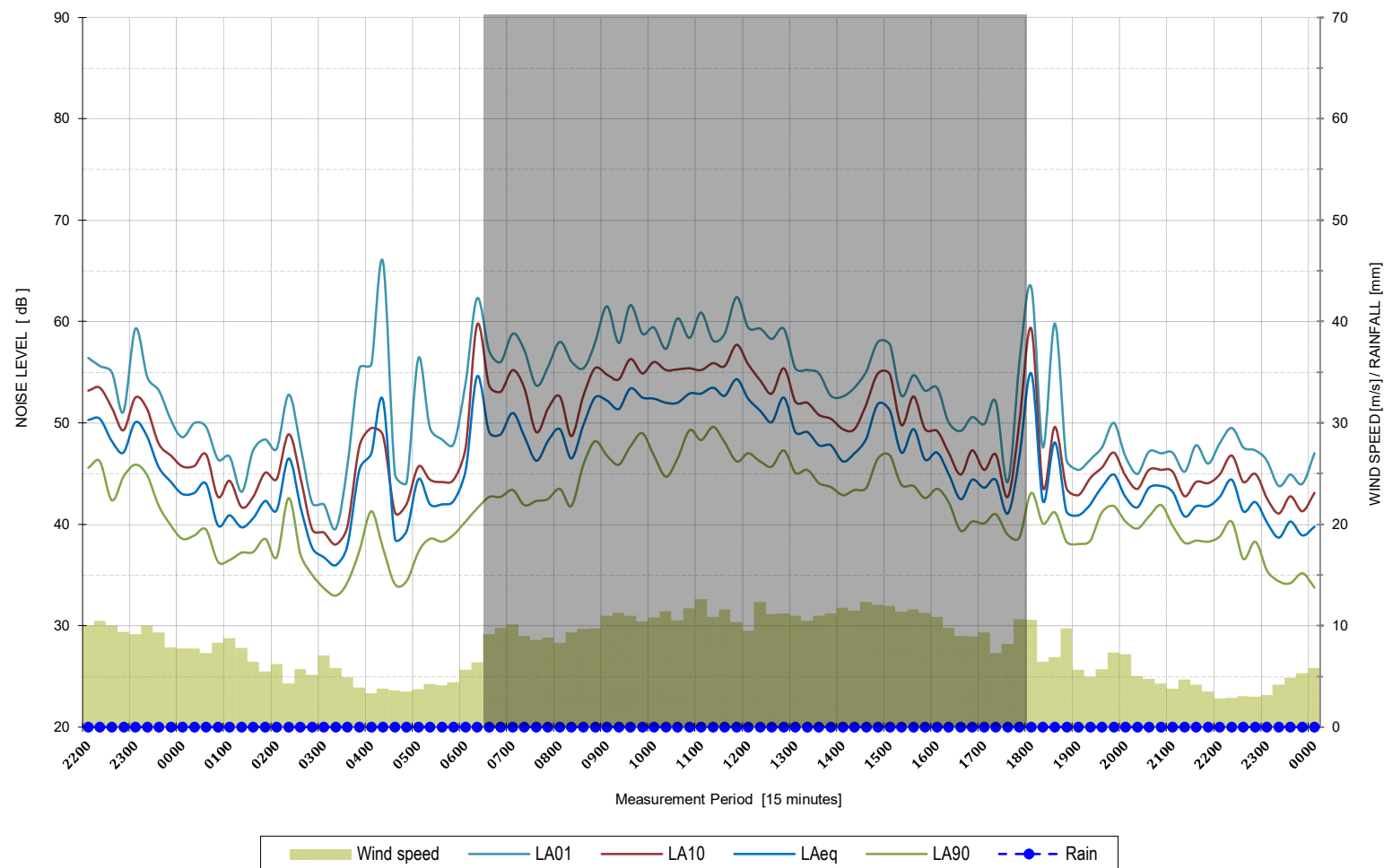




DAY 2

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

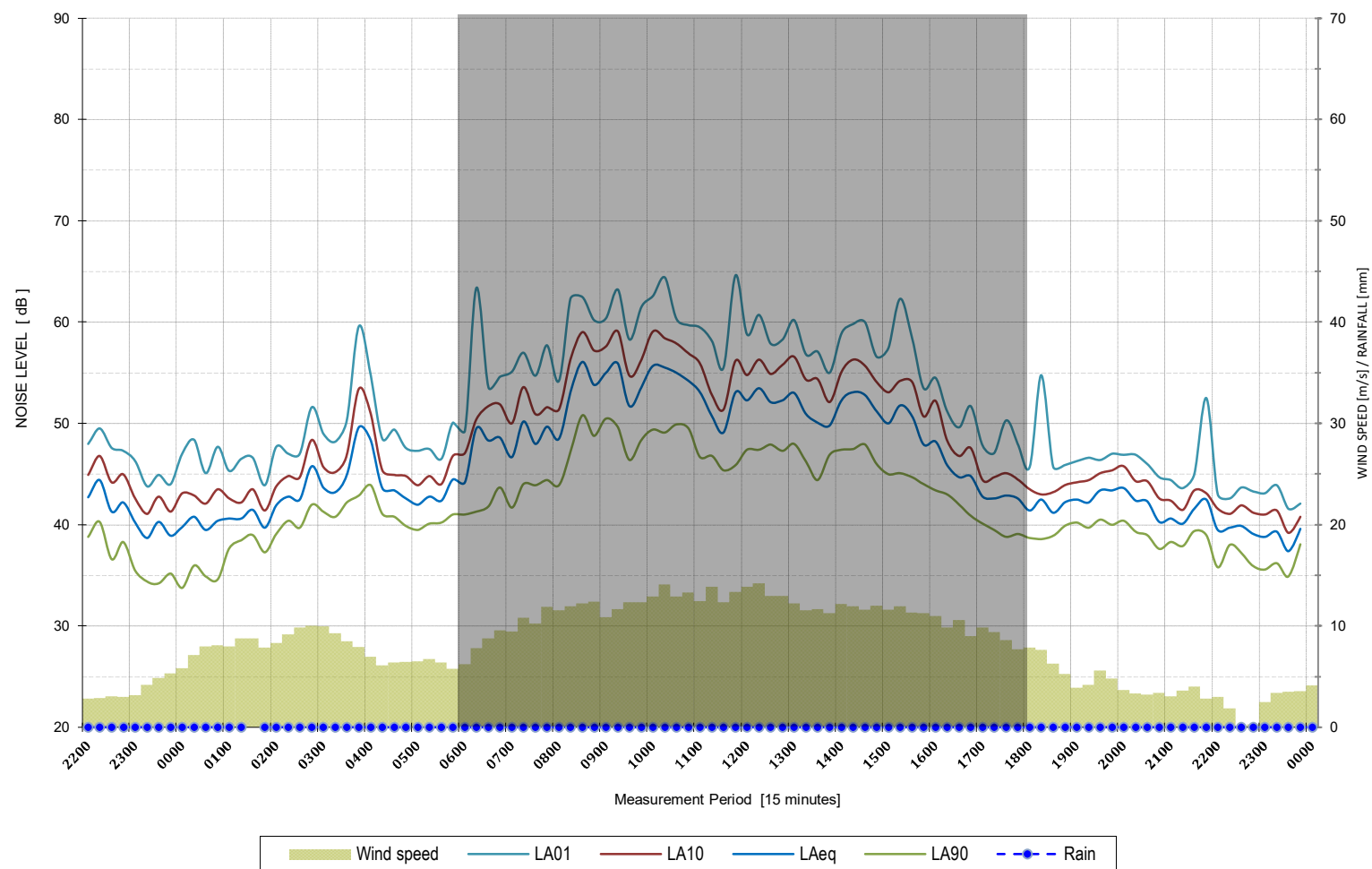
DATE: Sunday, 14 November 2021



DAY 3

LOGGER LOCATION: R2: 124 Pindimar Road, Tea Gardens

DATE: Monday, 15 November 2021

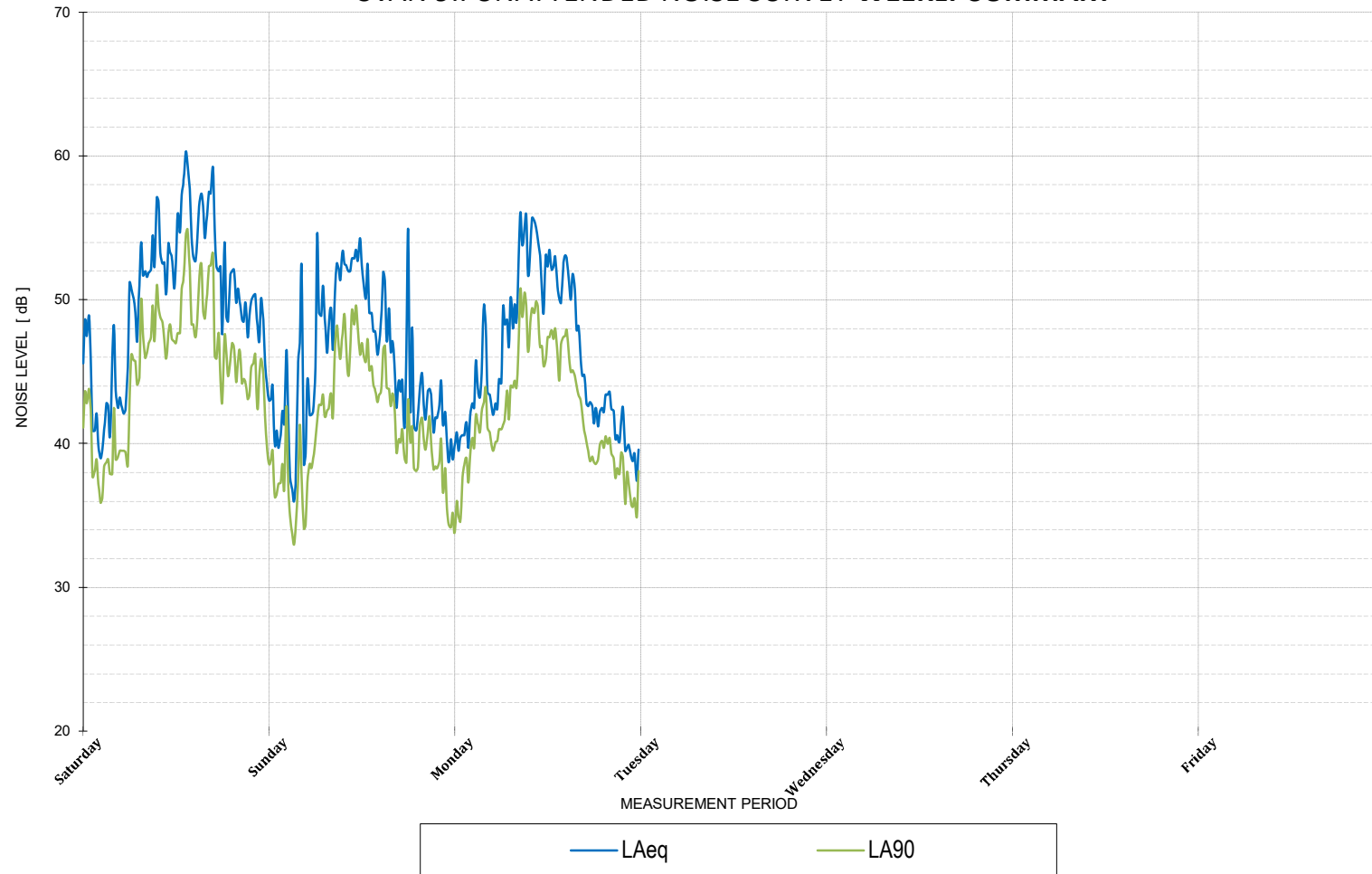


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R2: 124 Pindimar Road, Tea Gardens

**PERIOD:** 13th to the 19th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

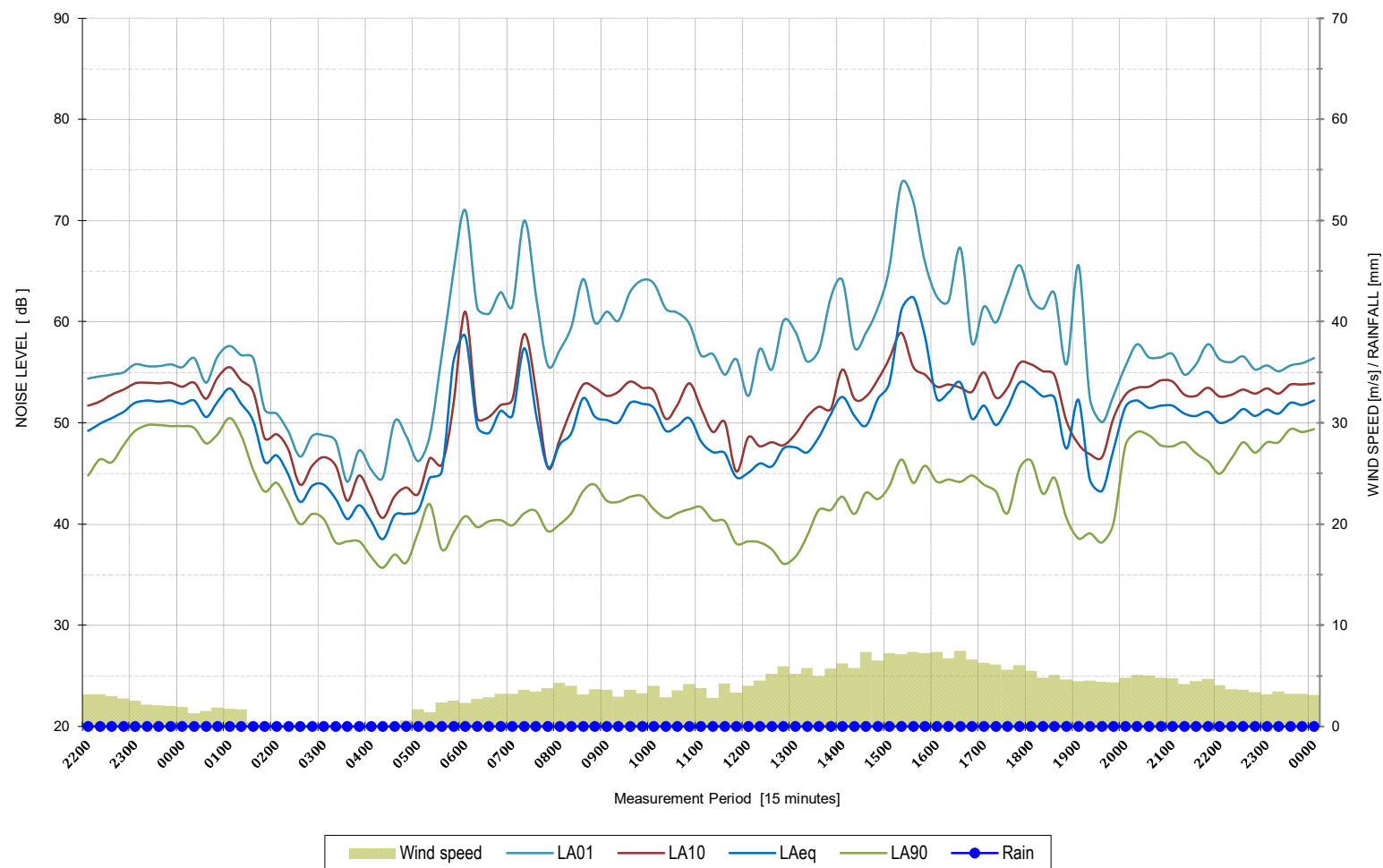


Sundays and Public Holidays the hours change to 0800

DAY 1

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

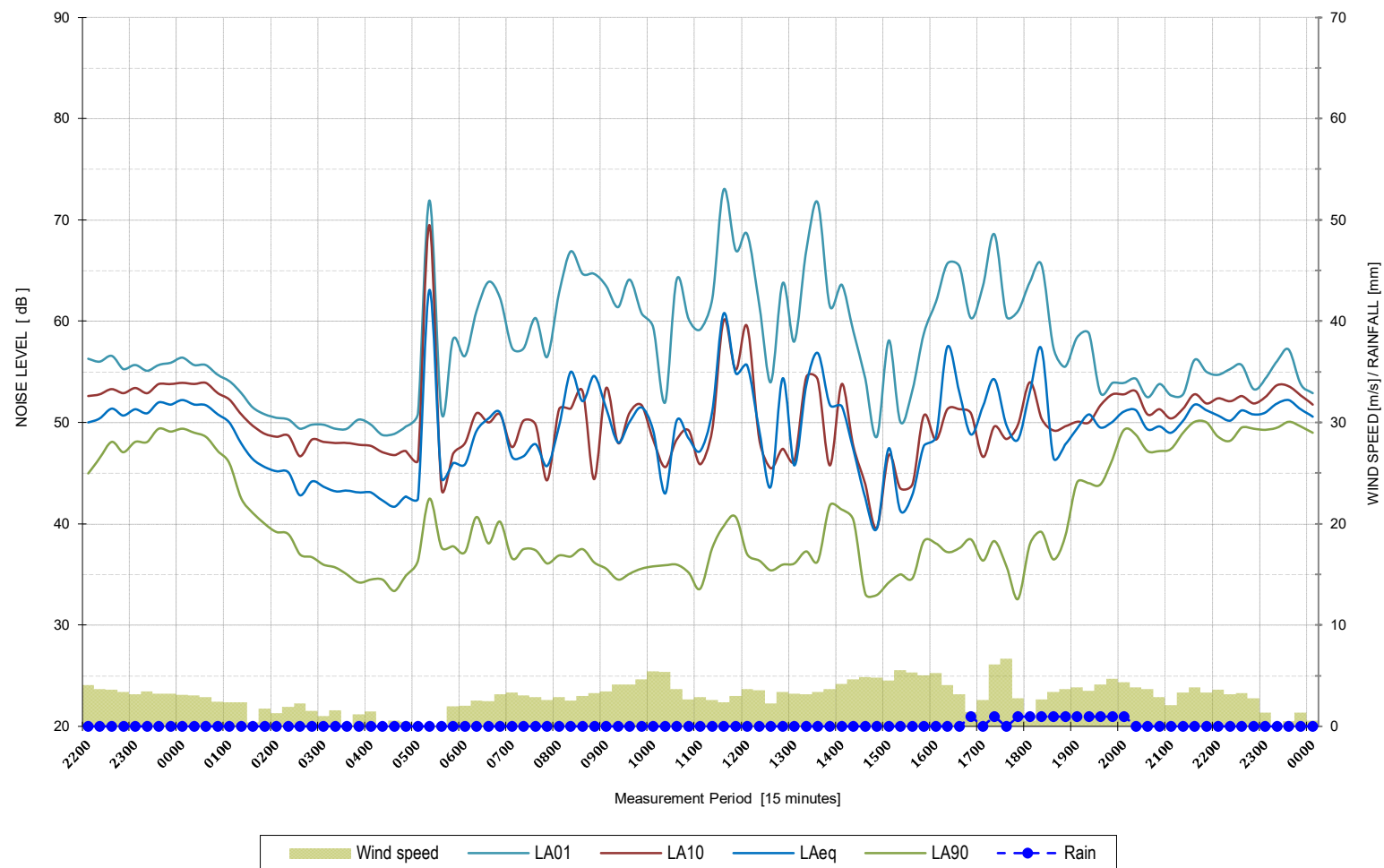
DATE: Saturday, 6 November 2021



DAY 2

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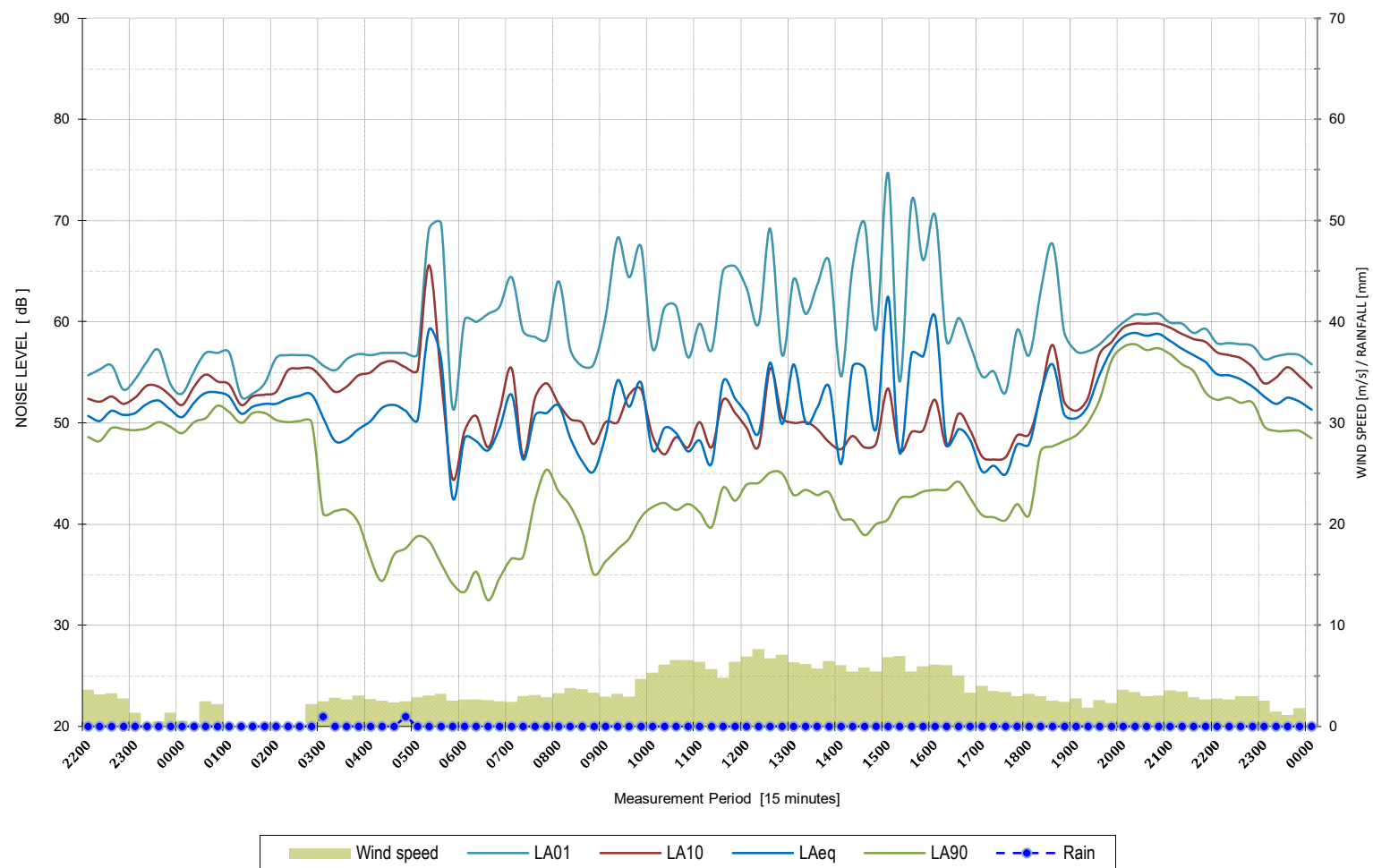
DATE: Sunday, 7 November 2021



DAY 3

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

DATE: Monday, 8 November 2021

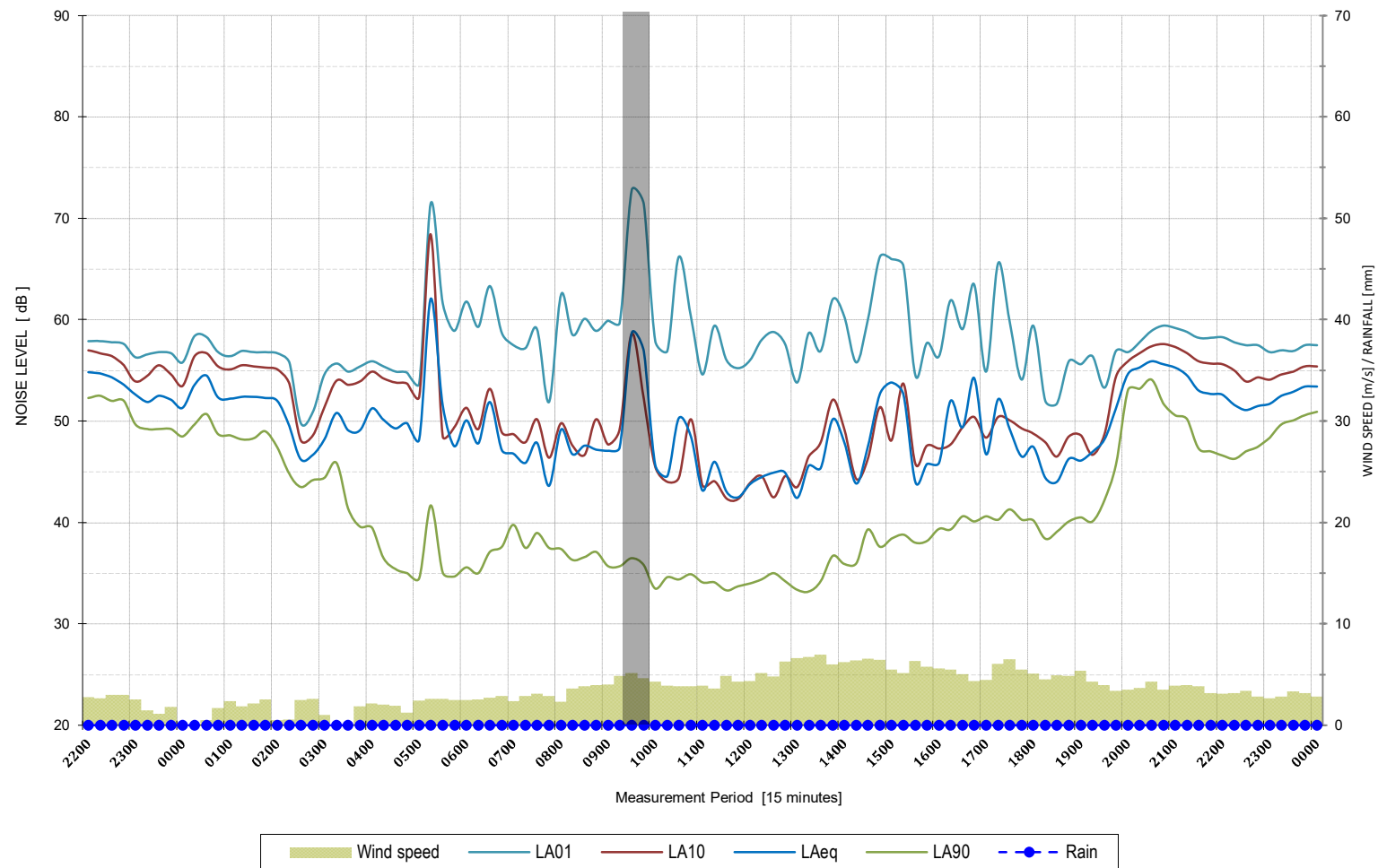




DAY 4

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

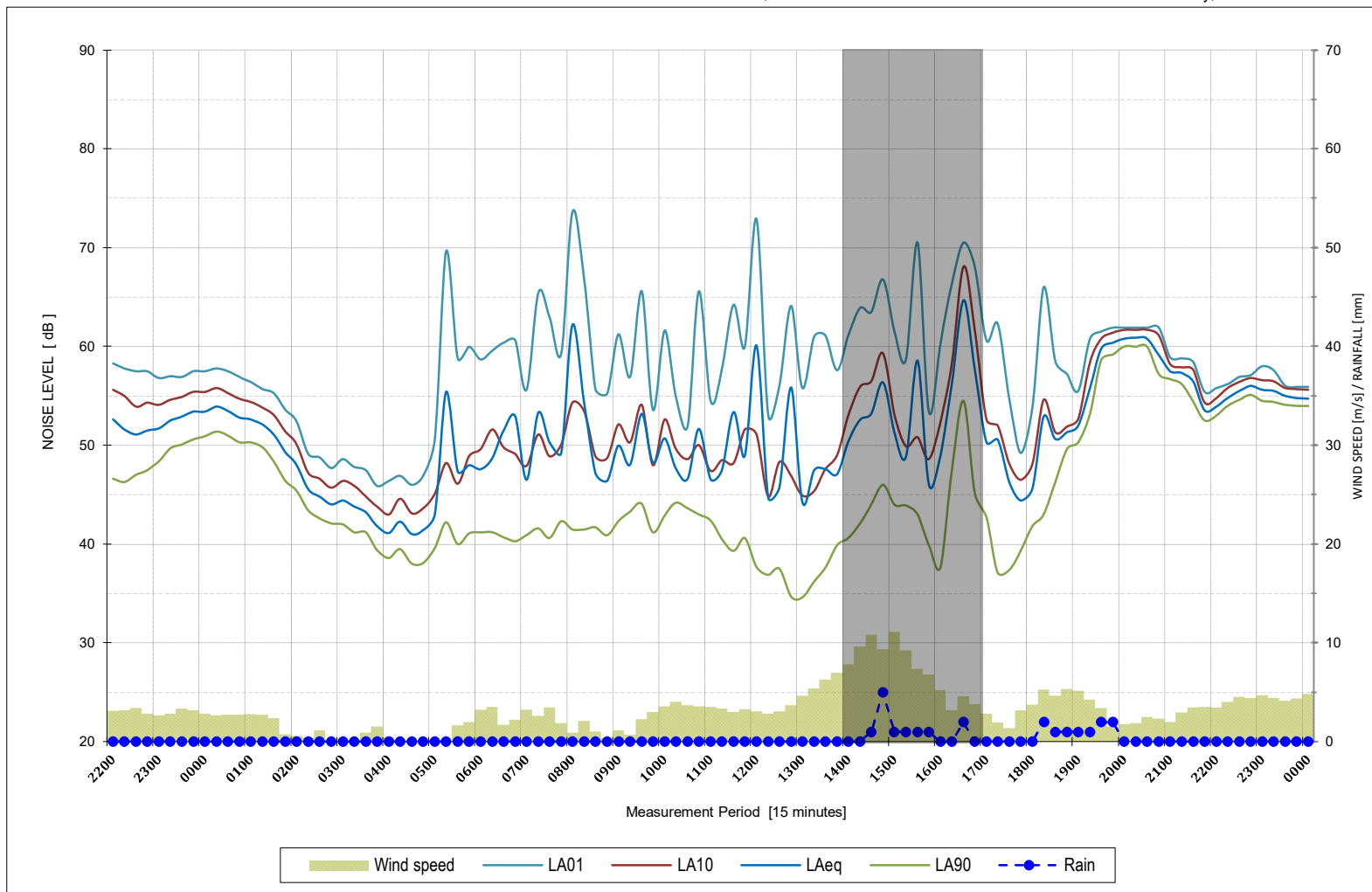
DATE: Tuesday, 9 November 2021



DAY 5

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

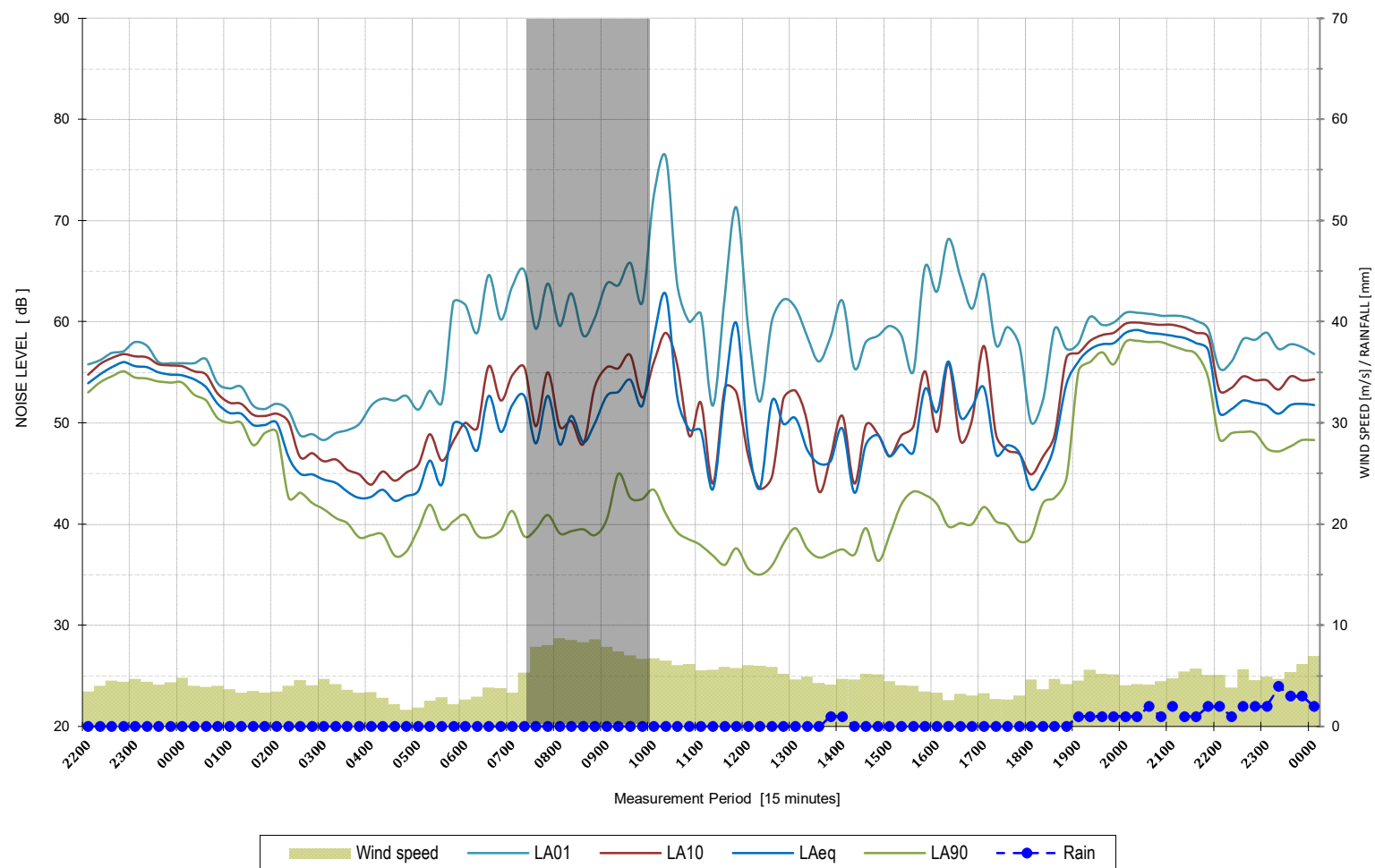
DATE: Wednesday, 10 November 2021



DAY 6

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

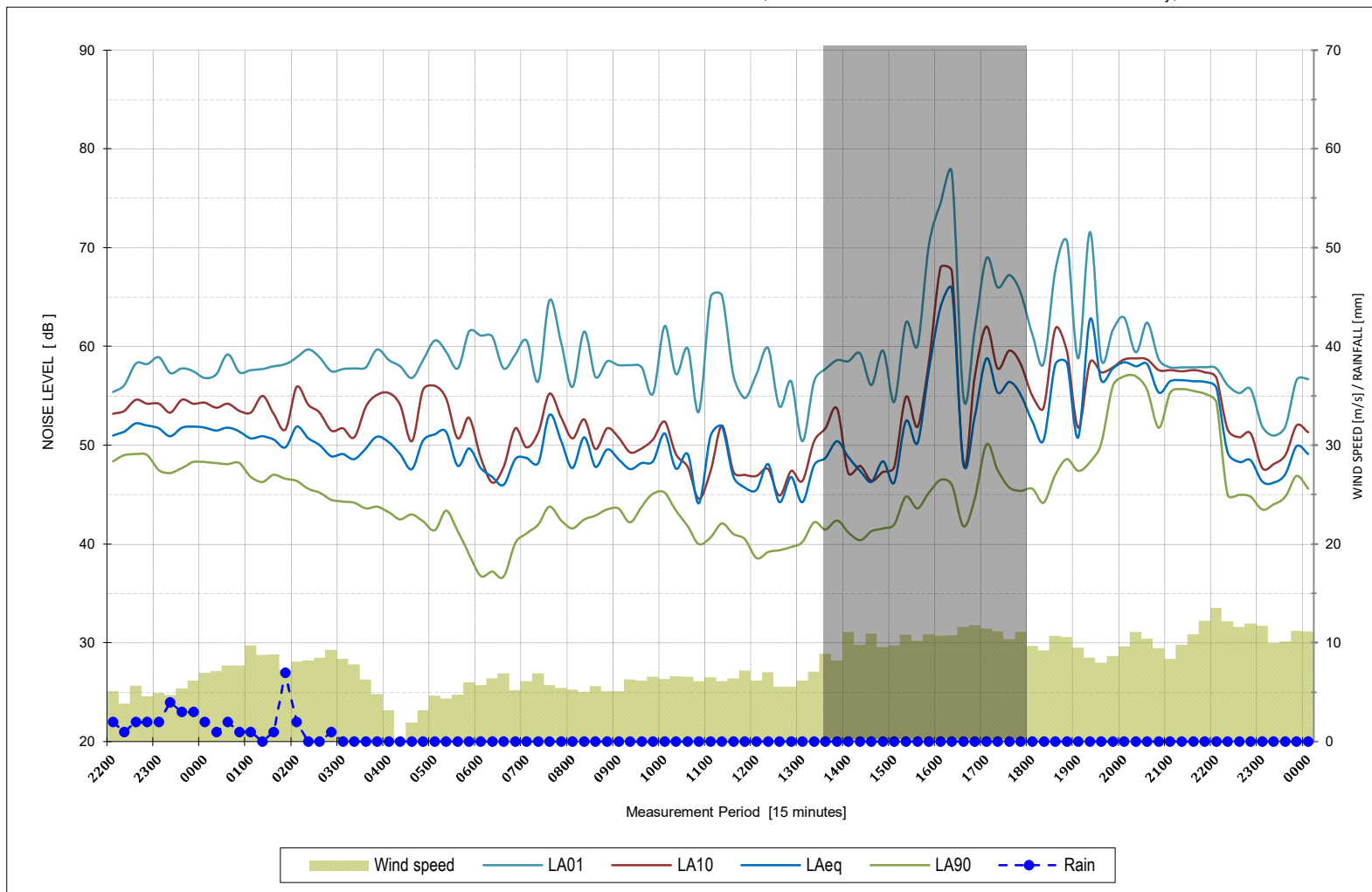
DATE: Thursday, 11 November 2021



DAY 7

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

DATE: Friday, 12 November 2021

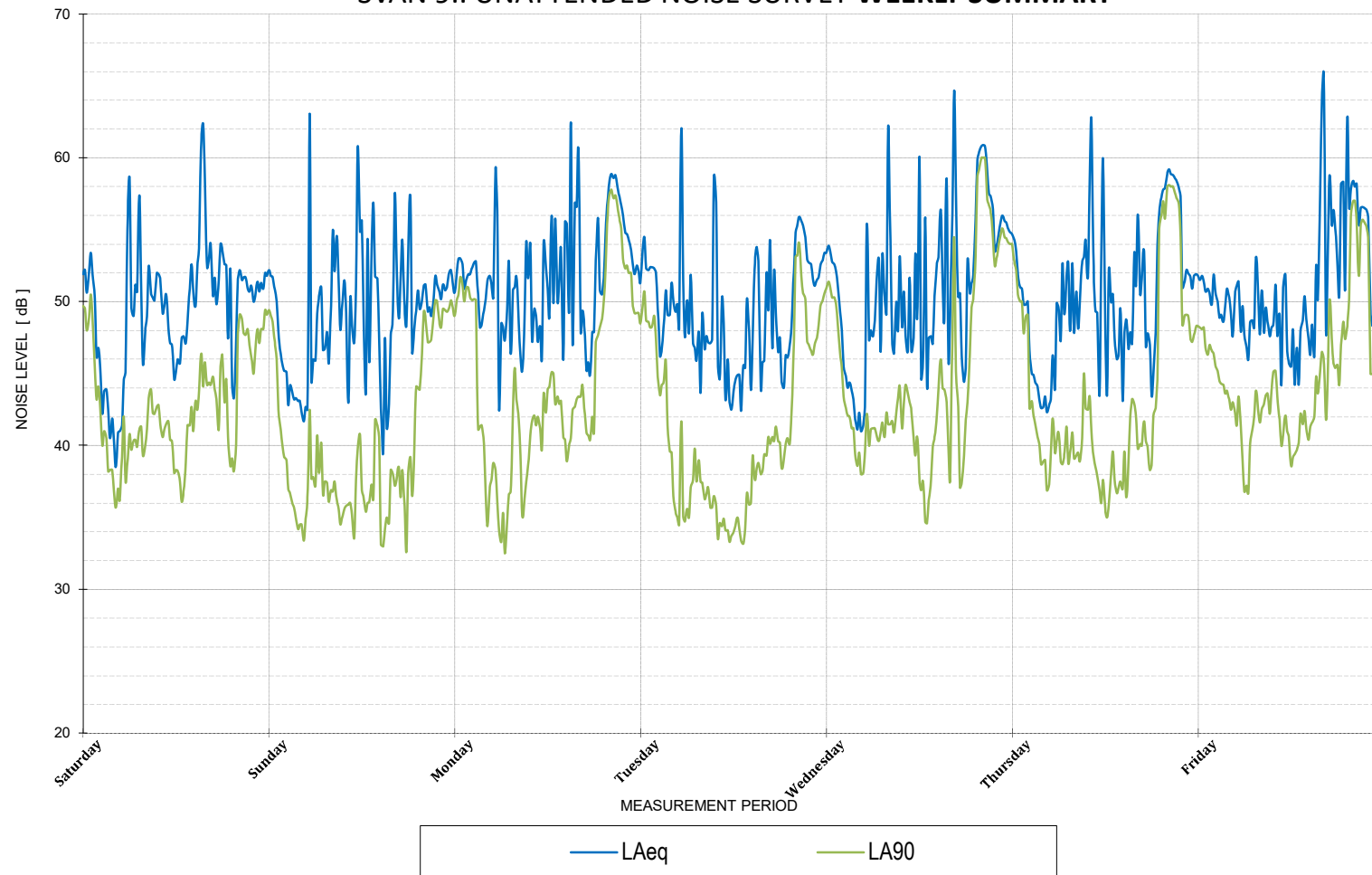


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R3: 87 Pindimar Road, Tea Gardens

**PERIOD:** 6th to the 11th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

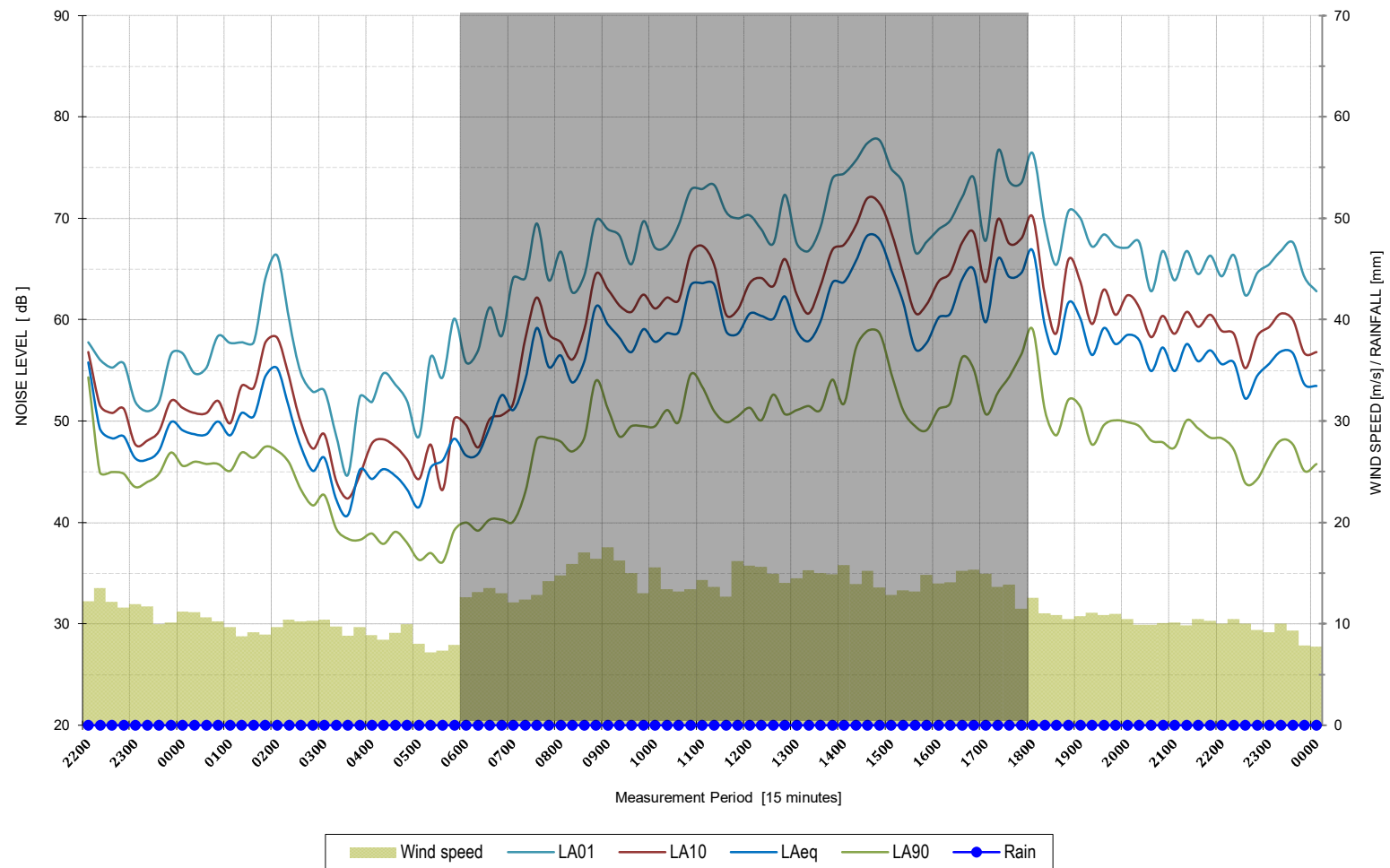


*Sundays and Public Holidays the hours change to 0800*

DAY 1

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

DATE: Saturday, 13 November 2021

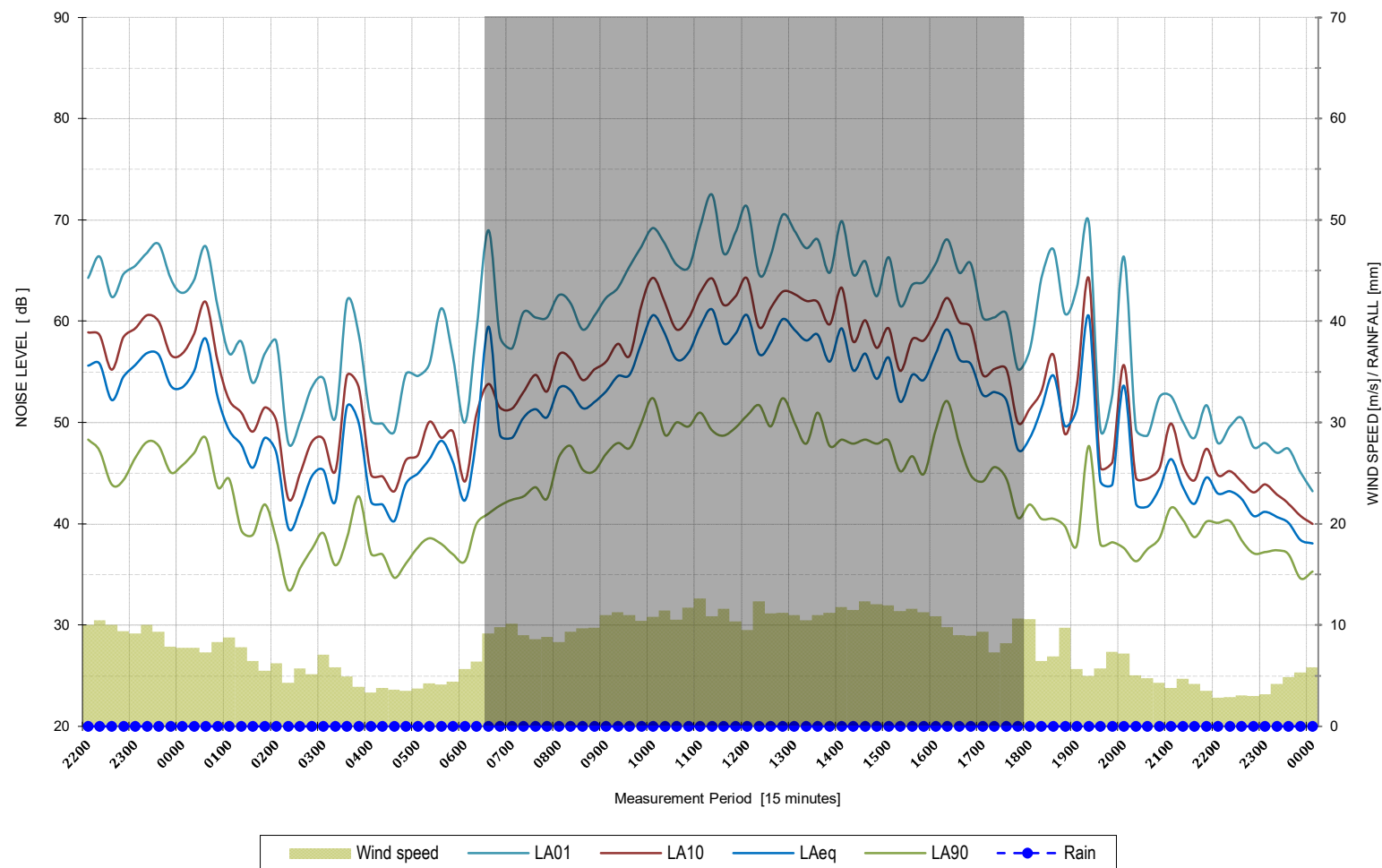




DAY 2

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

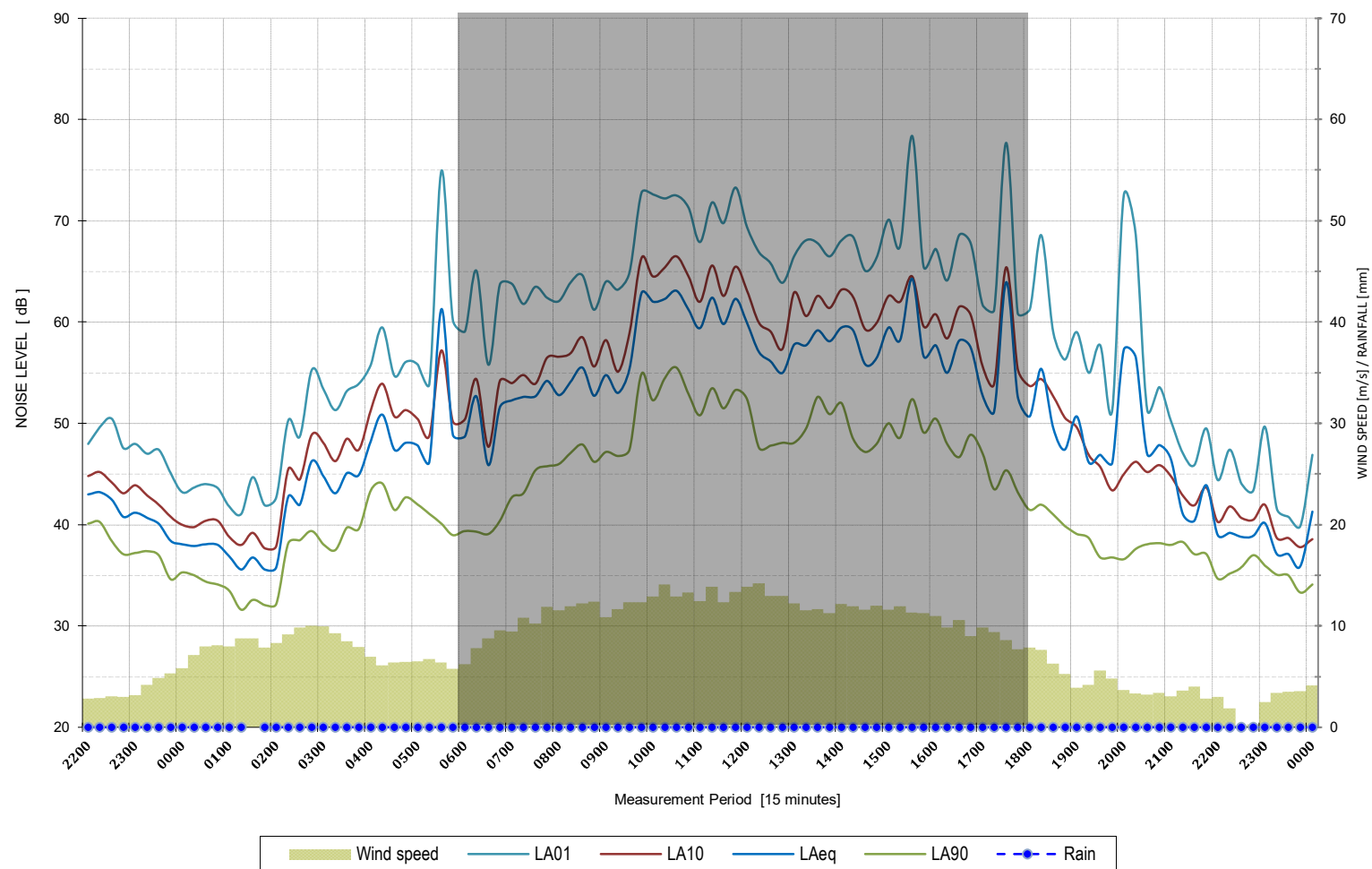
DATE: Sunday, 14 November 2021



DAY 3

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

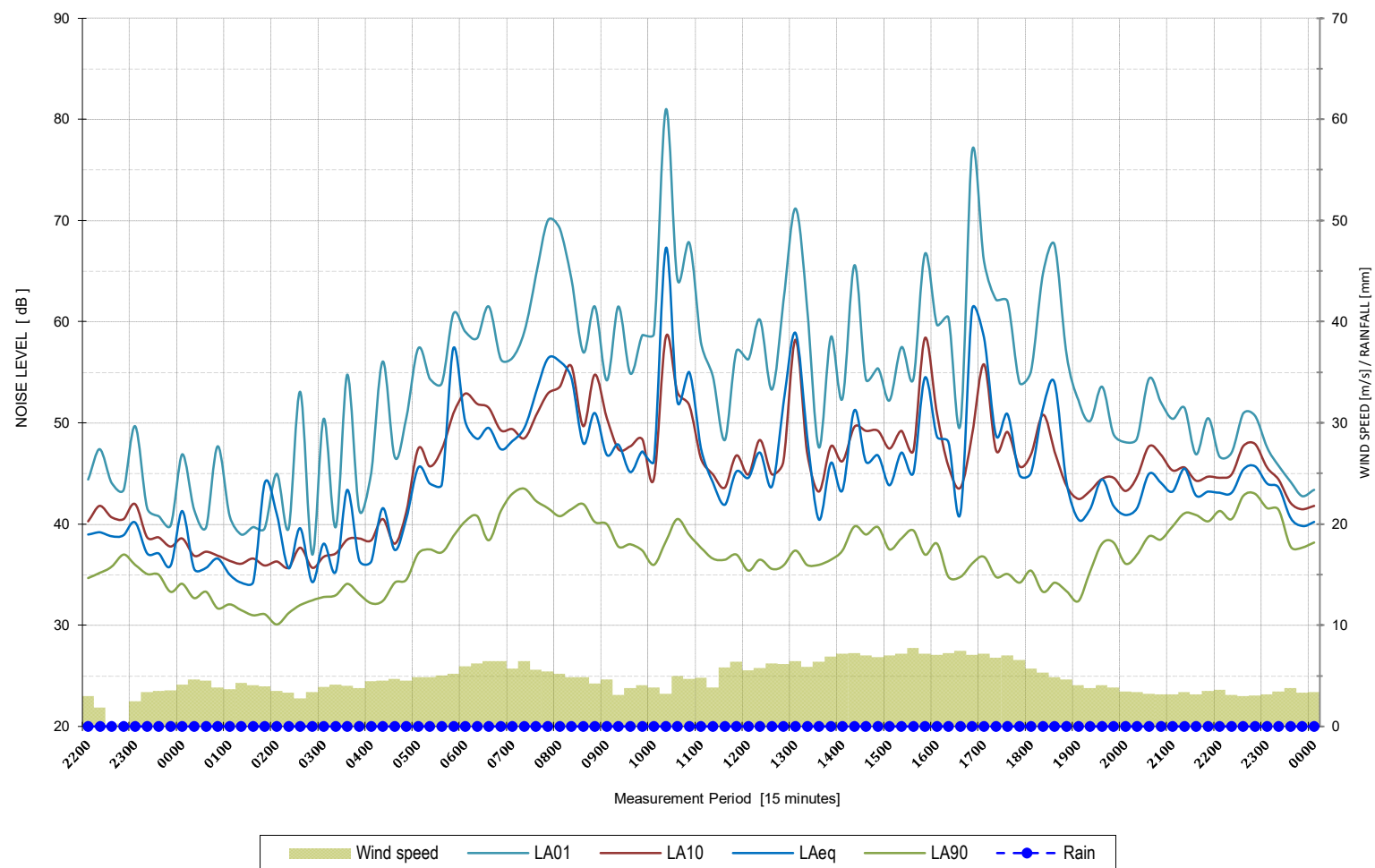
DATE: Monday, 15 November 2021



DAY 4

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

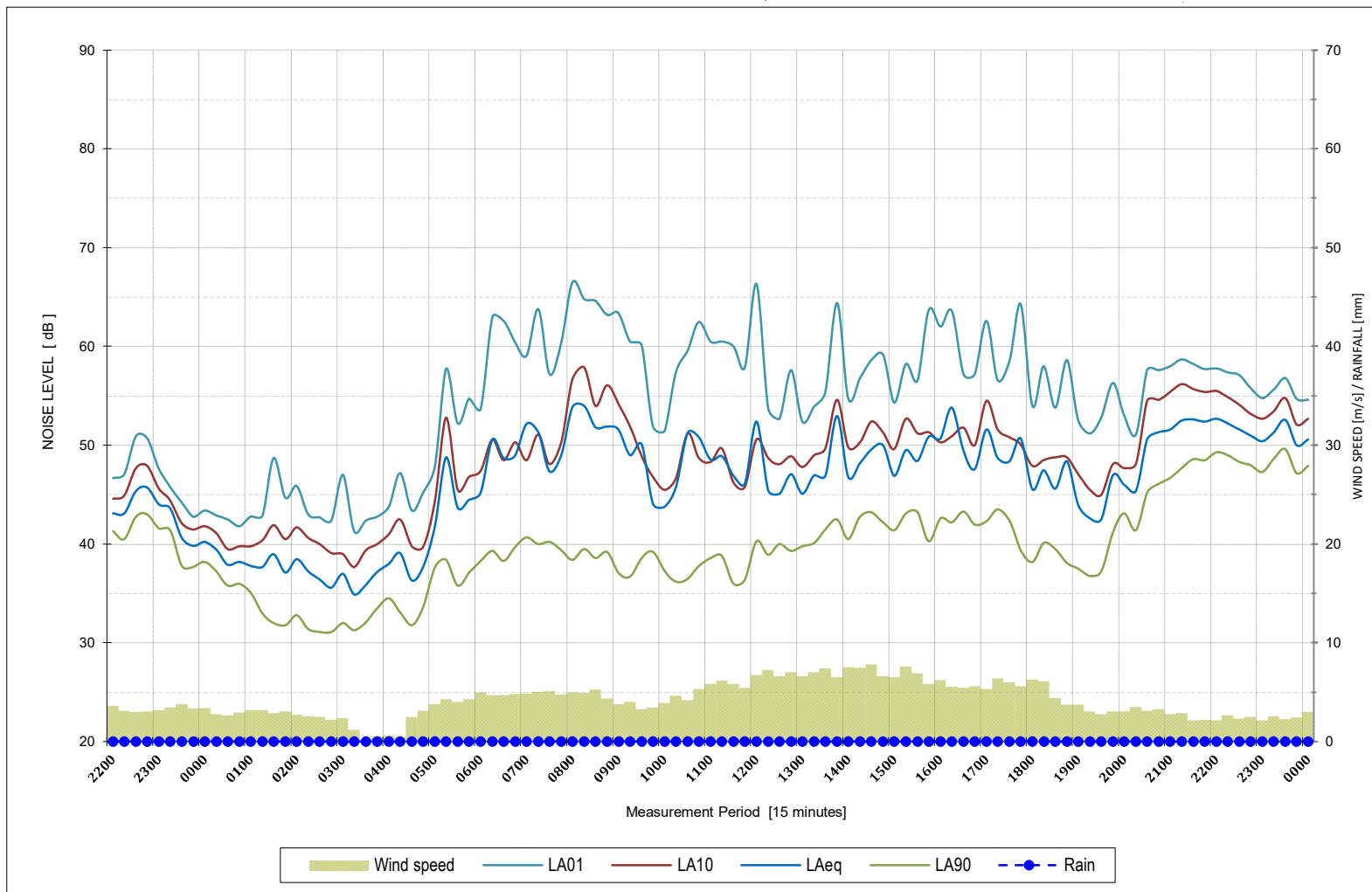
DATE: Tuesday, 16 November 2021



DAY 5

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

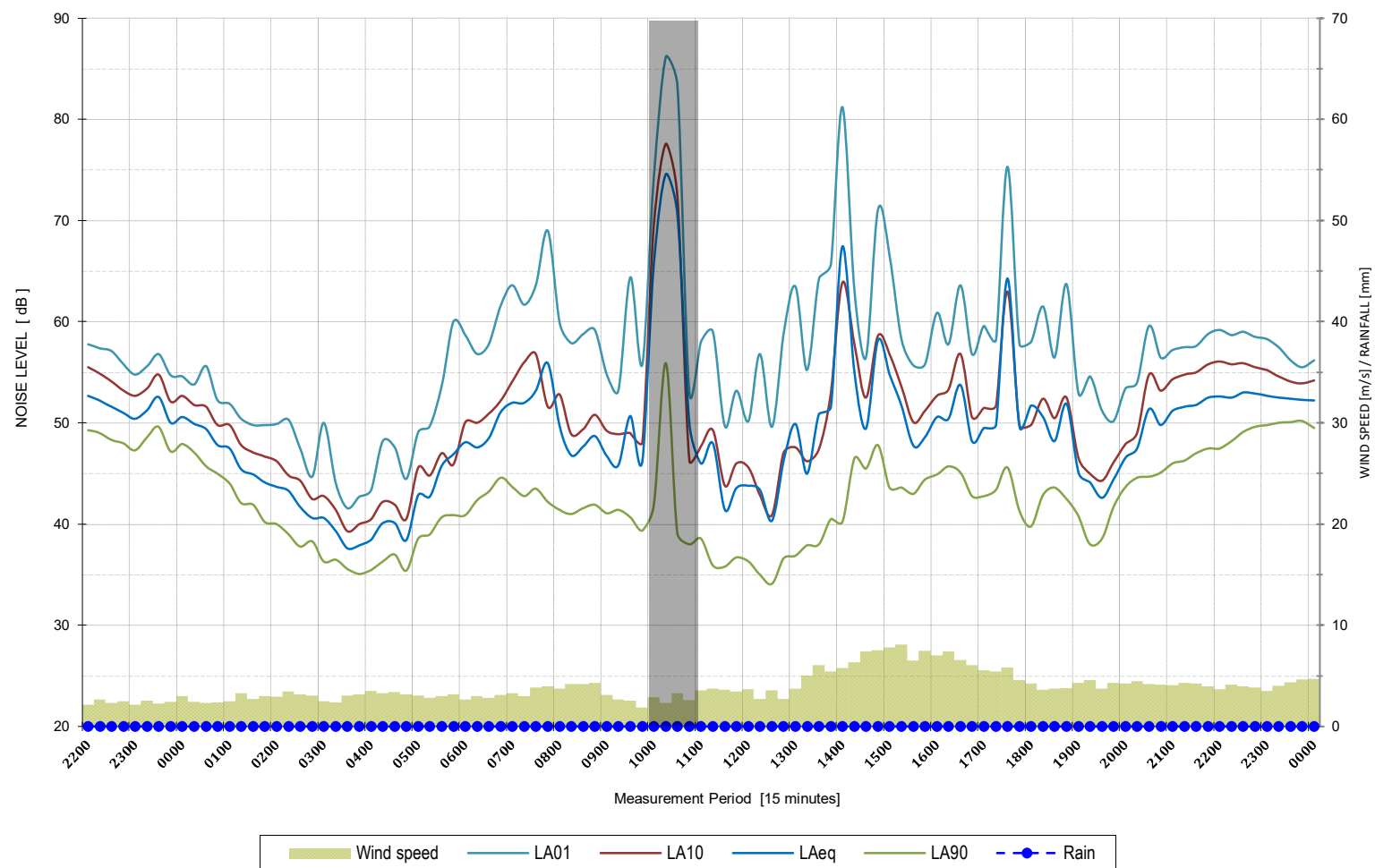
DATE: Wednesday, 17 November 2021



DAY 6

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

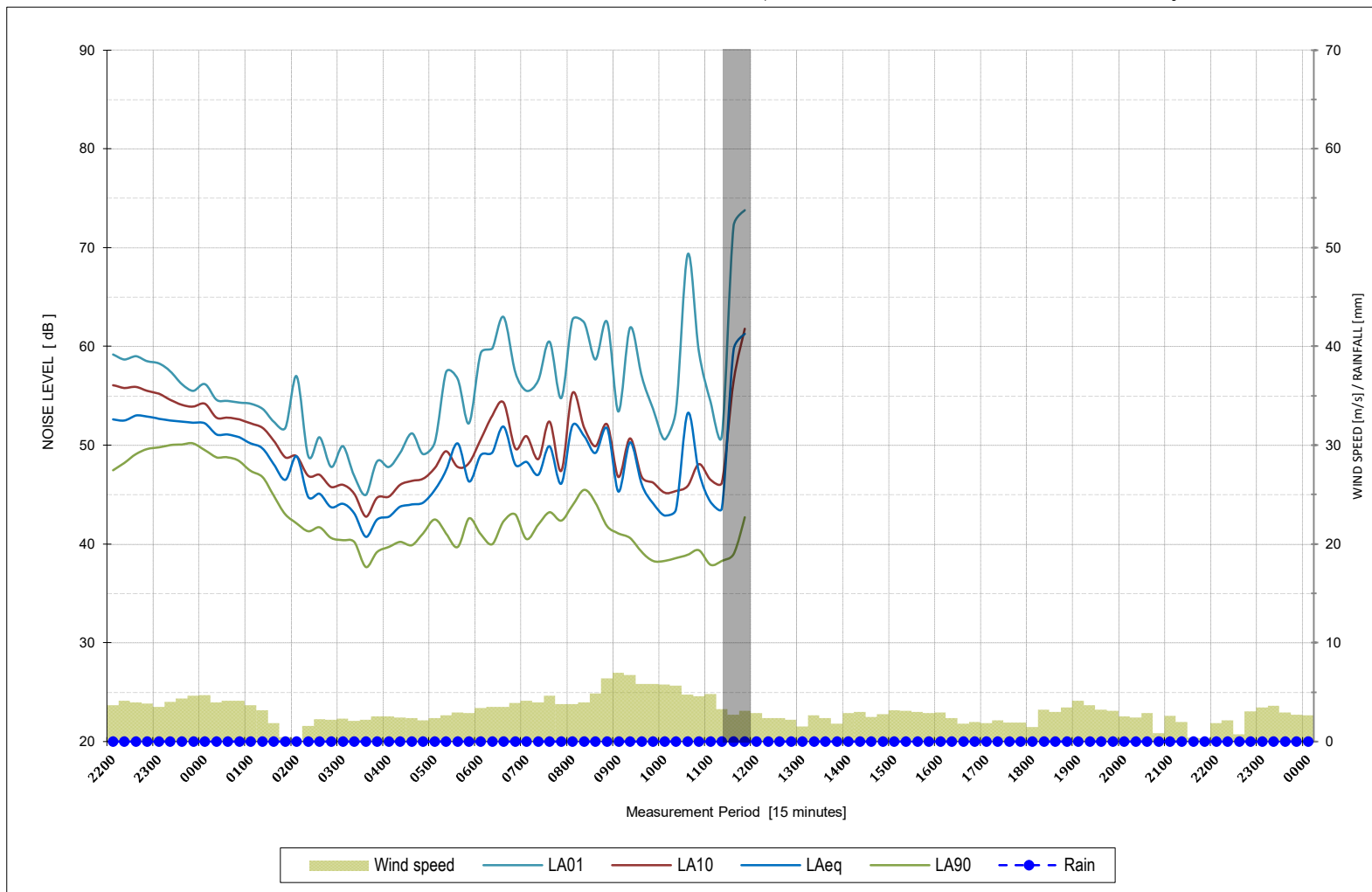
DATE: Thursday, 18 November 2021



DAY 7

LOGGER LOCATION: R3: 87 Pindimar Road, Tea Gardens

DATE: Friday, 19 November 2021



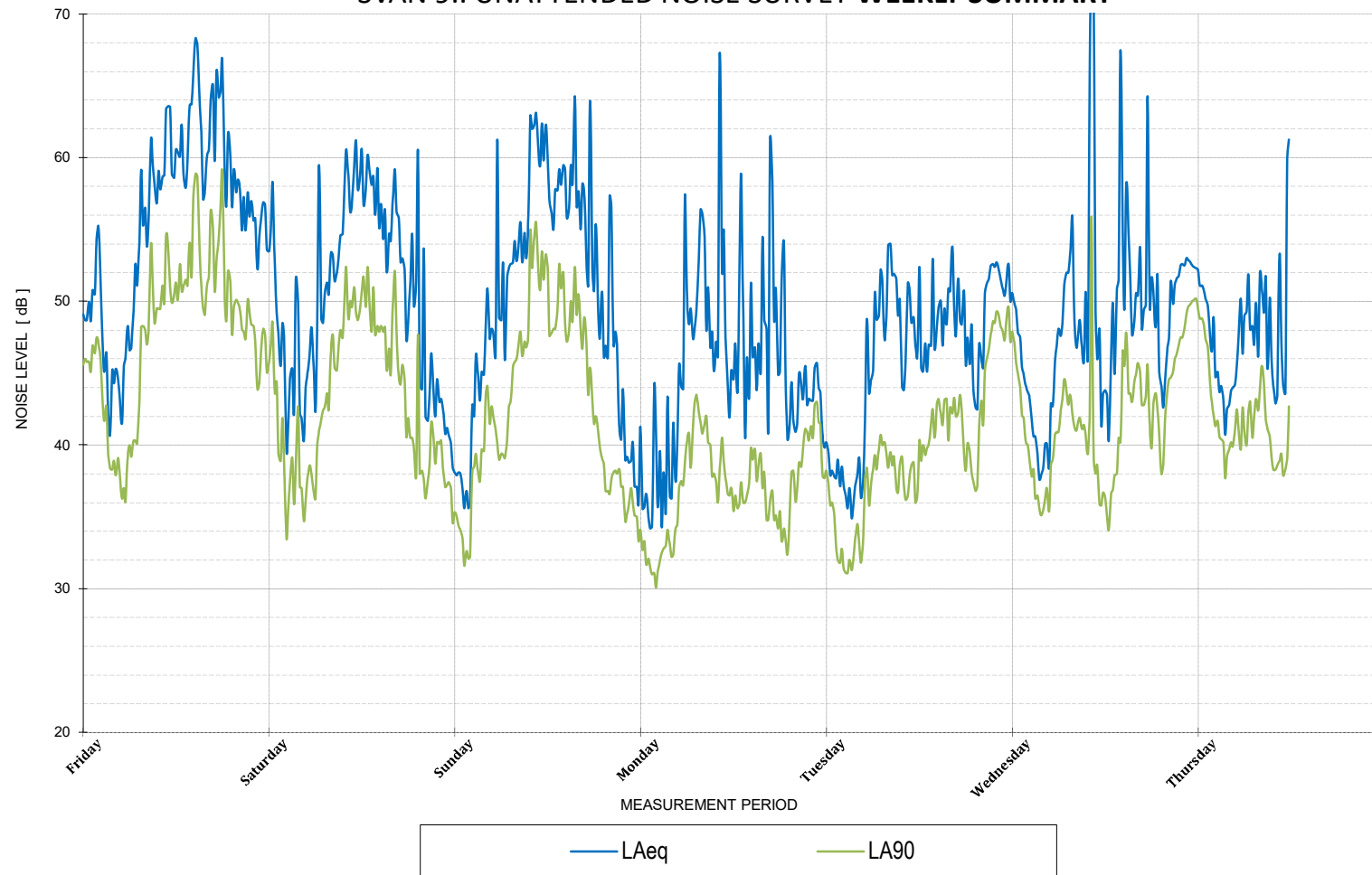


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R3: 87 Pindimar Road, Tea Gardens

**PERIOD:** 13th to the 19th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

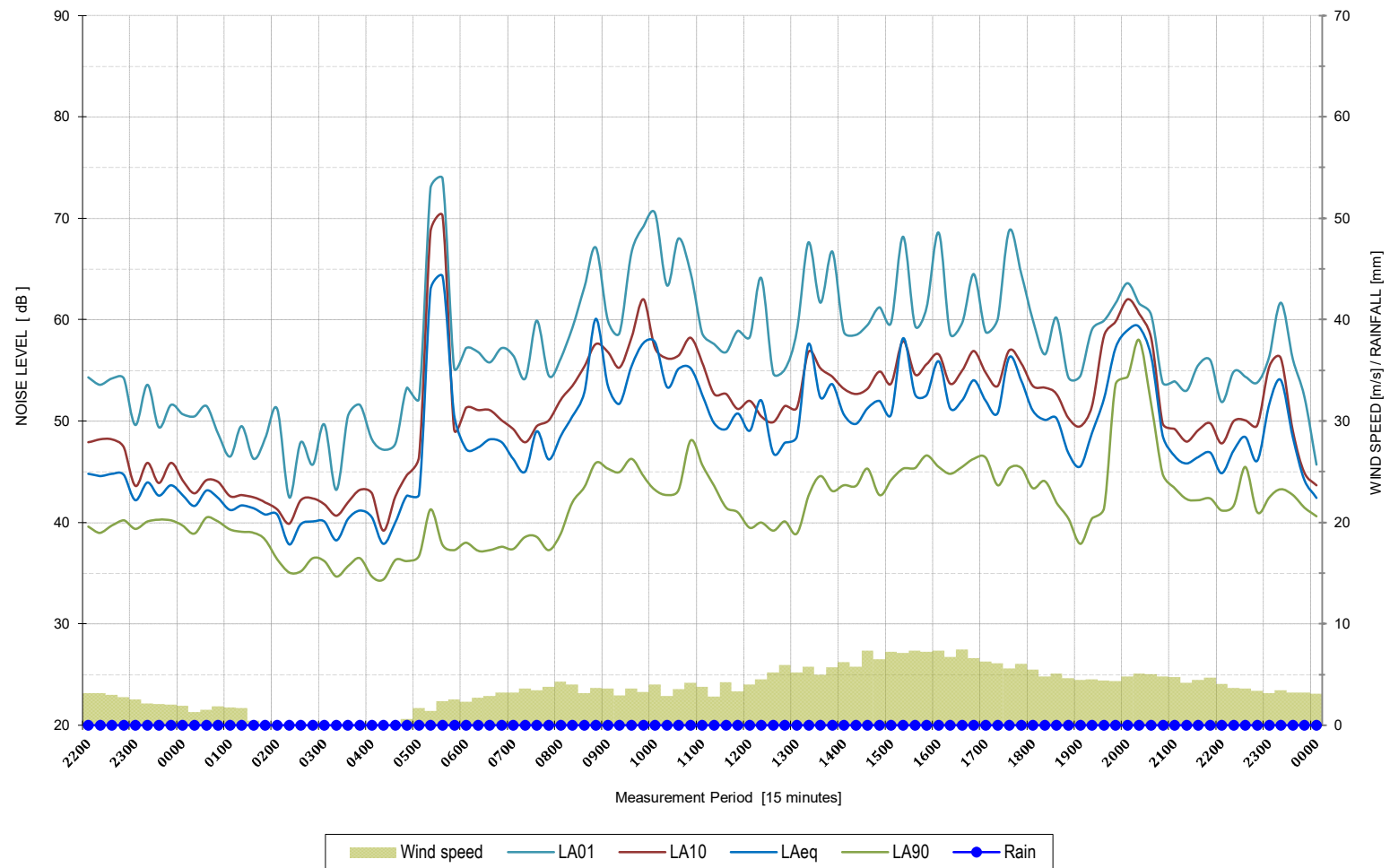


*Sundays and Public Holidays the hours change to 0800*

DAY 1

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

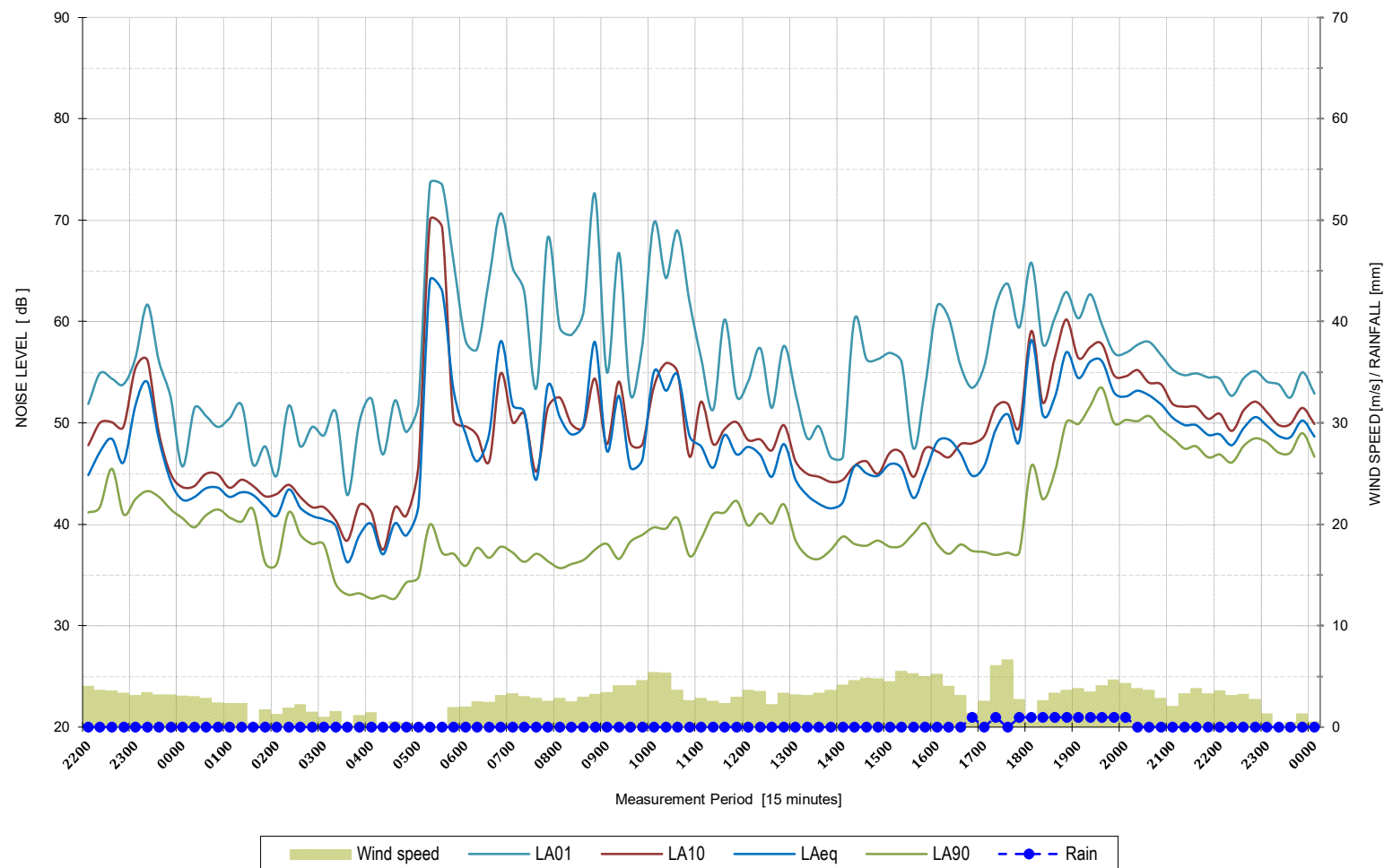
DATE: Saturday, 6 November 2021



DAY 2

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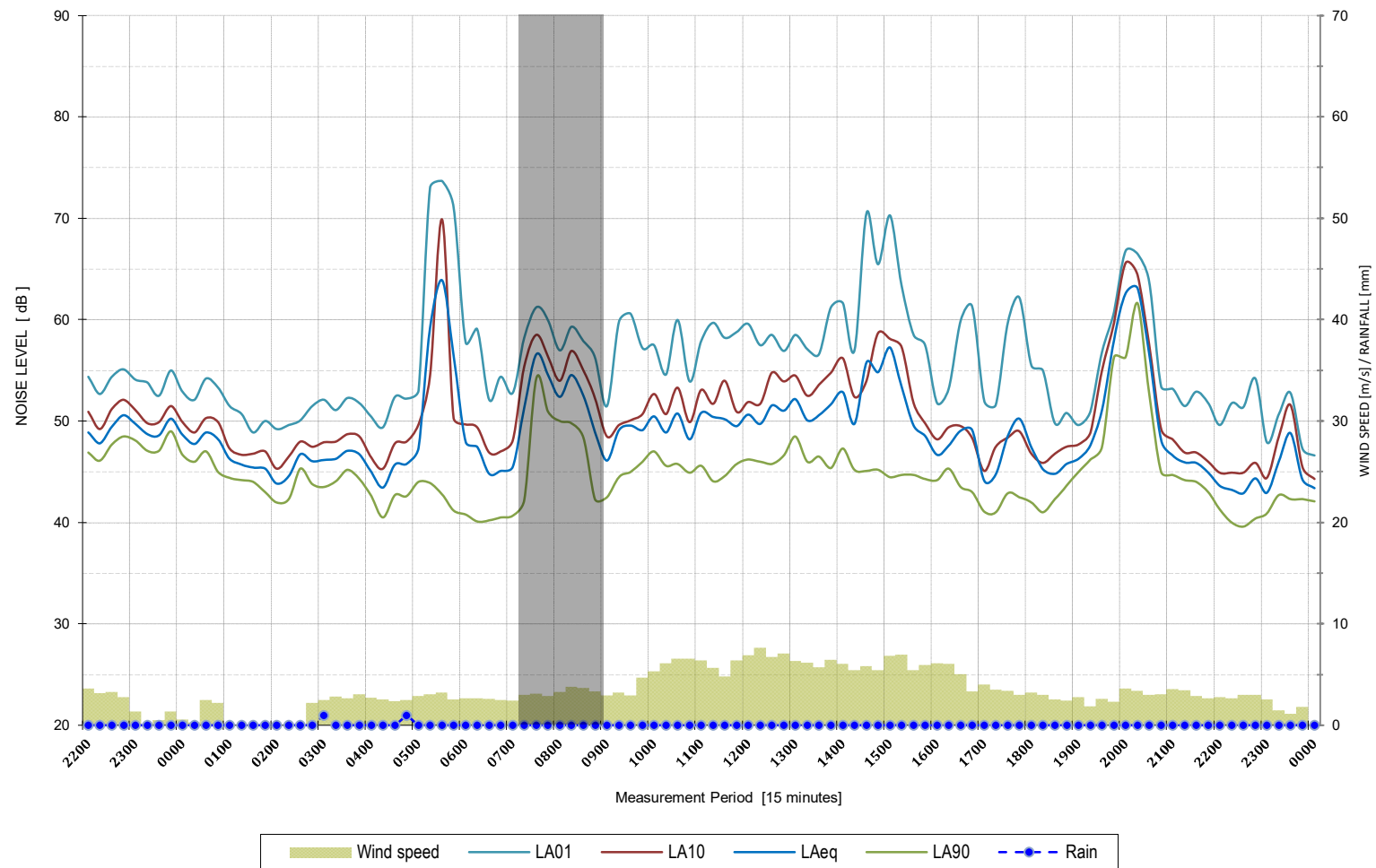
DATE: Sunday, 7 November 2021



DAY 3

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

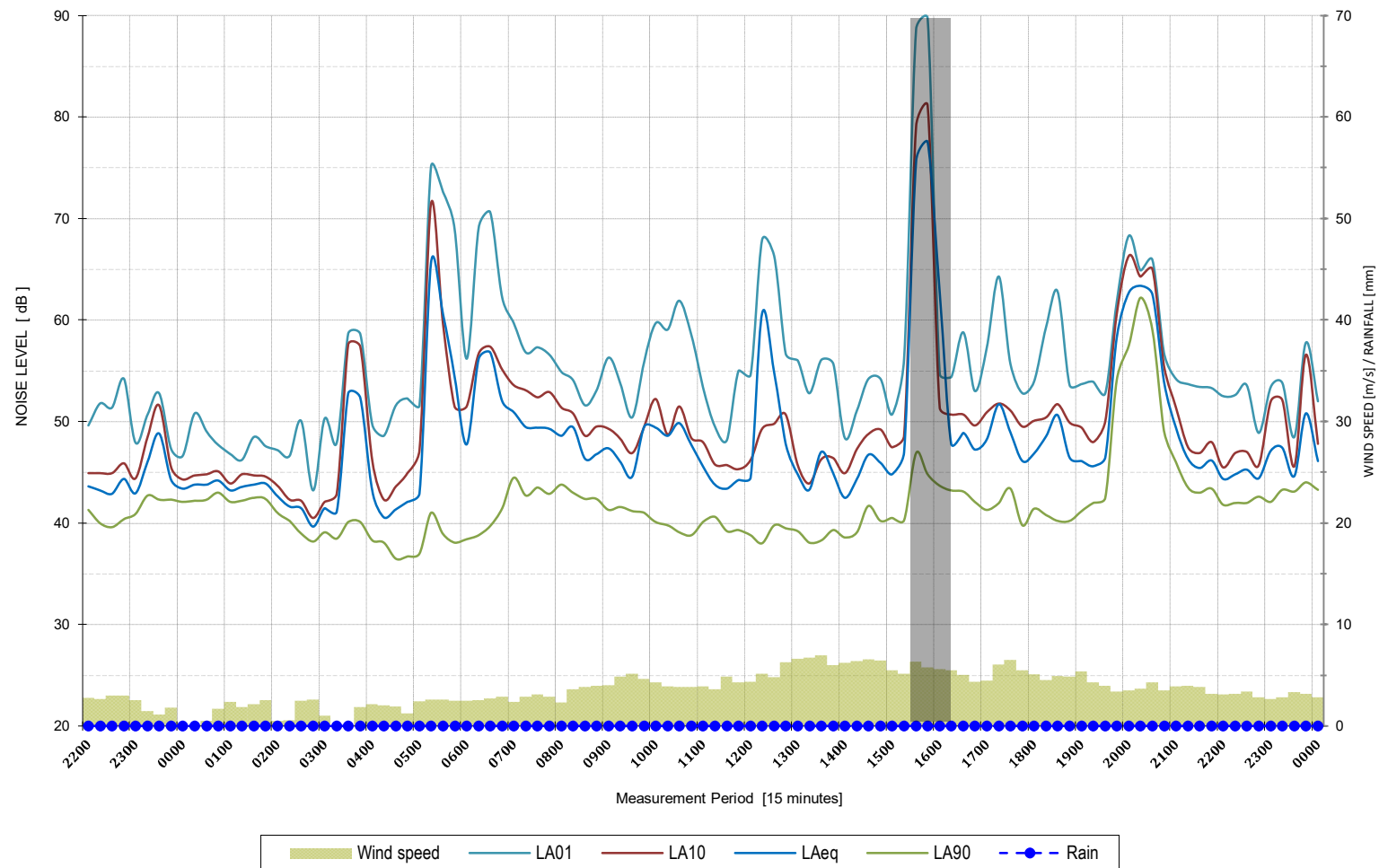
DATE: Monday, 8 November 2021



DAY 4

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

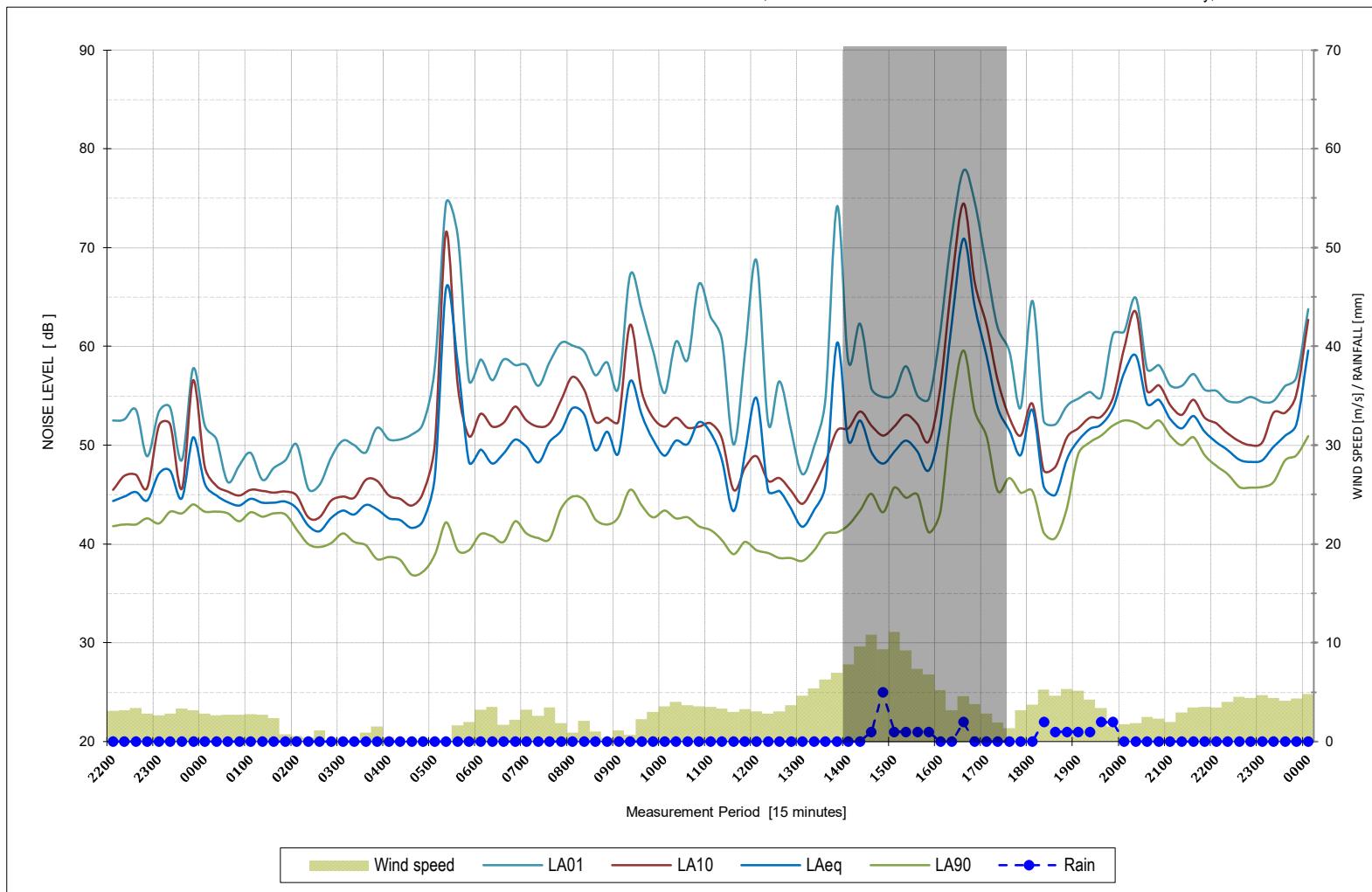
DATE: Tuesday, 9 November 2021



DAY 5

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

DATE: Wednesday, 10 November 2021

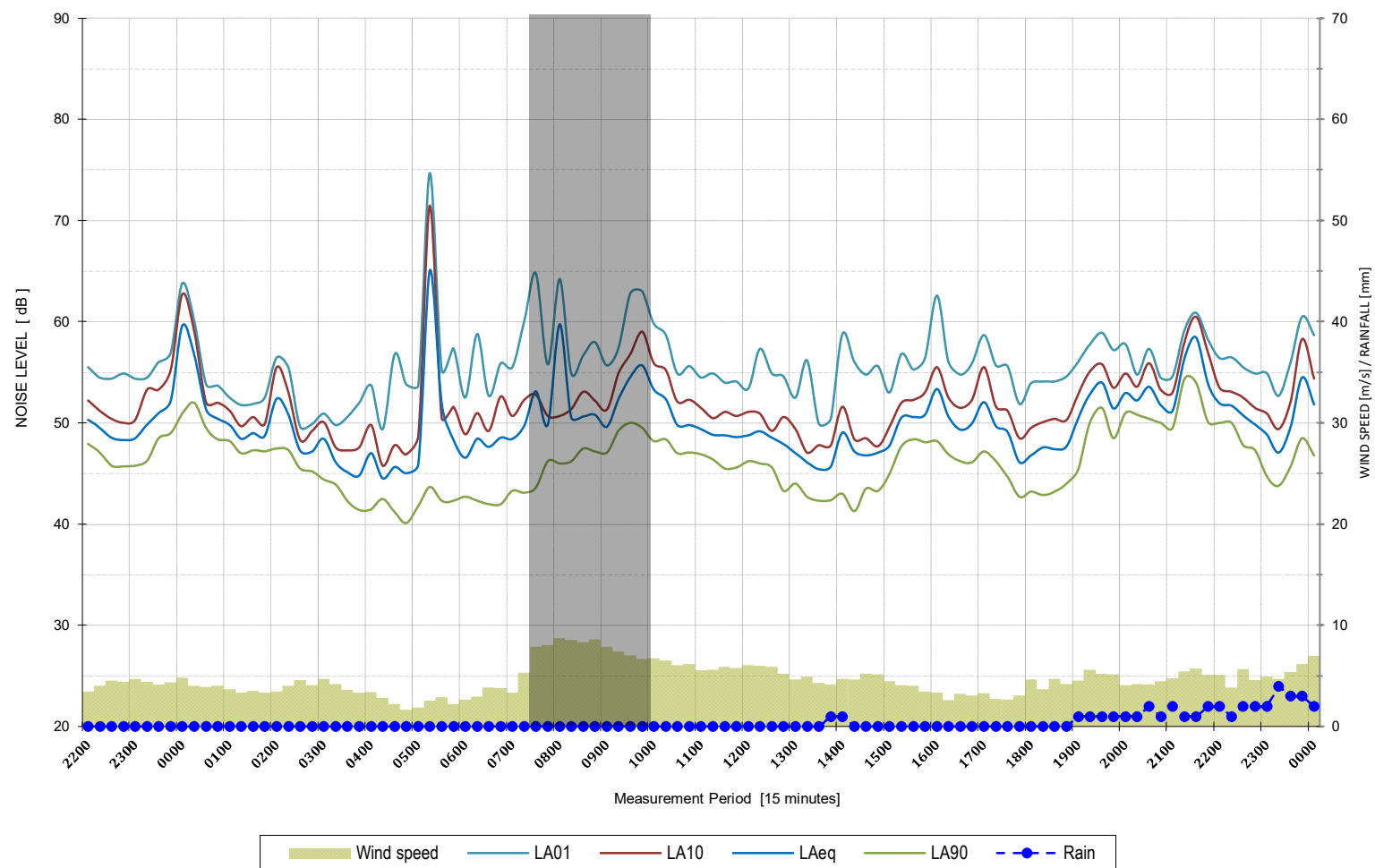




DAY 6

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

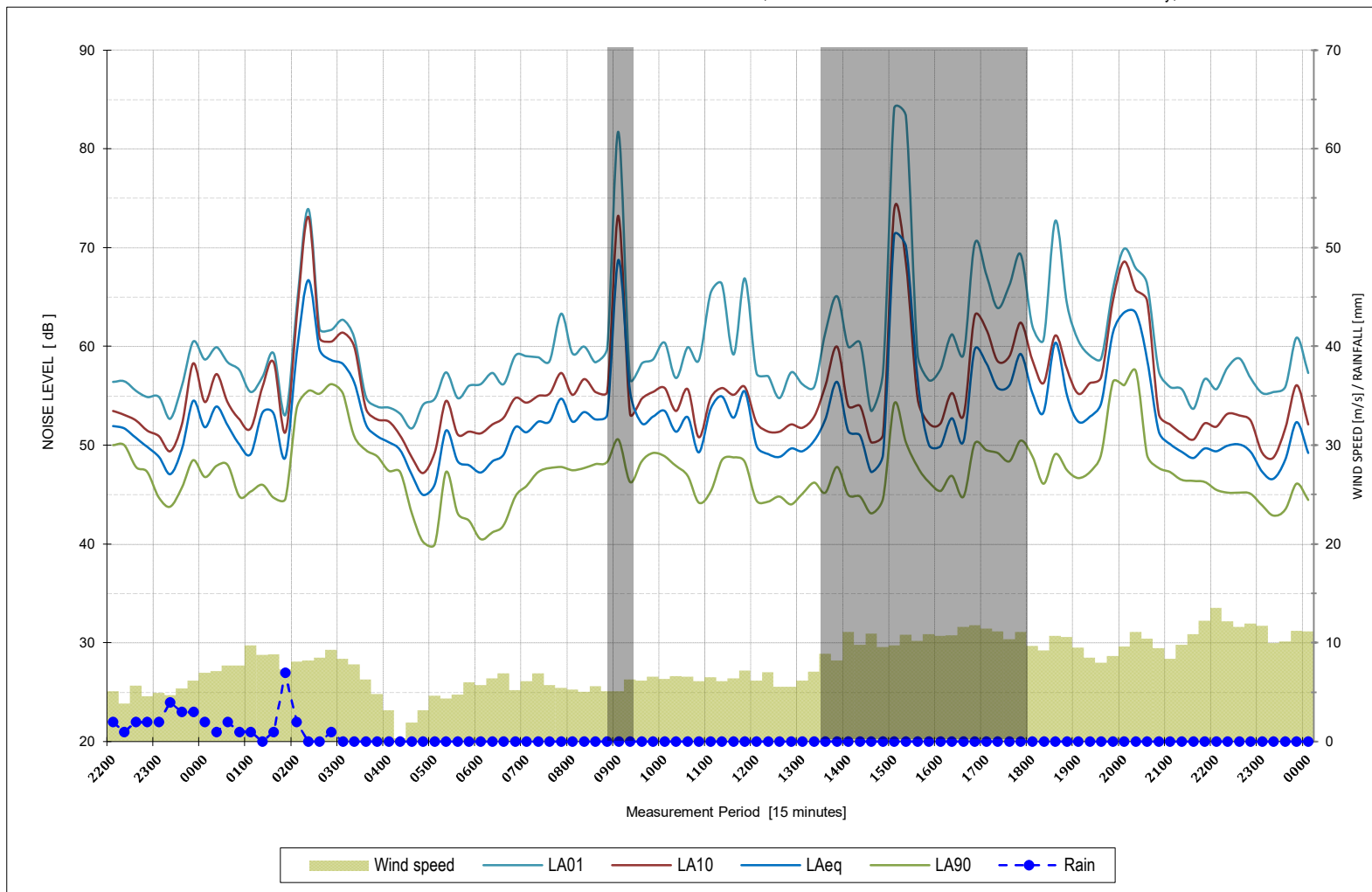
DATE: Thursday, 11 November 2021



DAY 7

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

DATE: Friday, 12 November 2021

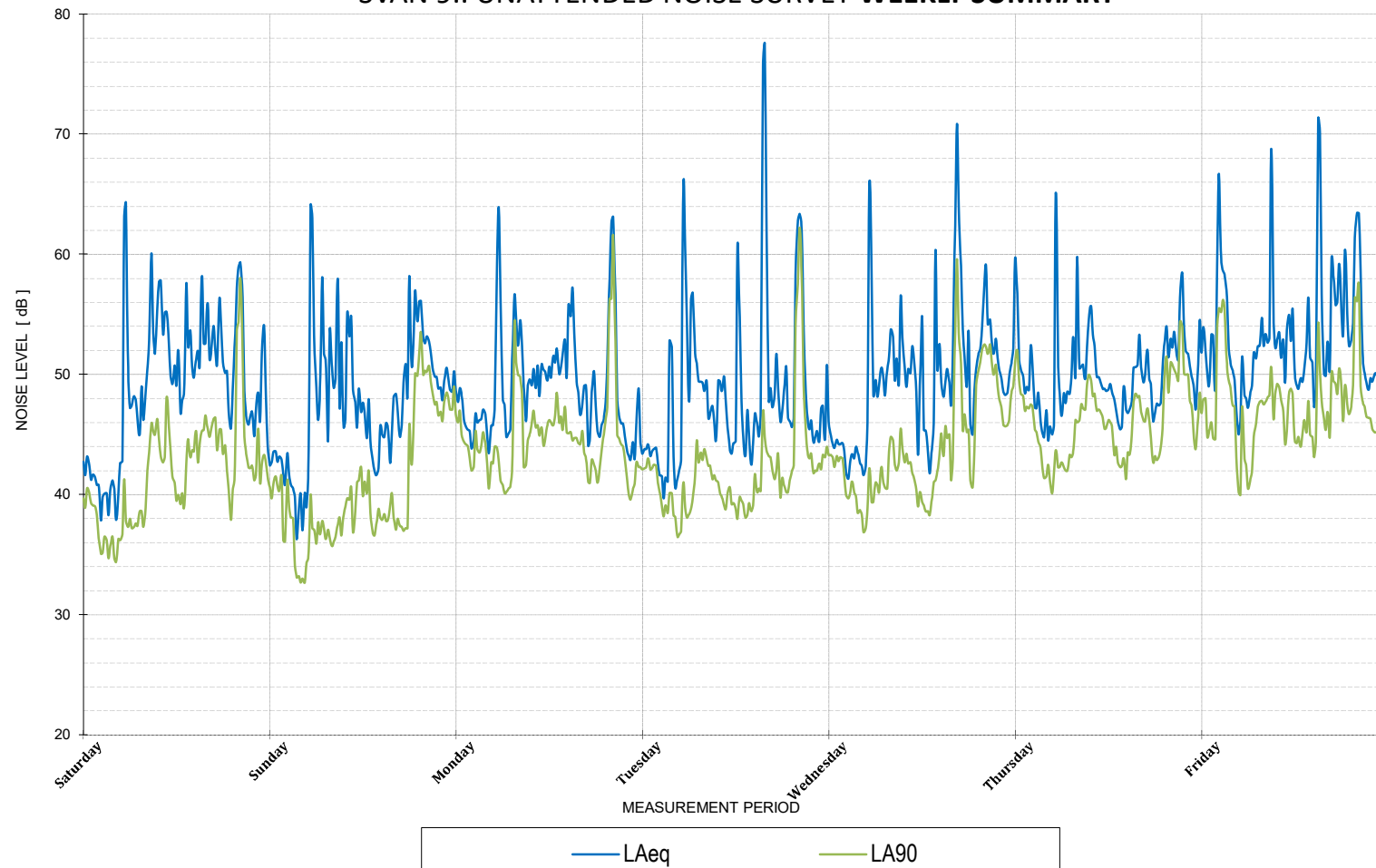


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R4: 27 Pindimar Road, Tea Gardens

**PERIOD:** 6th to the 11th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**

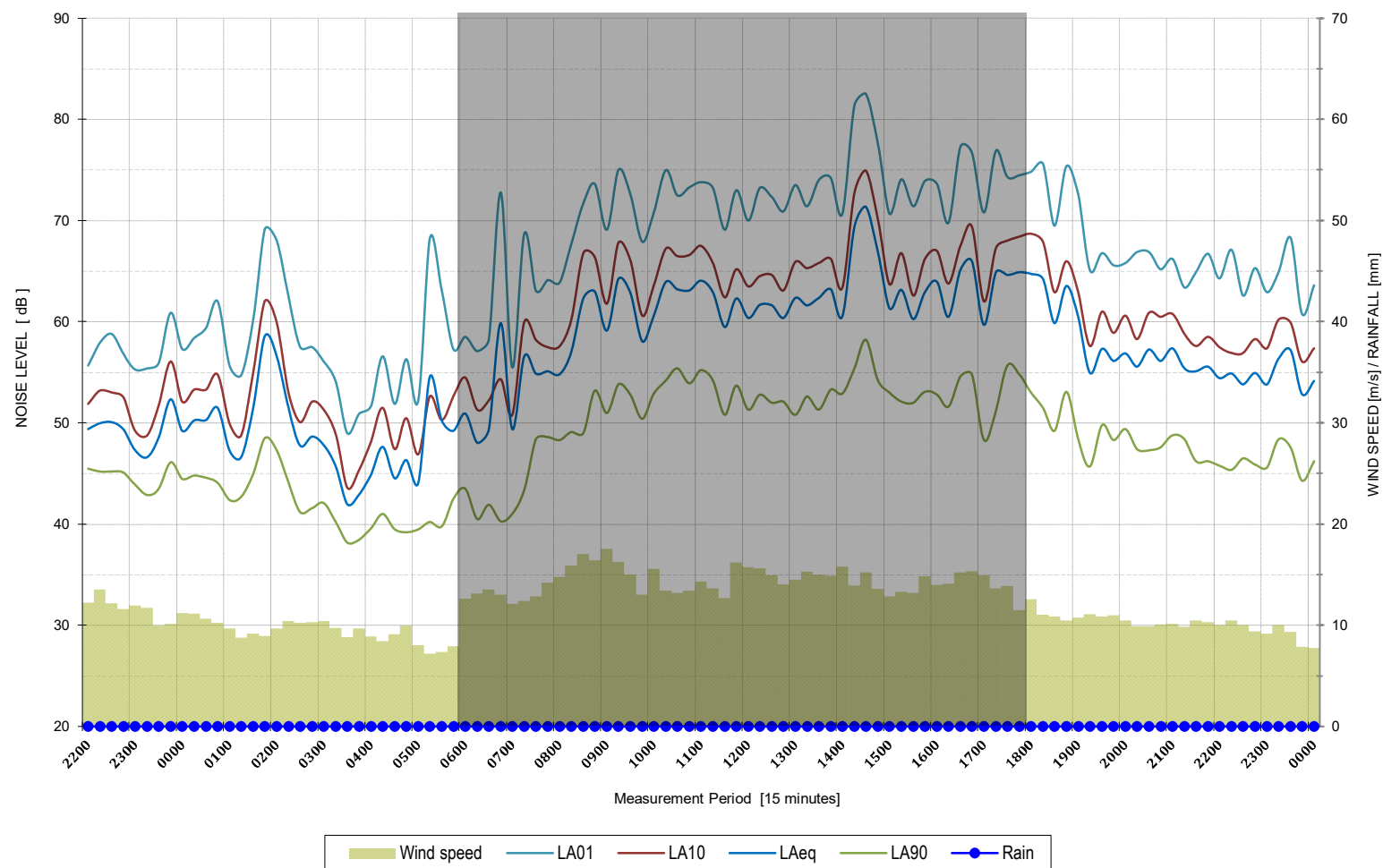


*Sundays and Public Holidays the hours change to 0800*

DAY 1

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

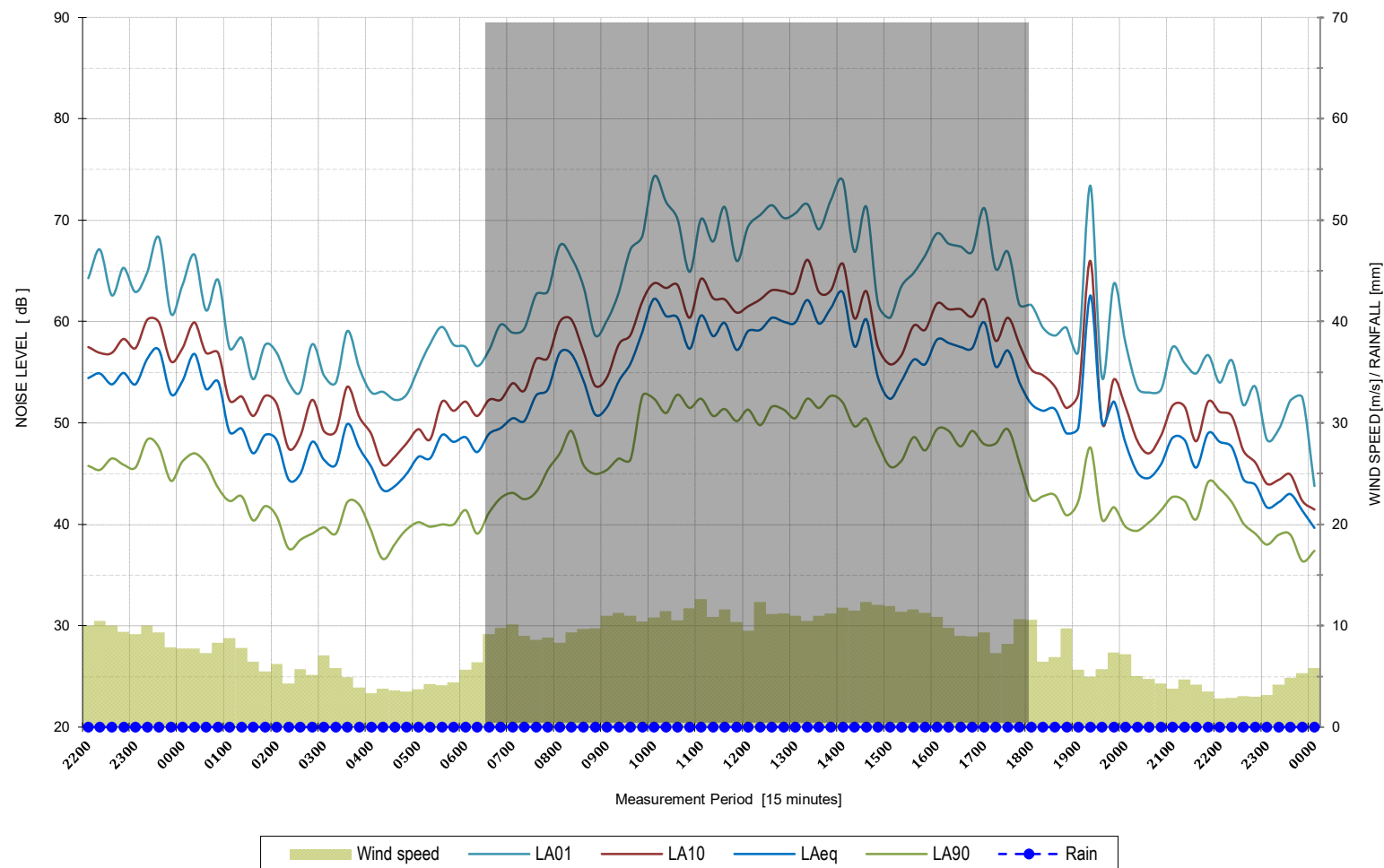
DATE: Saturday, 13 November 2021



DAY 2

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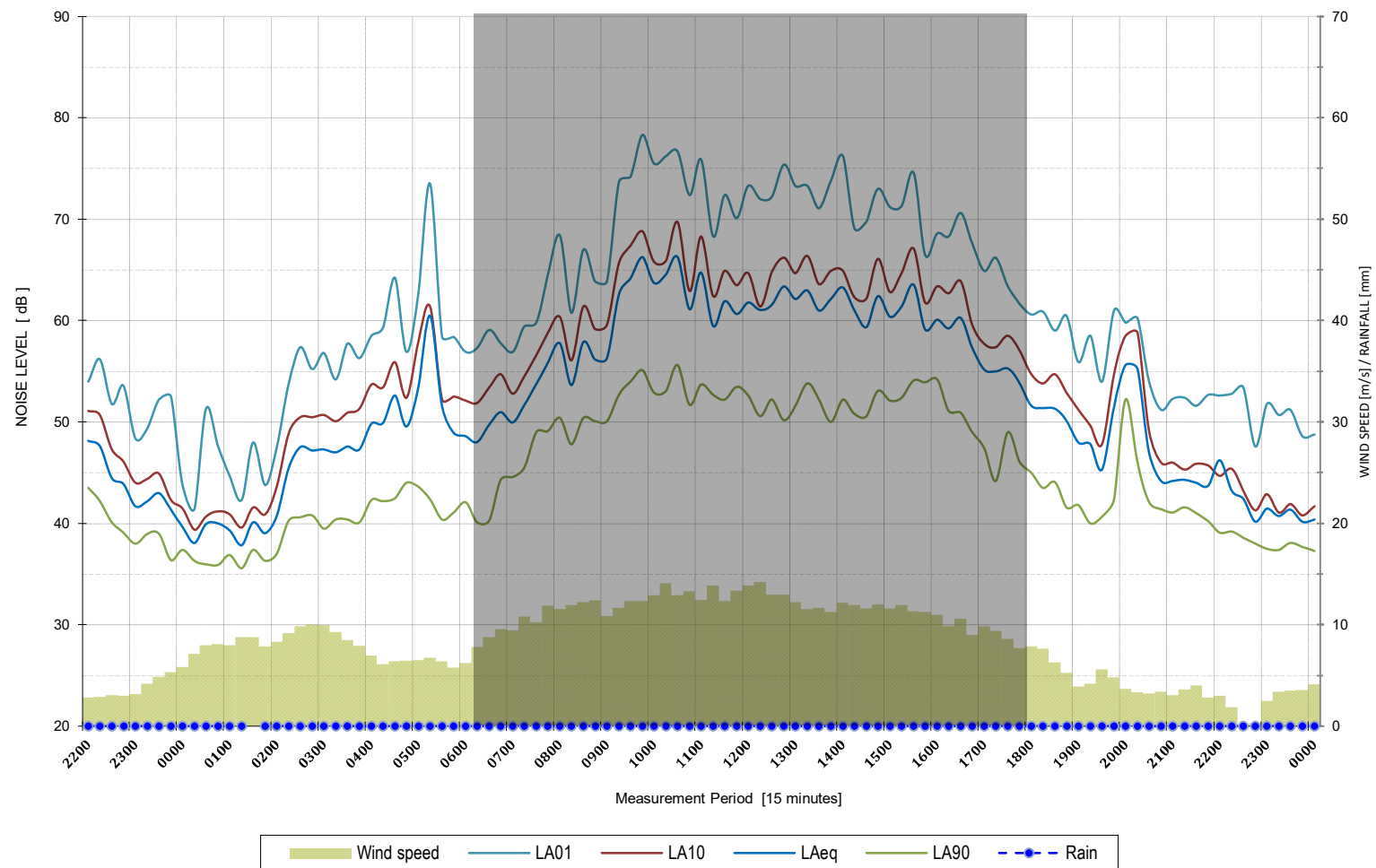
DATE: Sunday, 14 November 2021



DAY 3

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DATE: Monday, 15 November 2021

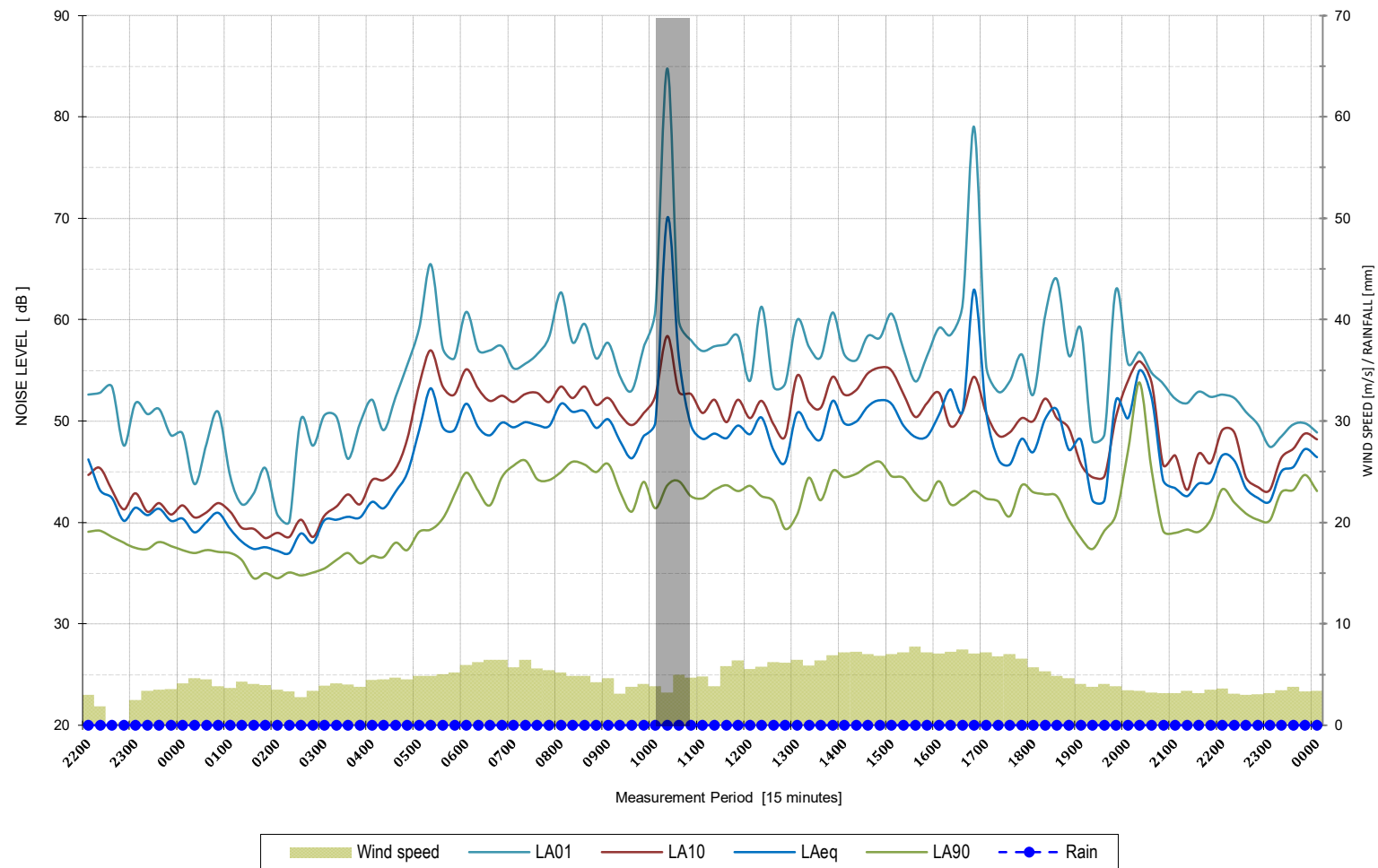




DAY 4

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

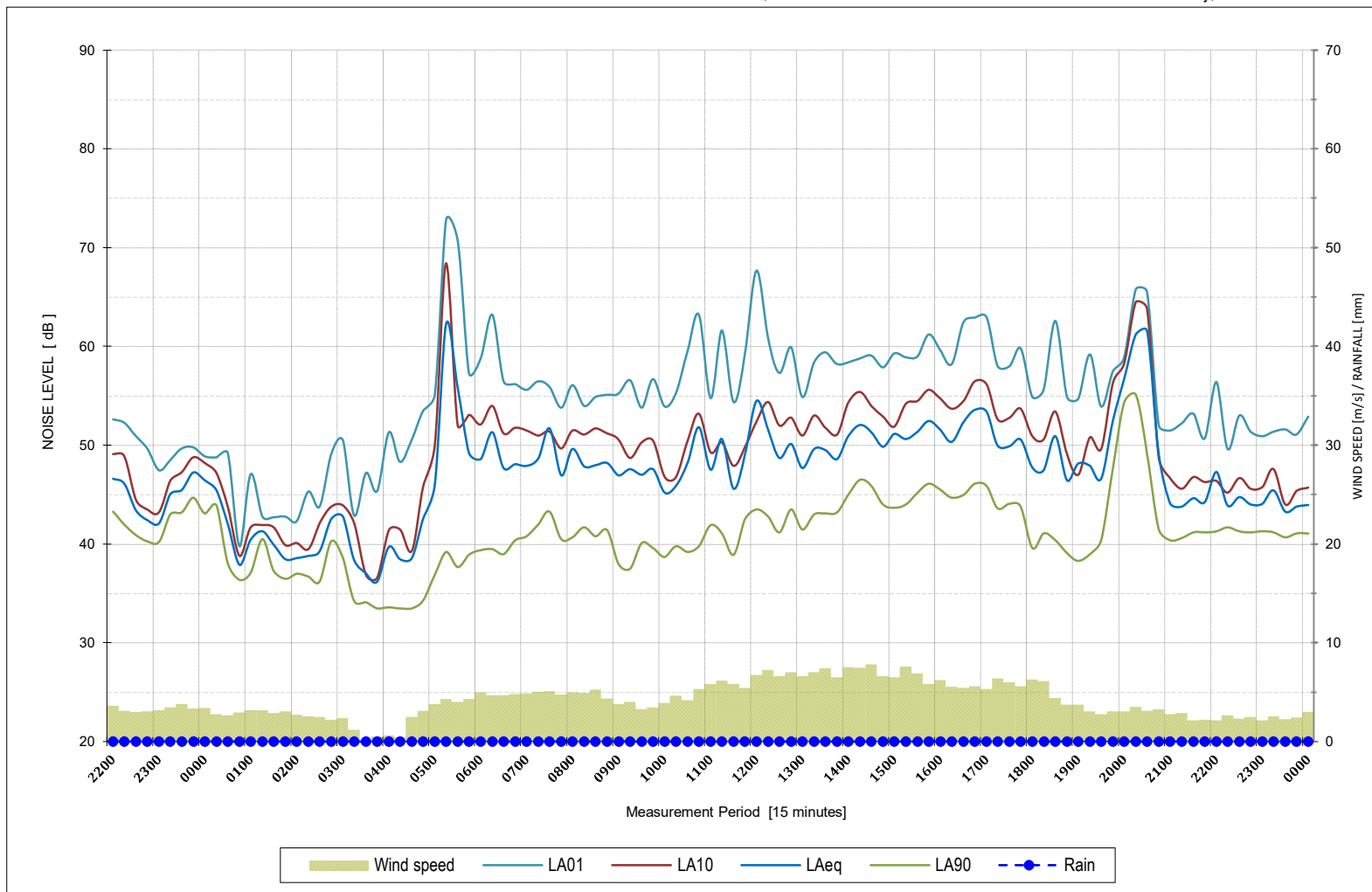
DATE: Tuesday, 16 November 2021



DAY 5

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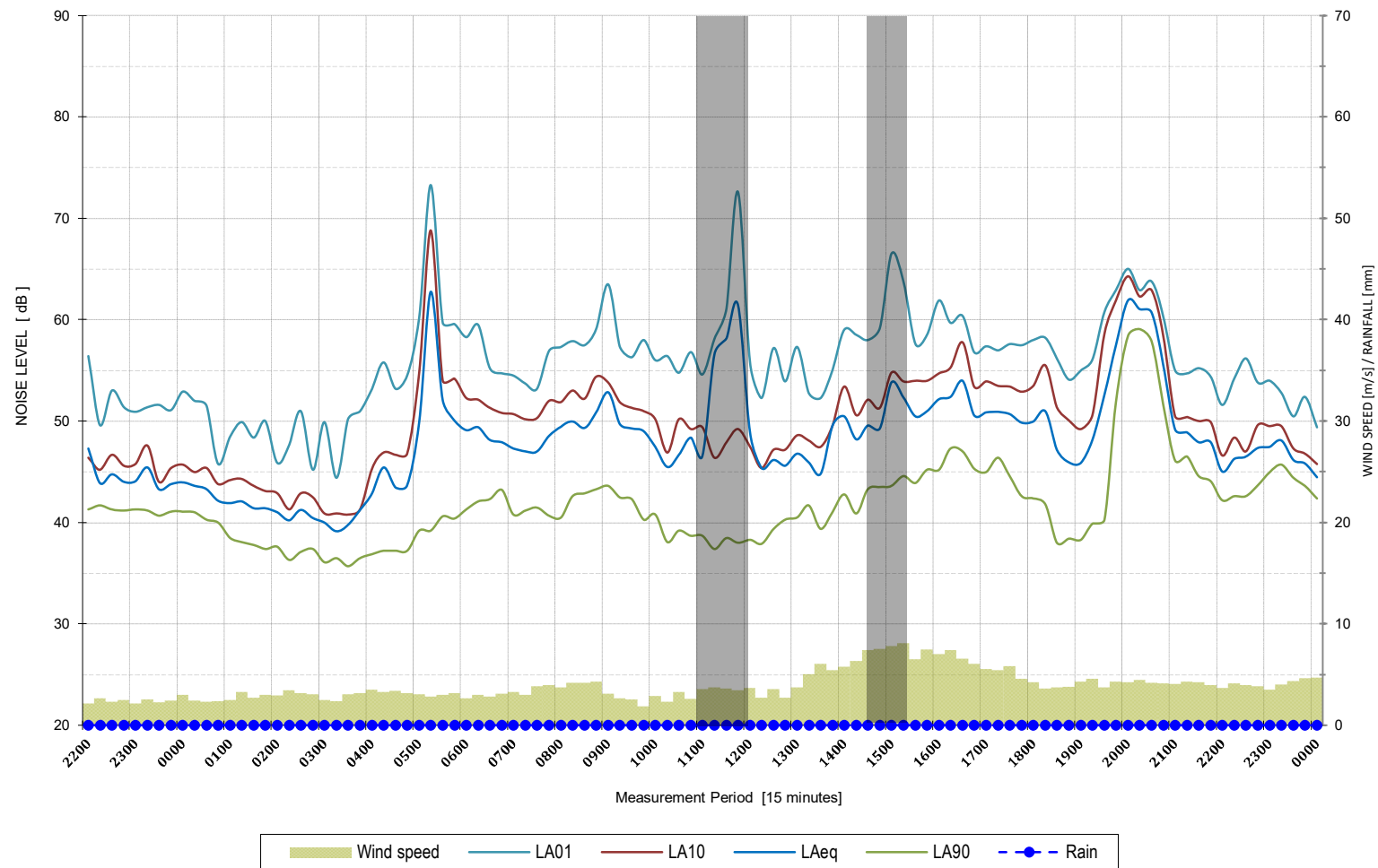
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DAY 6

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

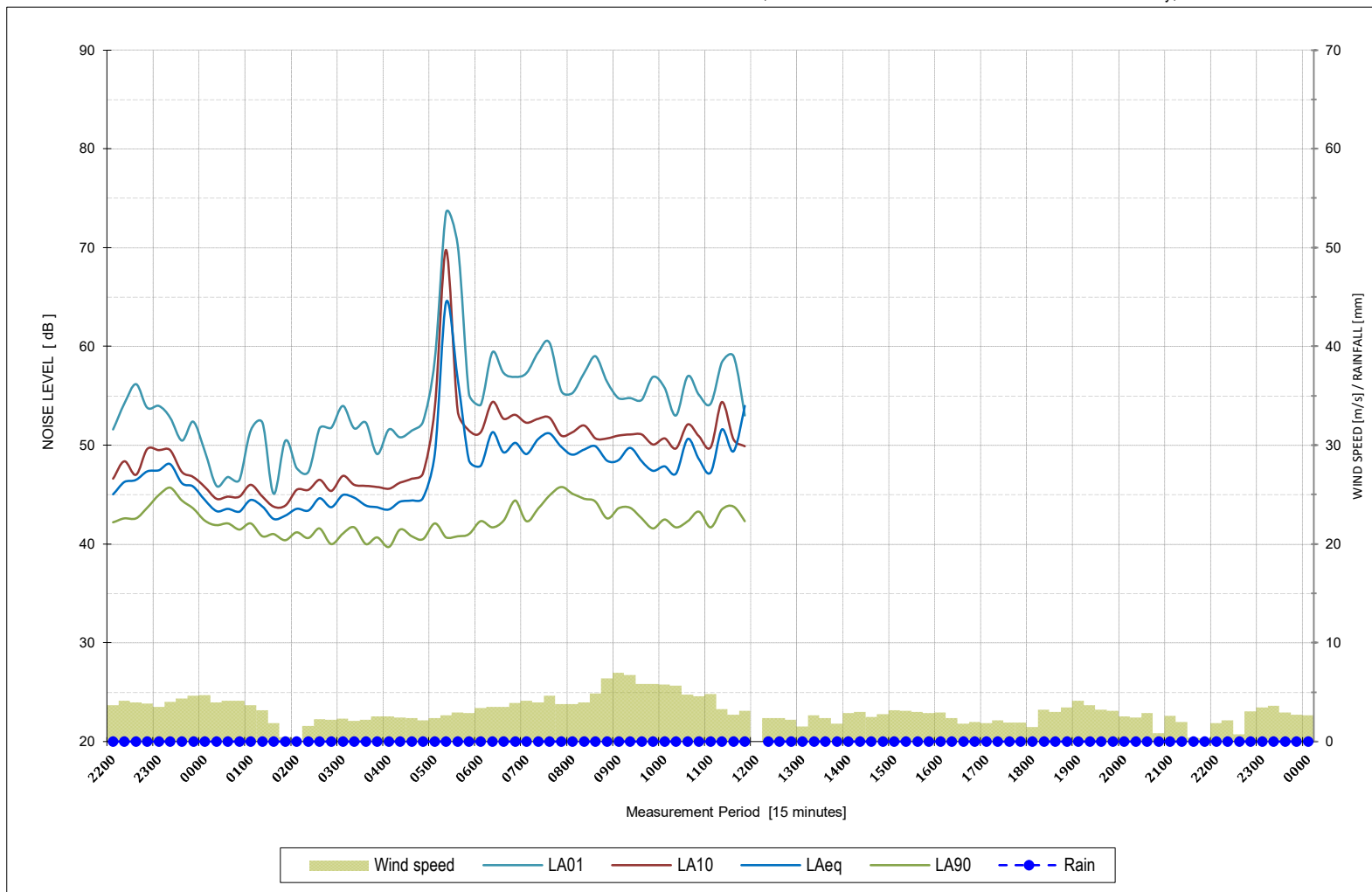
DATE: Thursday, 18 November 2021



DAY 7

LOGGER LOCATION: R4: 27 Pindimar Road, Tea Gardens

DATE: Friday, 19 November 2021

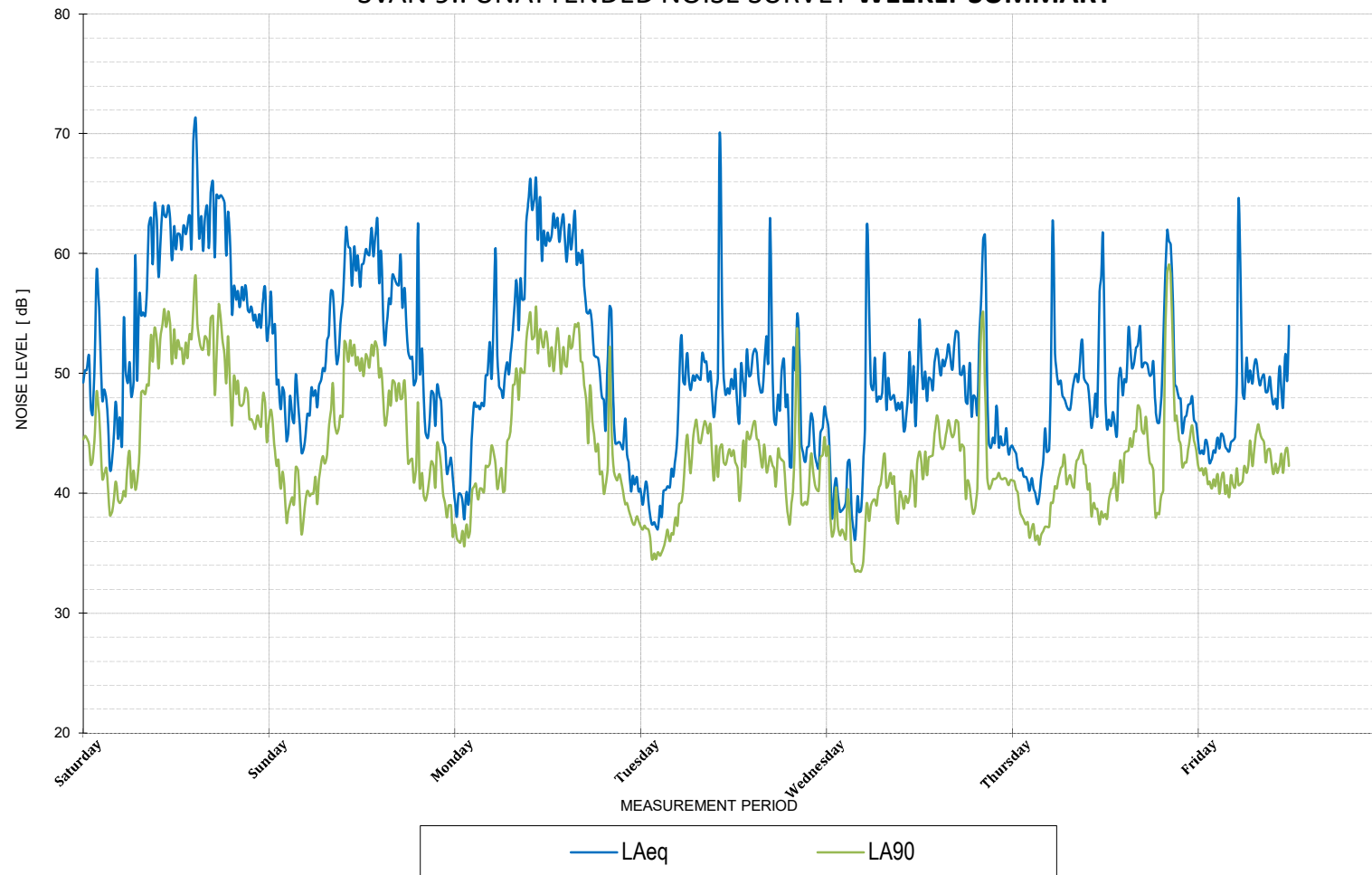


**WEEKLY SUMMARY**

**LOGGER LOCATION:** R4: 27 Pindimar Road, Tea Gardens

**PERIOD:** 13th to the 19th November 2021

**SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY**



*Sundays and Public Holidays the hours change to 0800*

**APPENDIX**

**B**

**A  
P  
P  
E  
N  
D  
I  
X**

**B**

**APPENDIX**

**B**



## \*\* SCENARIO 1A \*\*

[Day - 7 am to 6 pm]

- ~ External sources
  - 4 screeners working and loading
  - 3 loaders
  - Silt trap pump
  - Trucks in/out
- ~ Wood waste processing shed (doors closed)
  - High-speed grinder
  - Screener
  - Truck being loaded
  - 2 x AeroSorb fans
- ~ Packaging building/workshop (doors open)
  - Truck idling
  - Forklift loading a truck
- ~ Hay baling and storage sheds
  - Vacuum sealer and baler
  - Conveyor and baler
  - Forklift

### NOTES:

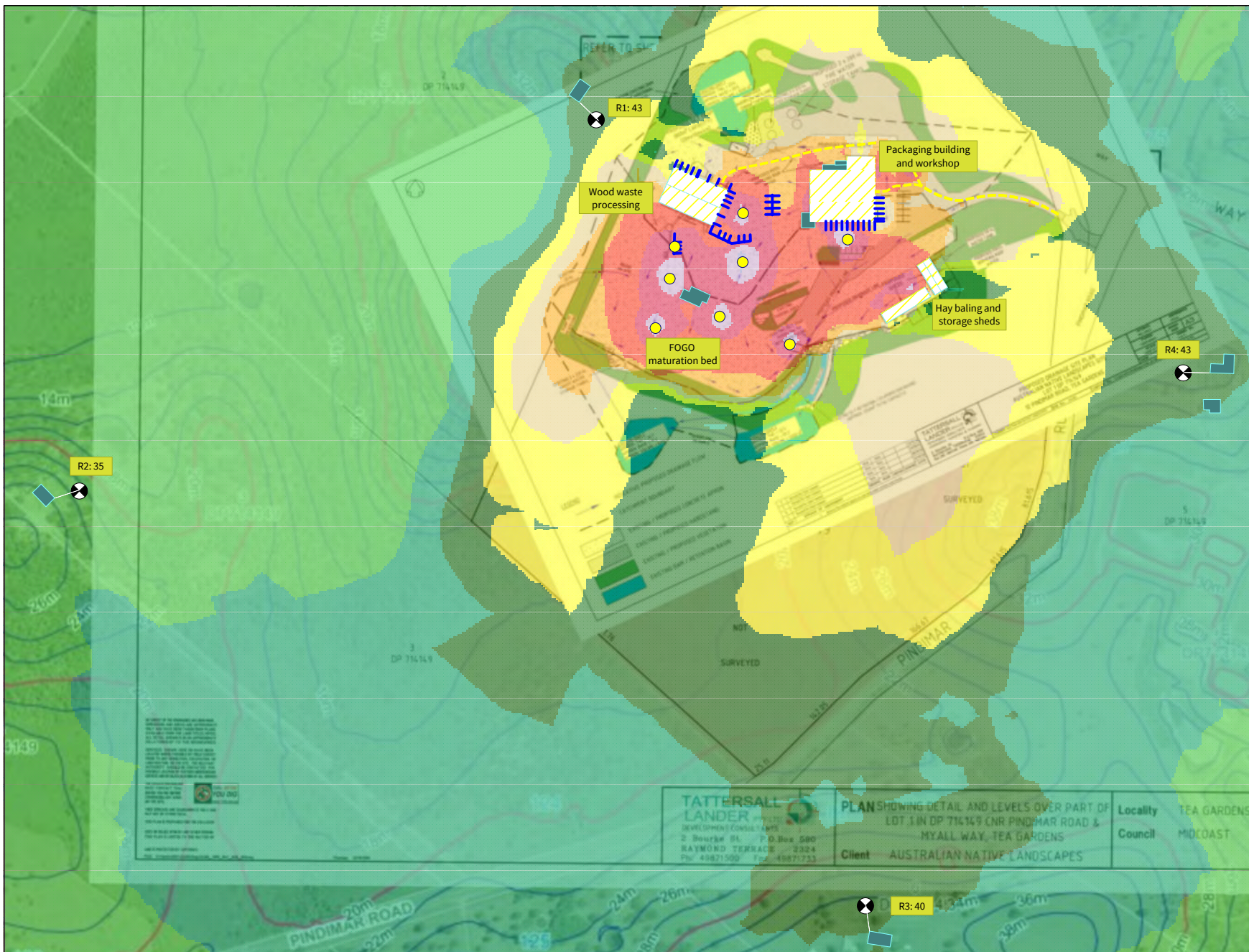
1. Noise levels shown are LAeq 15 mins
2. Receivers at 1.5 m above ground.
3. Noise contours at 1.5 m above ground.

PRINT DATE: 7.03.2024

VERSION: 5073 - SC1A

- Point Source
- Line Source
- /// Area Source
- vert. Area Source
- Building
- Barrier
- Foliage
- Ground Absorption
- Contour Line
- ⊗ Receiver
- Calculation Area

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)





## \*\* SCENARIO 1B \*\*

[Day - 7 am to 6 pm]

- ~ External sources
  - 4 screeners working and loading
  - 3 loaders
  - Silt trap pump
  - Trucks in/out
- ~ Wood waste processing shed (doors open)
  - Low-speed shredder
  - Screener
  - Truck being loaded
  - 2 x AeroSorb fans
- ~ Packaging building/workshop (doors open)
  - Truck idling
  - Forklift loading a truck
- ~ Hay baling and storage sheds
  - Vacuum sealer and baler
  - Conveyor and baler
  - Forklift

### NOTES:

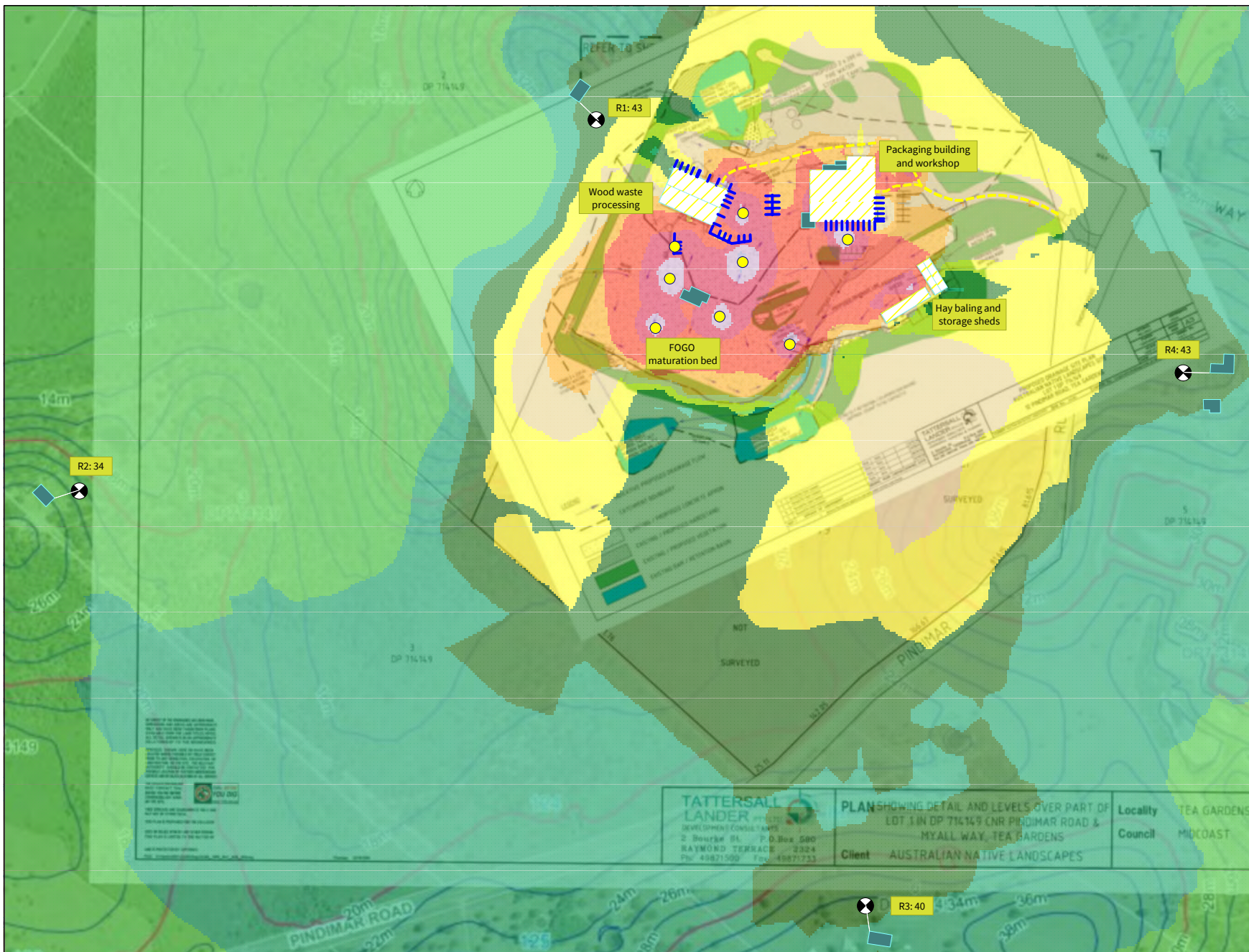
1. Noise levels shown are LAeq 15 mins
2. Receivers at 1.5 m above ground.
3. Noise contours at 1.5 m above ground.

PRINT DATE: 7.03.2024

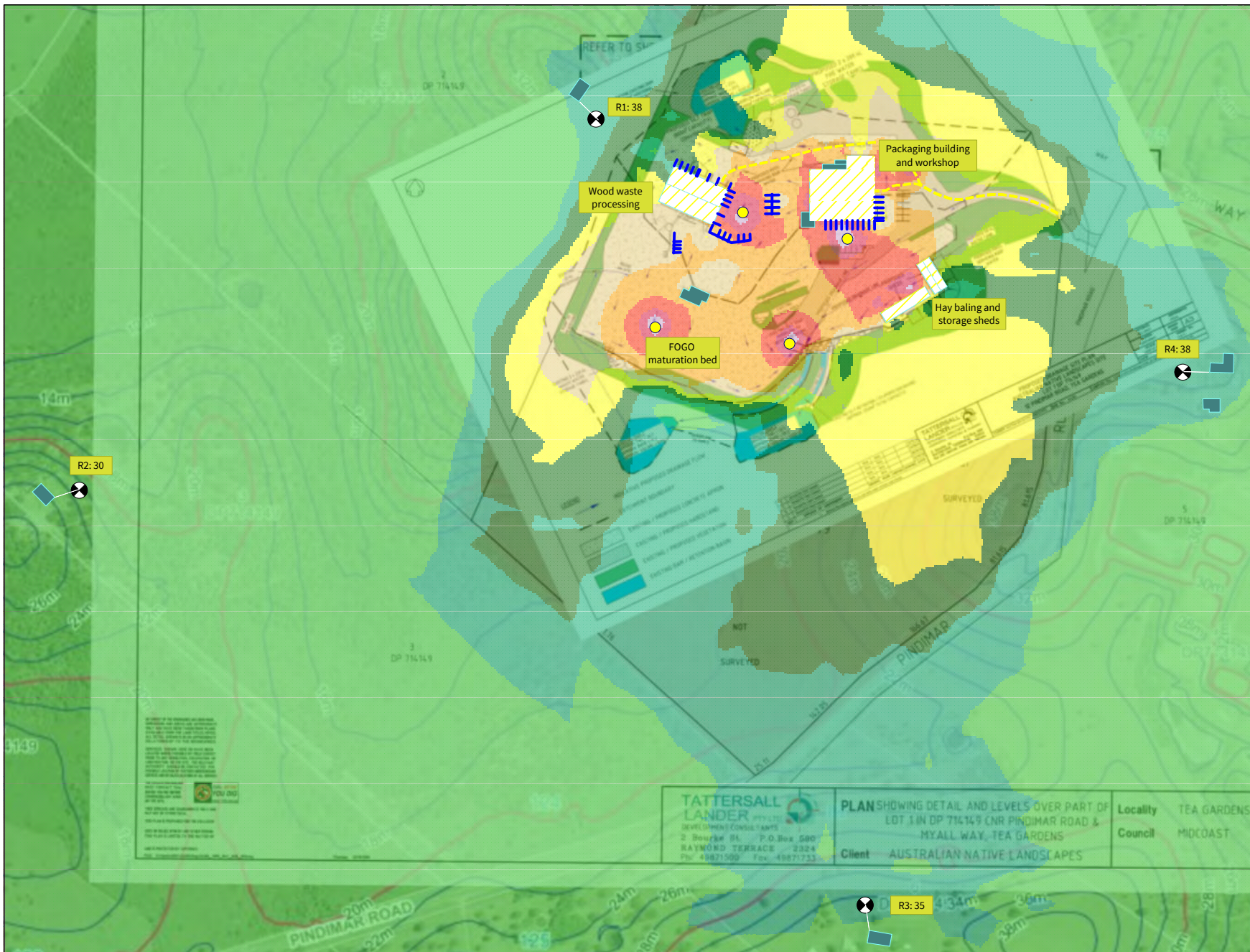
VERSION: 5073 - SC1B

- Point Source
- Line Source
- /// Area Source
- vert. Area Source
- Building
- Barrier
- Foliage
- Ground Absorption
- Contour Line
- ⊗ Receiver
- Calculation Area

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)







## \*\* SCENARIO 2 \*\*

### [Night - 6 am to 7 am]

- External sources
- No screeners
- 3 loaders
- Silt trap pump
- Trucks in/out
- Wood waste processing shed (doors closed)
  - Low-speed shredder
  - Screener
  - Truck being loaded
  - 2 x AeroSorb fans
- Packaging building/workshop (doors open)
  - Truck idling
  - Forklift loading a truck
- Hay baling and storage sheds
  - Vacuum sealer and baler
  - Conveyor and baler
  - Forklift

#### NOTES:

1. Noise levels shown are LAeq 15 mins
2. Receivers at 1.5 m above ground.
3. Noise contours at 1.5 m above ground.

PRINT DATE: 7.03.2024

VERSION: 5073 - SC2

- Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier
- Foliage
- Ground Absorption
- Contour Line
- ⊗ Receiver
- Calculation Area

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)



**\*\* SCENARIO 3 \*\***  
**[Night MAX - 6 am to 7 am]**

- ~ External sources
  - 4 screeners working and loading
  - 3 loaders
  - Silt trap pump
  - Trucks in/out
- ~ Wood waste processing shed (doors closed)
  - Low-speed shredder
  - Screener
  - Truck being loaded
  - 2 x AeroSorb fans
- ~ Packaging building/workshop (doors open)
  - Truck idling
  - Forklift loading a truck
- ~ Hay baling and storage sheds
  - Vacuum sealer and baler
  - Conveyor and baler
  - Forklift

**NOTES:**

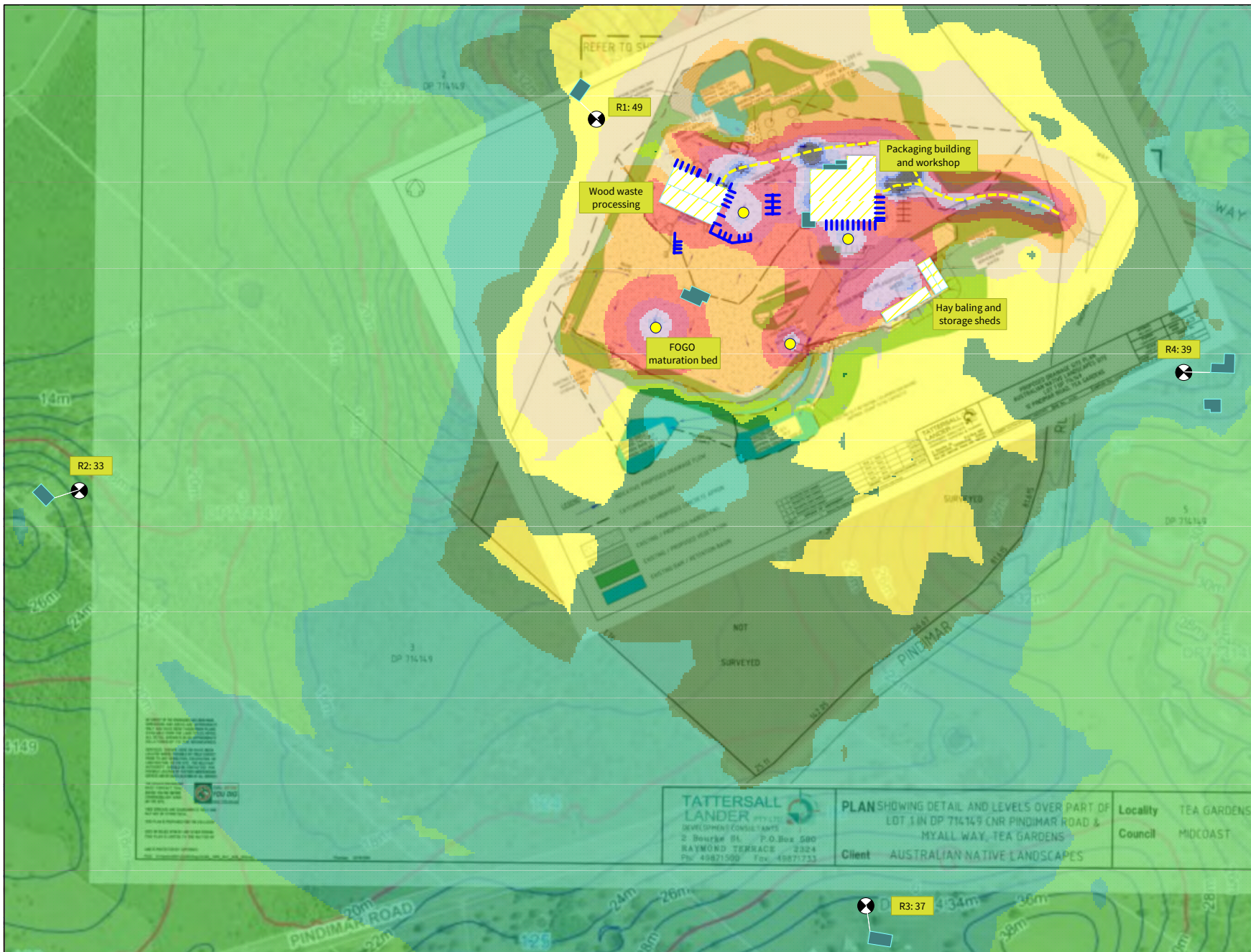
1. Noise levels shown are LAFmax
2. Receivers at 1.5 m above ground.
3. Noise contours at 1.5 m above ground.

PRINT DATE: 7.03.2024

VERSION: 5073 - SC3

- Point Source
- Line Source
- /// Area Source
- vert. Area Source
- Building
- Barrier
- Foliage
- Ground Absorption
- Contour Line
- ⊗ Receiver
- Calculation Area

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)



**Job number:** 5073  
**Client:** Australian Native Landscapes  
**Site address:** 12 Pindimar Road, Tea Gardens  
**Assessed to:** See acoustic report  
**Limiting criteria:** See acoustic report



## APPENDIX I – ODOUR AND DUST ASSESSMENT





THE ODOUR  
UNIT



# **Australian Native Landscapes Pty Ltd**

---

## **Proposed FOGO Processing Operation — Air Quality and Odour Impact Assessment**

---

**Lot 1/DP 714149, 12 Pindimar Road, Tea  
Gardens, New South Wales**

**Final Report**

**July 2024**



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**Project Number:** N2099-02

Report Revision		
Report Version	Date	Description
Draft Report 1.0	08.05.2024	Draft report issued for internal review
Draft Report 1.1	28.05.2024	Draft report issued to the Client
Final Report 1.2	06.06.2024	Final report issued to the Client
Final Report 1.3	15.07.2024	Updates made. Final report issued to the Client
Report Preparation		
<b>Report Prepared By:</b>		
		
Isaac Farrugia B.Eng (Chem) Consultant Engineer		
<b>Reviewed and Approved By:</b>		
		
Michael Assal MEngSc, B. Eng (Hon)/B.Sc, AMIChemE, MIEAust, CAQP Operations Manager		
<b>Report Title:</b>		
Proposed FOGO Processing Operation Air Quality and Odour Impact Assessment Report Lot 1/DP 714149, 12 Pindimar Road, Tea Gardens, New South Wales Final Report – July 2024		

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## LIST OF DEFINITIONS & ABBREVIATIONS

<b>AQOMP</b>	Air Quality & Odour Management Plan
<b>ANL</b>	Australian Native Landscapes Pty Ltd
<b>AQOIA</b>	odour and air quality assessment
<b>C:N</b>	Carbon-to-Nitrogen
<b>CEMP</b>	Construction Environmental Management Plan
<b>Composting Guidelines</b>	Department of Environment and Conservation (NSW) - <i>Environmental Guidelines – Composting and related organics processing facilities</i> , dated 2004
<b>DPE</b>	Department of Planning and Environment
<b>EBRT</b>	empty bed residence time
<b>EPL</b>	environment protection licence
<b>FOGO</b>	food organics and garden organics
<b>LGA</b>	Local Government Area
<b>NSW EPA</b>	Environment Protection Authority
<b>NSW EPA Technical F &amp; N</b>	NSW EPA document titled <i>Technical Framework (and notes): Assessment and management of odour from stationary sources. Sydney: Department of Environment and Conservation</i> , dated 2006
<b>OCS</b>	odour control system
<b>SEARs</b>	Planning Secretary's Environmental Assessment Requirements
<b>Tea Gardens Facility</b>	Lot 1/DP 714149, 12 Pindimar Road, Tea Gardens, New South Wales (the Tea Gardens Facility)
<b>TOU</b>	The Odour Unit
<b>VSD</b>	variable speed drive

## UNITS OF MEASUREMENT

<b>km</b>	kilometres
<b>kPa</b>	kilopascals

m	metres
m <sup>2</sup>	square metres
m <sup>3</sup>	cubic metres
ou	odour units
tpa	tonnes per annum

---

# 1 INTRODUCTION

---

The Odour Unit (**TOU**) was engaged by Australian Native Landscapes Pty Ltd (**ANL**) to undertake an air quality and odour impact assessment (**AQOIA**) for the proposed food organics and garden organics (**FOGO**) processing operation at Lot 1/DP 714149, 12 Pindimar Road, Tea Gardens, New South Wales (the **Tea Gardens Facility**). The following report documents the outcomes of the AQOIA.

## 1.1 RELEVANT BACKGROUND & CONTEXT

TOU understands that there is intent to transition the Tea Gardens Facility to obtain development consent to repurpose the existing landscape supply and wood chipping facility to receive and compost 50,000 tonnes per annum (**tpa**) of FOGO. To that end, the AQOIA is intended to address the air quality requirements of the Planning Secretary's Environmental Assessment Requirements (**SEARs**) Number 1841, as shown in **Figure 1.1**.

air quality – including:

- a description of all potential sources of air and odour emissions during construction and operation
- 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.

**Figure 1.1** – Air quality requirements for SEARs Number 1841

## 1.2 ASSESSMENT APPROACH

The AQOIA approach is based on air quality and odour operational review in the context of the impact risk potential of the existing and the proposed transition to FOGO at the Tea Gardens Facility. This review consists of identifying and characterising the manner in which FOGO will be received, managed, and processed to provide a site-specific analysis of the associated air quality and odour impact risks. By understanding the air quality and odour impact risks of the existing and proposed activities, all reasonable and practicable steps to eliminate or minimise those risks can be identified and characterised.

### 1.2.1 Relevant Guideline Documents

Where applicable, the AQOIA has adopted the relevant guidance provided in the following documents as published by the New South Wales Environment Protection Authority (**NSW EPA**) and the Department of Planning and Environment (**DPE**):

- NSW EPA document titled *Technical Framework (and notes): Assessment and management of odour from stationary sources*. Sydney: Department of Environment and Conservation dated 2006 (**NSW EPA Technical F & N**); and

- Department of Environment and Conservation (NSW) - *Environmental Guidelines – Composting and related organics processing facilities* dated 2004 (the **Composting Guidelines**).

To that end, the AQOIA is based on a risk-based assessment approach that seeks to minimise the future air quality impact and odour nuisance from the proposed FOGO transition rather than compliance with a defined standard or criteria, given that the Tea Gardens Facility is seeking to repurpose its existing landscape supply and wood chipping facility. As such, the AQOIA outlines all reasonable and practical measures to mitigate future air quality and odour risks from the Tea Gardens Facility for the proposed FOGO processing operation. This approach is consistent with the NSW EPA Technical F & N objectives and *Section 129* of the *Protection of the Environment Operations Act 1997*.



## 2 OPERATIONAL PROCESS OVERVIEW AND EMISSIONS ANALYSIS

### 2.1 SITE LOCALITY AND CONTEXT

The Tea Gardens Facility is located approximately 5.5 kilometres (km) southeast of the village of Tea Gardens and within the Mid Coast Council Local Government Area (LGA). The location of the Tea Gardens Facility from a regional context is shown in **Figure 1.1**.



**Figure 2.1** – An aerial map of the Tea Gardens Facility (Accessed on 8 May 2024 via Six Maps)

### 2.2 OPERATIONAL OVERVIEW

The Tea Gardens Facility currently operates in accordance with development application (DA) 3264/1988, DA 227/2015, and DA-9/2021. TOU understands that DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the approved wood waste processing building.

#### 2.2.1 Proposed FOGO Processing Operations Overview

The proposed FOGO processing operations application seeks approval of a new DA to process up to 50,000 tpa of FOGO within the existing approved wood processing building authorised under DA-9/2021. The Tea Gardens Facility is currently approved to accept and process 150,000 tpa of forestry residues, urban wood residues, and non-putrescible organics. It is proposed that this approved wood processing building be repurposed and retrofitted to operate the FOGO composting operations within this building. The proposed FOGO processing operations will not extend outside of the existing approved disturbance footprint and will be fully contained within Lot 1 DP714149. A series of layout drawings for the existing approved wood processing

building at the Tea Gardens Facility is shown in **Figure 2.1**, **Figure 2.2**, **Figure 2.3**, **Figure 2.4**, **Figure 2.5**, and **Figure 2.6**.

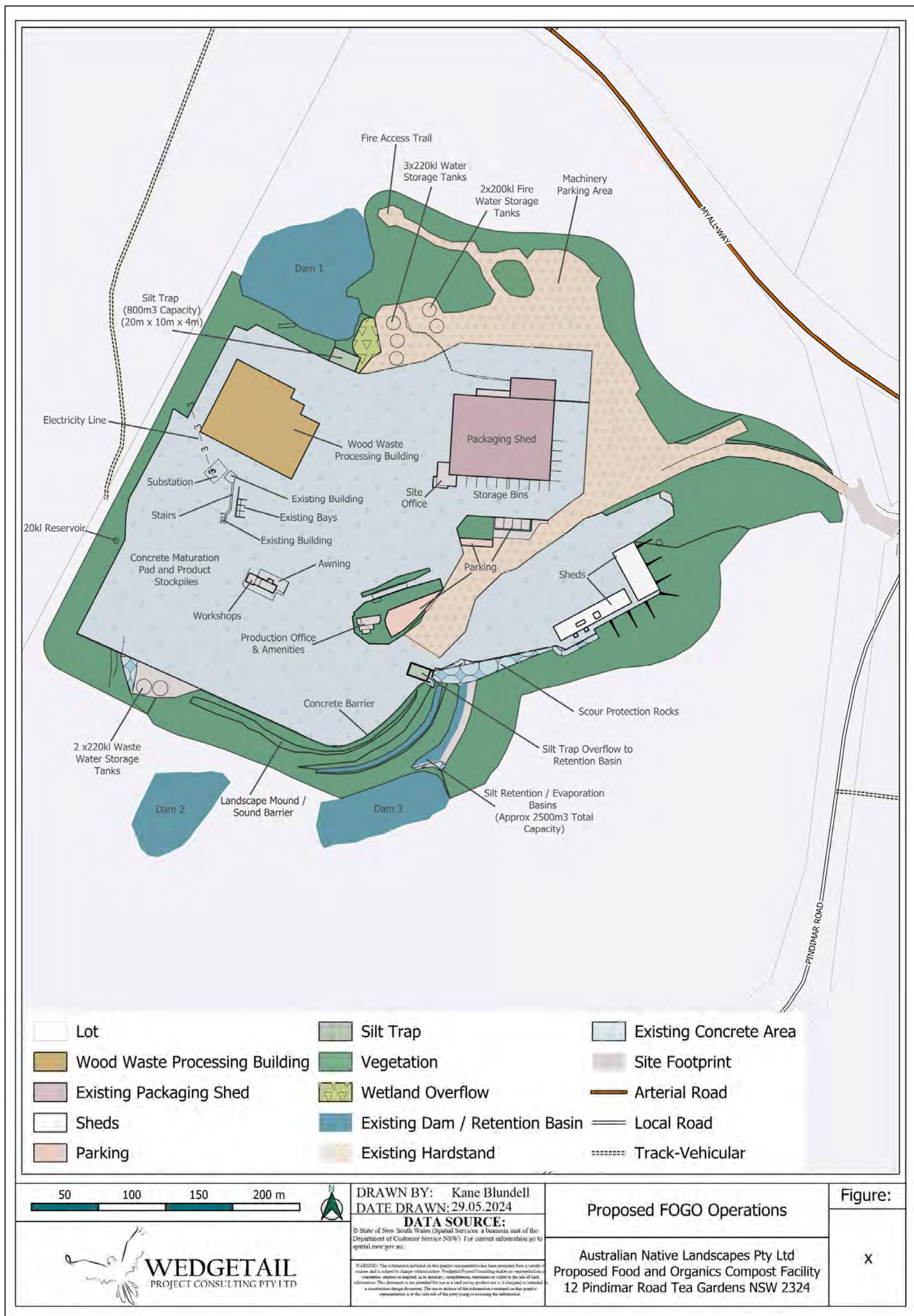
The Tea Gardens Facility is seeking to receive and compost 50,000 tpa of FOGO within an existing approved wood waste processing building onsite. TOU understands that 50,000 tpa FOGO operation would form part of the existing NSW EPA volume of 150,000 tpa under Category 1 organics as defined in Environment Protection Licence (EPL) 3877. Therefore, under this volume processing configuration, there will be no increase in the amount of material to be received and processed at the Tea Garden Facility, with only the types of materials approved to be received altered.

Furthermore, TOU also understands that the proposed FOGO processing operation does not require any changes to the existing approved shed as the building has been previously designed and approved to undertake composting of wood and vegetative waste and seeks only to include 50,000 tpa of FOGO as an alternative feedstock.

### **2.3 RELEVANT AIR POLLUTANTS ANALYSIS**

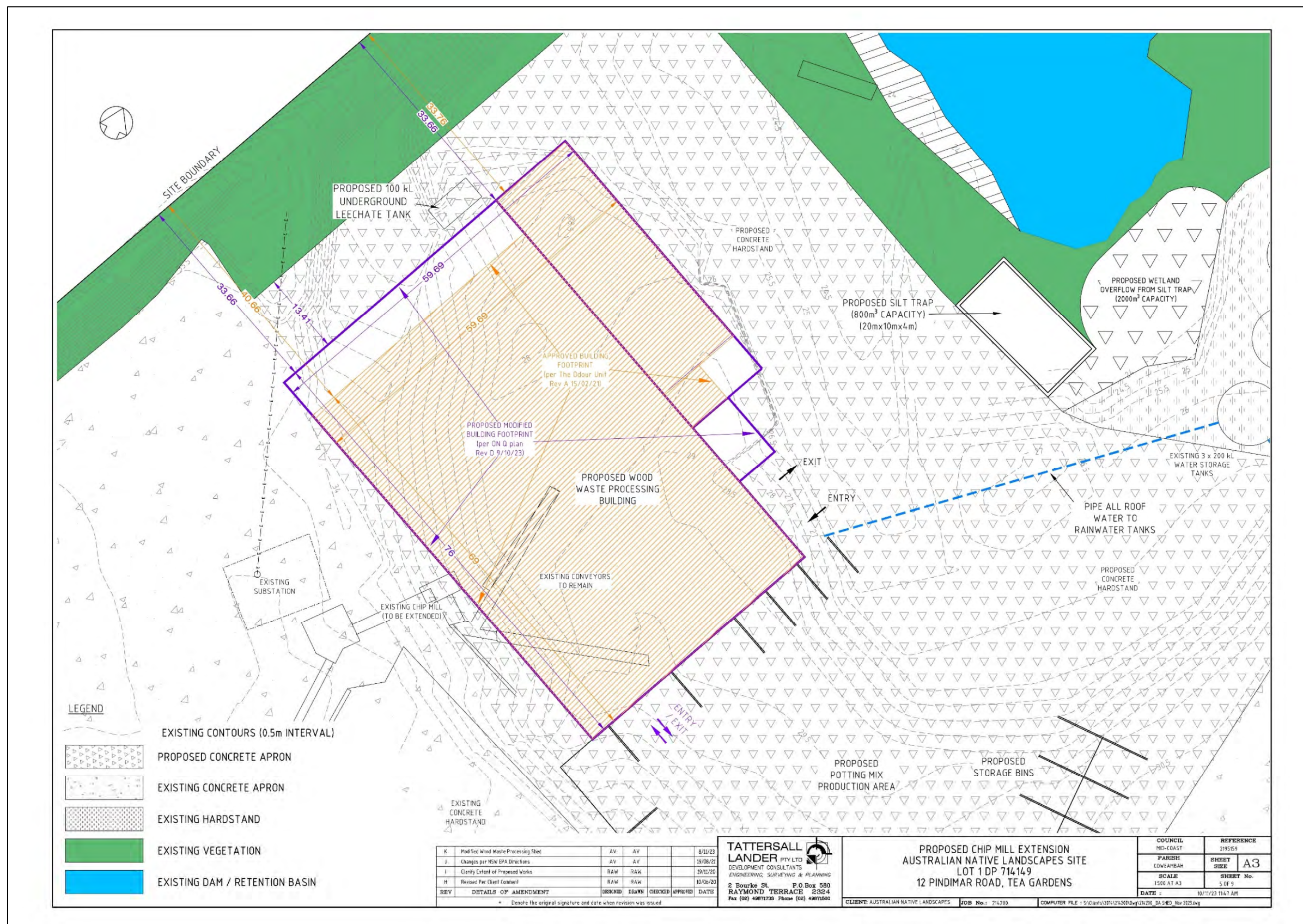
Based on the operational analysis documented in **Section 2.2.1**, the relevant air contaminants for the proposed FOGO processing operation are odour and dust to a significantly less extent.





**Figure 2.2 – A layout plan of the proposed FOGO processing operation at the Tea Gardens Facility**





**Figure 2.3** – A general overview of the proposed FOGO processing operation within the approved wood waste processing building at the Tea Gardens Facility





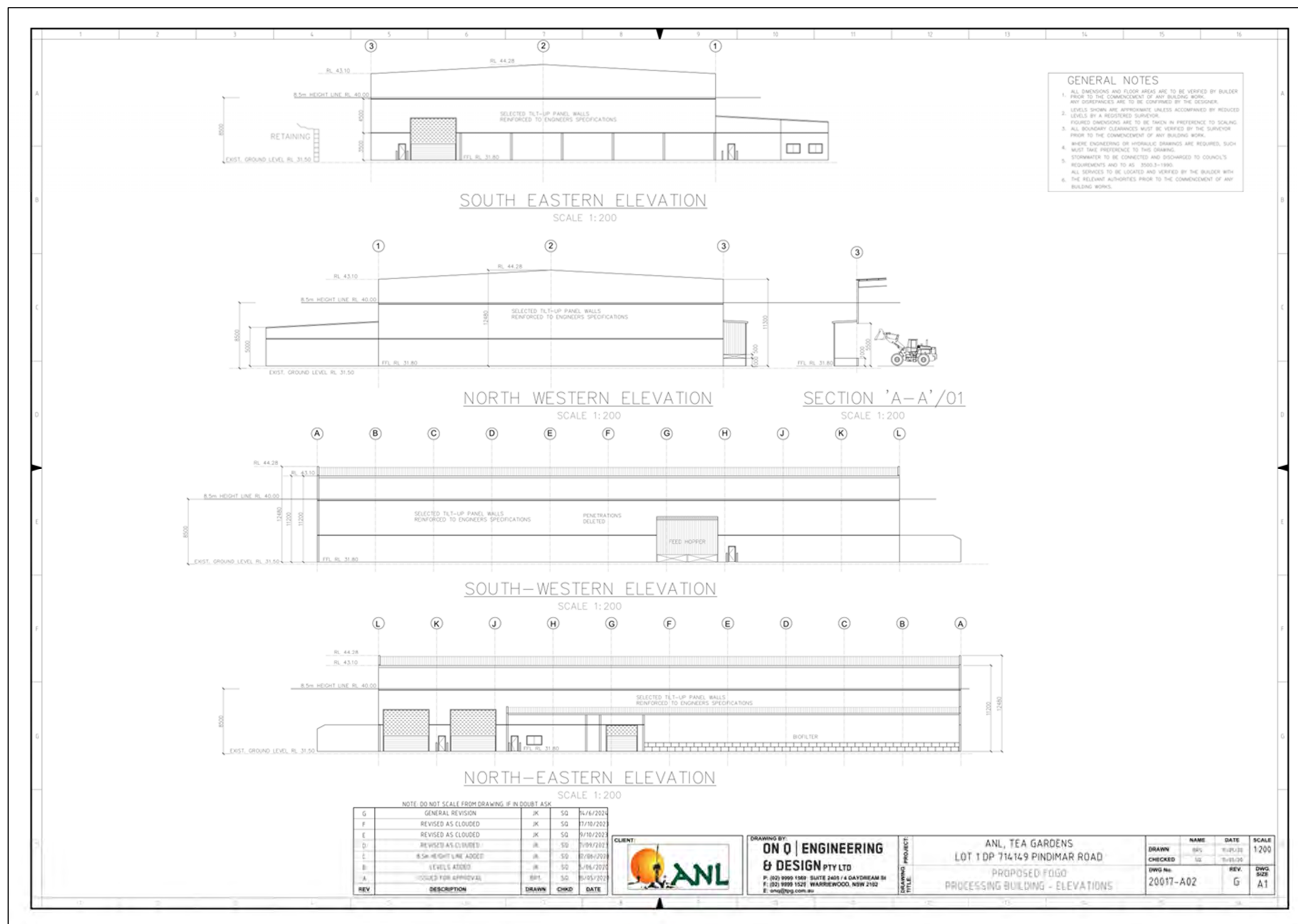
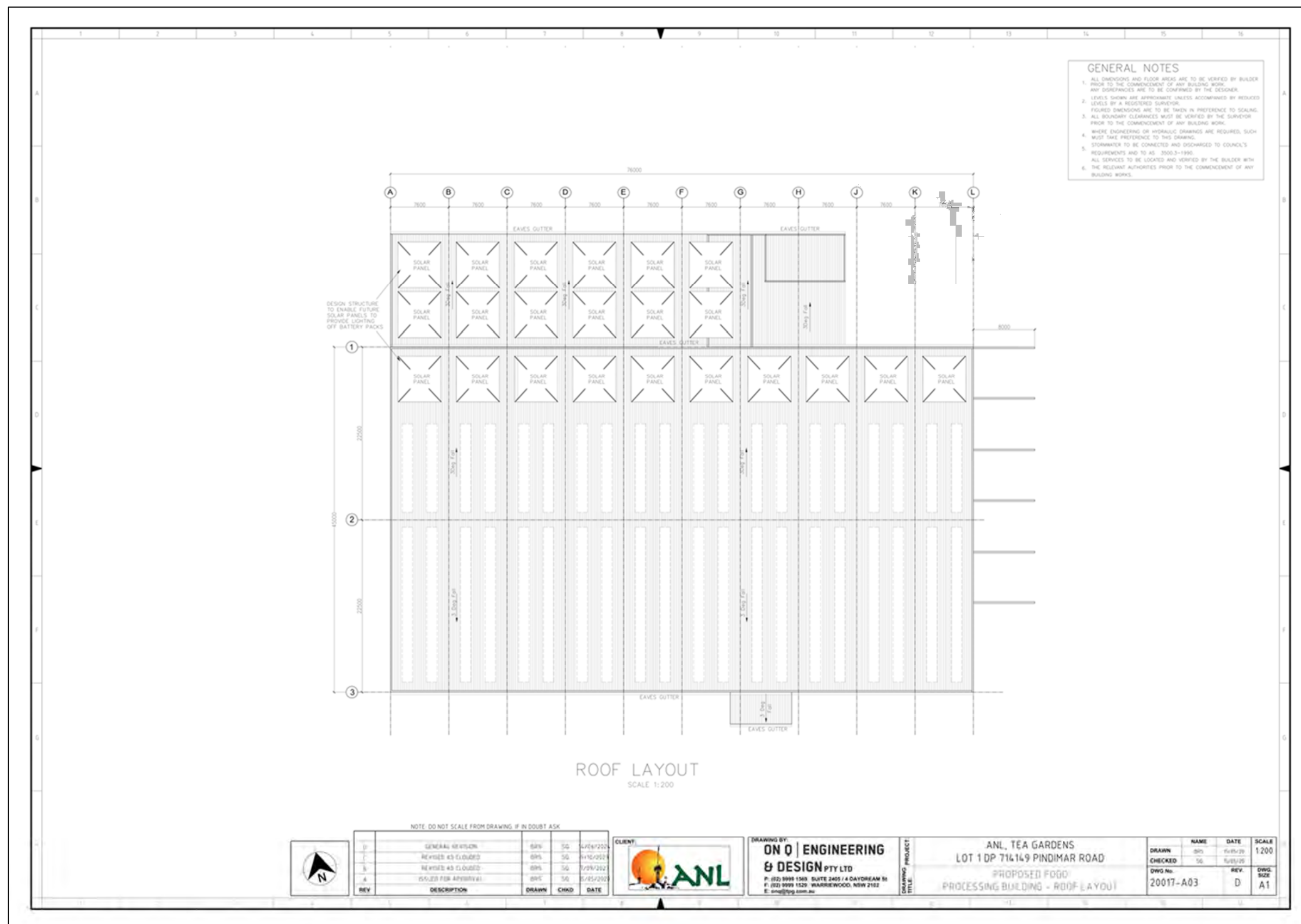


Figure 2.5 – Elevation plan for the proposed extension of approved wood waste processing building for the FOGO processing operation transition at the Tea Gardens Facility





**Figure 2.6 – Roof layout for the proposed extension of approved wood waste processing building for the FOGO processing operation transition at the Tea Gardens Facility**

---

### 3 PROPOSED FOGO COMPOSTING AIR EMISSIONS CONTROL PROTOCOL

---

The operational management protocol for the proposed FOGO processing operation at the Tea Gardens Facility is based on the following components:

- The operations and how the production and migration of odorous compounds will be managed and minimised;
- The monitoring and control protocols that will be employed to assist in the management of odour;
- Design information for the future odour control system (**OCS**); and
- High-level details on the management and monitoring procedures for the OCS to ensure that it is operated effectively.

#### 3.1 FOGO RECEIVAL PROCESSING PATHWAYS

The proposed FOGO processing operation will be designed for the receipt processing and composting of feedstock within two (2) key areas, as follows:

- FOGO waste will be received, stored, and processed within two (2) hours of receipt and placed onto the AeroSorb ® Aeration Composting System with the existing approved wood processing building; or
- FOGO waste received and stored that is not able to be processed within two (2) hours of receipt will be held in a dedicated FOGO buffer storage area within the existing approved wood processing building for up to twenty-four (24) hours and processed thereafter onto the AeroSorb Aeration Composting System.

#### 3.2 FOGO COMPOSTING PROCESS GENERAL OVERVIEW

Composting is the biological decomposition of biodegradable solid waste under controlled predominantly aerobic conditions (i.e. in a free oxygen favourable environment) to a state that is sufficiently stable for nuisance-free storage and handling and is satisfactorily matured for safe use in agriculture. The process is facilitated by a diverse range of micro-organisms, including bacteria, yeasts, fungi and actinomycetes living in aerobic conditions and is dependent on a number of factors, including.

- Waste type;
- Carbon availability;
- Carbon-to-Nitrogen (**C:N**) ratio;
- Temperature;
- Aeration rate;

- Pile size;
- Moisture content;
- pH; and
- Percent and type of bulking material utilised.

All the above factors, alone or combined, can have a significant impact on the composting process, odour emission generation potential, and final compost product quality. In general terms, an optimised composting process typically involves fully aerobic conditions, optimum C:N ratios and minimal turning of the stockpiles. However, it is acknowledged that composting facilities can have alternative optimisation strategies in place. Ultimately, the experience of the Tea Gardens Facility will play a key role in the success of the composting process and the quality of the end product. This will be critical as part of the active phase composting process within the 14-to-28-day processing period completed in the existing approved wood building at the Tea Gardens Facility (refer to **Section 3.3** for details).

### 3.3 PROPOSED FOGO PROCESSING OPERATION OVERVIEW

As shown in **Figure 2.3** and **Figure 2.4**, the existing approved wood waste building will be repurposed and utilised for the receipt and composting of FOGO. This is a rural building design measuring 45 m (length) x 76 m (width) x 8.5 m (height). It will continue to be used for the purpose of processing FOGO and non-putrescible vegetative waste from agricultural, silviculture or horticulture. These types of wastes are defined in the Composting Guidelines, namely *Categorisation of Organics – Category 1 & Category 2*.

While the Composting Guidelines permit the processing of these organics external of a building, TOU understands that the proposed FOGO processing operation will fully enclose the active phase composting phase at the Tea Gardens Facility. The primary driver for this is to enhance the ability to utilise more process leachate and stormwater in the operations.

The existing approved wood waste building will be repurposed to be capable of receiving up to 50,000 tpa of FOGO. This material will be shredded in a slow-speed shredder and placed onto the AeroSorb Aeration Composting System, where the active phase composting will occur over 14 to 28-day days. The shredded composting material will be turned on the Aero-Sorb Platform three (3) times in the active phase composting phase, achieving pasteurisation prior to removal from the existing approved wood waste building where it will be added to the existing composting system and undergo further maturation, blending, screening and conversion to a large range of horticultural and agricultural finished products.

ANL has used the Aero-Sorb Platform technology at several of its facilities. For the proposed installation at the Tea Gardens Facility, the existing approved wood waste building will be placed on an aerated-floor slab where it will be aerated by a series of underfloor aeration pipes, fed by two (2) aeration fans. The system will vent air through the surface of the material into the air space within the existing approved wood waste

building. As such, given that the entire air space will be ventilated to the external biofilter-based OCS, fugitive odour and dust emission releases from the existing approved wood waste building will be controlled and adequately mitigated to the extent that off-site impact will be very unlikely.

### 3.4 ODOUR CONTROL SYSTEM CONCEPT

The existing approved wood waste building at the Tea Gardens Facility will utilise a purpose-built biofilter-based OCS that will treat all significant odour emissions generated from within this building. The OCS design specification has been developed by TOU and will consist of the following key components:

- A mechanical building ventilation air extraction system that will provide a controlled internal building airspace environment to support the active phase composting operations;
- A fan system that delivers extracted building ventilation air to the biofilter system for treatment prior to atmospheric release;
- A biofilter system that is located immediately adjacent to the existing approved wood waste building. The biofilter system will have an empty bed residence time (**EBRT**) of at least 36 seconds;
- Maintaining negative pressure within the existing approved wood waste building with the doors closed;
- Interlocking high-speed roller doors to prevent both doors from opening at the same time;
- Moisture control of the biofilter bed material; and
- All wetted parts will be made of 304 stainless steel given the corrosive nature of the active phase composting operations that will occur within the existing approved wood waste building.

A high-level concept design of the OCS is shown in **Figure 2.4**. The OCS at the Tea Gardens Facility will be designed to achieve an air exchange rate of approximately (4) air changes per hour, sufficient to achieve measurable negative pressure conditions, with all access doors closed. This approach represents industry best-practice for odour control for enclosed composting operations in Australia. The ventilation air (approximately 112,000 m<sup>3</sup>/hr) will be treated through the biofilter system. The building will be fitted with high-speed roller doors on each truck doorway to ensure minimal escape of fugitive odour emissions during truck entry and exit.

The OCS building ventilation airflow extraction will be supported by a total of fifteen (15) fixed louvers (2,500 mm x 750 mm, as shown in **Figure 3.1**) to promote a cross-flow through the internal building environment, moving fresh air supply from the eastern section to the western section of the building area. All building ventilation air will be collected via an overhead common header duct located under the ridge line of the

existing approved wood waste building. This common header duct will have a varying duct diameter of between 965 mm and 1,372 mm, subject to the outcomes from the detailed design process.

### 3.4.1 Biofilter Humidification Concept

The collected airstream will be humidified prior to biofiltration. Humidification of the air is required to ensure sustainable biofilter performance. Poor humidification results in uneven and potentially dry patches in the biofilter medium, and incomplete odour removal. Humidification will be achieved through the inclusion of an in-duct water spray system. The biofilter system has been proven to be an effective OCS across a wide range of industries both in Australia and overseas.

### 3.4.2 Wet Weather Biofilter Management Protocol

The biofilter system will be protected from heavy rain events by the inclusion of a roof covering the biofilter cell surface area. The roof will further house solar panels that provide power to the Tea Gardens Facility, as shown in **Figure 2.6**. The biofilter fan, located adjacent to the biofilter on the western side of the building as shown in **Figure 2.4**, will draw air from the common header duct and direct the combined airstream to the biofilter system located on the northern side of the existing approved wood waste building.

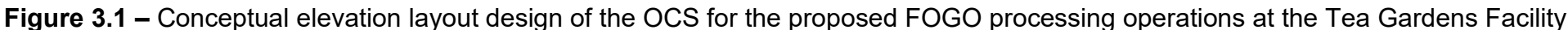
### 3.4.3 Biofilter Fan Specifications

The biofilter fan specifications for the OCS that will be augmented to the existing approved wood waste building as part of the FOGO processing operation at the Tea Gardens Facility will be as follows:

Fan Type:	Centrifugal
Materials:	All wetted parts in 304 stainless steel
Capacity:	112,000 m <sup>3</sup> /hr
Pressure Duty:	3.0 kPa
Speed Control:	Variable speed drive ( <b>VSD</b> )

The actual initial airflows will be restricted to 112,000 m<sup>3</sup>/hr at the expected initial low biofilter back-pressure (less than 0.5 kPa) by the use of the VSD. The suction pressure losses into the fan are expected to be in the range 0.7-1.0 kPa. The VSD will ensure that full design airflows can be achieved right up to the end of the life of the biofilter medium, when the biofilter back-pressure can increase to 2.0 kPa. It will also result in power savings.







### 3.4.4 OCS Ducting

The internal ducting system will consist of a common header duct running the length of the building, under the ridge line. It will draw air preferentially from the headspace above the Aero-Sorb Platform. All ducting will be made of 304 stainless steel. The building will be fitted with inlet air louvres, sized to provide some resistance to inlet airflow such that negative pressure inside the building is achievable. These louvres will be located along the eastern section of the building, as shown in **Figure 3.1**.

The biofilter location and layout are shown in **Figure 2.4**, which is based a TOU designed biofilter system. The biofilter shape has been selected to suit the available area at the rear of the existing approved wood waste building. The design consists of multiple cells feeding off a longitudinal air distribution chamber. The proposed layout enables the biofilter fan and humidifier to be sited adjacent to the rear of the building, with sufficient access for maintenance and loading/replacement of the biofilter medium from the northern end of the biofilter system.

A concrete biofilter design with a removable interlocking block wall fitted with an internal impermeable membrane is proposed at the Tea Gardens Facility. The interlocking block wall design has the benefit of allowing easy access to biofilter medium loading and replacement. In all other respects, the proposed design incorporates all the key design features associated with TOU biofilters including a full plenum floor air distribution system, a concrete air inlet distribution header duct/chamber, a free-draining robust medium, and pre-humidification of the entire foul air stream. TOU has successfully commissioned many biofilters with this design in Australia over the past two (2) decades.

### 3.4.5 Biofilter System Design Specifications

A total biofilter bed area of approximately 564 square metres ( $\text{m}^2$ ) is proposed for the biofilter, with a bed depth of 2.0 metres ( $\text{m}$ ). While the layout depicted in **Figure 2.4** may differ as a consequence of the detailed engineering design process, the total bed treatment capacity will remain unchanged.

The biofilter system will consist of two (2) discrete biofilter cells, each capable of treating 56,000  $\text{m}^3/\text{hr}$  of building ventilation airflow. Each biofilter cell will also consist of a concrete distribution chamber and a plenum cavity, with airflow directed to the plenum cavity from the distribution chamber via a series of inlet air penetrations. Each biofilter cell will consist of a 965 mm feeder duct connected to the concrete distribution chamber. This configuration enables a single biofilter cell to be isolated for short periods of time to enable the completion of any required maintenance works.

The design airflow and the biofilter area and depth will result in industry-accepted design loadings for biofilters operating within the composting industry. These loadings are also consistent with TOU design standards and will ensure good sustainable performance at the Tea Gardens Facility.

The medium selected for the biofilter will be a proprietary TOU medium comprising predominantly of bark and shredded wood. The medium will be free-draining and have

a relatively low-pressure drop of around 0.2 kilopascals (**kPa**) initially, rising to 2 kPa towards the end of its useful life. This low operating pressure, compared to other commonly used biofilter media, will result in lower energy consumption.

The biofilter will operate optimally at an air inlet maximum temperature up to 40°C. Higher temperatures can be accommodated but will result in a shorter life of the biofilter medium. For this application high temperatures are not expected to occur, given that the primary composition of the inlet airstream to the biofilter system is ventilation air from the existing approved wood waste building.

### **3.5 AIR QUALITY AND ODOUR ANALYSIS AND FINDINGS**

As documented in **Section 3.4**, the proposed FOGO composting operations at the Tea Gardens Facility will be conducted within a controlled building environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practice and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable.

The biofilter will be designed to remove the bulk, if not all, of the original odour character in the foul air stream. As such, the odour level in the treated air will mostly depend on the extent of the 'earthy/musty' odour picked up from the composting biofilter medium. TOU's experience is that a 'biofilter' odour is never problematical, even at these levels.

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## 4 CONCLUDING REMARKS

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In summary, based on the analysis and findings documented in the AQOIA, the following remarks are made in the context of the proposed FOGO processing operation at the Tea Gardens Facility:

- The active phase composting of the FOGO processing will be conducted in a controlled environment, with all process and building ventilation air extracted and treated via a biofilter system prior to atmospheric release. This air emissions control protocol and technology is consistent with current industry best practice and the Composting Guidelines and significantly mitigates odour and dust emissions as far as reasonably practicable;
- The AQOIA has considered the impact of transitioning to 50,000 tpa of FOGO and the existing approved wood waste building. Given that an OCS will be retrofitted to the existing approved wood waste building, the proposed infrastructure configuration and established waste management operations are adequate to effectively manage any future odour generation risk from the proposed FOGO processing operations;
- The proposed containment of the active phase composting within the existing approved wood waste building and covering of the biofilter system is anticipated to result in further mitigating odour emissions through minimisation from ingress of rainfall on the maturation stockpile area, enhancing the management of moisture control during the active FOGO composting period, and minimise surface water and leachate generation from the active FOGO composting processing area;
- The proposed OCS to existing approved wood waste building for the active phase composting is commensurate with the expected gradual rate of the transition to FOGO over several years. The building design allows for effective containment and ventilation adjustments to address potential organic shifts in the FOGO waste stream due to evolving regulatory, community, and social factors in the future. The biofilter-based OCS will be suitable for all FOGO and organic waste processing scenarios in the long term; and
- The full enclosure and capture of FOGO composting emissions in the active phase offers a practical and reasonable pathway for a transition to FOGO that will maintain or possibly improve the amenity from an odour and dust emissions perspective compared to the existing operating conditions at the Tea Gardens Facility.

Overall, a negligible or net improvement in odour and dust emissions is expected at the Tea Gardens Facility compared to the current operations under the proposed FOGO processing operations. The transition to FOGO will not result in a change to the current licenced processing capacity at the Tea Gardens Facility and is not expected to result in an elevated odour and dust impact risk based on the assessed reduction measures adopted for the active FOGO composting phase. The adoption of a fully enclosed and

engineered environmental operating condition augmented with a purpose-built biofilter system for air emission treatment is reflective of best practice for the active phase of FOGO composting in Australia. This is on the basis that the FOGO is processed within the existing approved wood waste building for a minimum period of 14 days and up to 28 days, based on processing conditions.

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## 5 RECOMMENDATIONS

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Given the operational evaluation analysis and findings of the AQOIA, the following recommendations are made as part of proactive and prudent measures for the management of odour and dust emissions from the Tea Gardens Facility under the proposed FOGO transition operation:

- Development of a Construction Environmental Management Plan (**CEMP**) for any construction and demolition works required as part of the proposed FOGO transition (where applicable). A CEMP outlines actions that should be implemented to prevent, control, and mitigate environmental and human impacts associated with the any construction and demolition works. It also outlines protocols and policies for managing, monitoring, reporting, and responding to any potential environmental issues. As a minimum, the CEMP will need to consist of the reduction of airborne particles/dust emissions during construction and demolition works, dust suppression during dry weather, dust suppressants, windbreaks, covers, soil erosion, and other effective techniques to prevent and mitigate the generation and dispersion of dust as part of the proposed FOGO transition at the Tea Gardens Facility;
- Update the site-specific Air Quality & Odour Management Plan (**AQOMP**) to reflect the proposed FOGO processing operations at the Tea Gardens Facility. As a minimum, the updated AQOMP should document the hierarchy of controls in the form of, but not limited to, engineered, administration, and/or management practices, under the proposed FOGO transition, including:
  - Identification of critical air quality and odour emissions risk and control points;
  - An outline of how the production and migration of air pollutants (such as odour and dust) is minimised at the Tea Gardens Facility, including design (where applicable) and operational practices;
  - Standard operating procedures, equipment, material of construction, and management practices employed within the Tea Gardens Facility to anticipate the formation of odours and minimise their release;
  - An outline of the key staff and responsibilities with respect to air quality and odour management;
  - An outline of the reporting requirements with respect to air quality and odour;
  - The operation and maintenance of the biofilter-based OCS including the monitoring of humidity, pressure and temperature; and

- An outline of future odour and dust strategies, as part of a long-term trigger action and response plan.
- Undertake a site-specific odour and dust validation assessment following the transition and commencement of FOGO processing at the Tea Gardens Facility to ensure the outcomes align with that documented in the AQOIA. This can be used as a basis for further mitigation and management measures and determine the activation of any future requirements for an update or change in the management practices and protocols adopted at the maturation pad under the proposed FOGO processing operation. The site-specific odour and dust validation assessment should include the following components:
  - **Validation Phase 1** (Pre-FOGO): Conduct a baseline odour assessment pre-FOGO transition to characterise current operation condition.
  - **Validation Phase 2** (Post-FOGO with OCS): Conduct an odour emissions control assessment with the Tea Gardens Facility operating with FOGO and the purpose-built OCS. Validation Phase 2 will also conduct a comparison of the outcomes from the previous validation phase as a basis to determine if further mitigation measures and controls are required.
  - All sampling and testing protocols adopted as part of Validation Phase 1 to Validation Phase 2 should consider all relevant standard and guidelines as follows:
    - ❖ NSW EPA titled *Approved methods for the sampling and analysis of air pollutants in NSW* dated January 2021;
    - ❖ Australian Standard/New Zealand Standard 4323.3 ;
    - ❖ Australian Standard/New Zealand Standard 4323.4; and
    - ❖ Odour laboratory analysis at a NATA Accredited Laboratory.





## APPENDIX J – SOIL, WATER AND LEACHATE MANAGEMENT



# WATER SENSITIVE DESIGN STRATEGY

for

PROPOSED WORKSHOP EXTENSION,  
WOOD WASTE PROCESSING  
EXTENSION, PACKAGING SHED, SILT  
TRAP, STORAGE TANKS & ASSOCIATED  
WORKS

**12 PINDIMAR ROAD  
TEA GARDENS  
(LOT 1 in DP 714149)**

*Prepared by*  
**TATTERSALL LANDER  
PTY LTD**

*Development Consultants*  
**April 2024**

DEVELOPMENT CONSULTANTS IN ENGINEERING, SURVEYING, PLANNING & ENVIRONMENTAL



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## **1.0 INTRODUCTION**

This report has been prepared to support an application to change the internal usage of an approved (but not yet constructed) waste processing shed on the existing ANL site at 12 Pindimar Road, Tea Gardens. The existing approvals permit processing of wood waste inside the shed, and this application requests approval to modify the use of this shed to include up to 50,000 tonnes per annum of mixed Food and Garden Organics (FOGO).



**Figure 1: Locality Diagram**

This report has been prepared generally following the structure described in the Water Quality section of the MidCoast (Great Lakes) Council Development Control Plan (D.C.P.), and is a revision on Tattersall Lander's previous Water Sensitive Design Strategy (October 2021) prepared as part of the DA9/2021 application. It has been updated to reflect changes to internal water usage rates as a result of this current application, as well as a minor change to the shed's roof area as a result of the separate modification application. There are also some additions to address various requests listed in the SEARs issued for this application.



## **2.0 BACKGROUND INFORMATION**

Australian Native Landscapes Pty Ltd operates this site under the Environment Protection Licence 3877 (known as ‘the licence’). The existing wood chip mill and associated workshop facilities on the site currently operate under a design scenario in which no stormwater runoff leaves disturbed sections of the site under normal operating and weather conditions. Runoff is collected and stored onsite in three (3) dams in order to comply with Condition L1.1 of the licence by the prohibition of pollution of waters. The stored water is used for a variety of purposes including consumption in onsite industrial processes, dust suppression and wetting down of material stockpiles in accordance with Condition O3.1 of the licence. Storage levels onsite are actively managed, and excess water not used for these purposes is utilised for onsite irrigation, in order to maintain dam storage capacity and limit site discharges.

Refer to Appendix A for a copy of the Environment Protection Licence (EPL) 3877. Refer also to Appendix B and Appendix C for compliance letters from the NSW Environment Protection Authority (EPA) regarding dust, litter and pollution incidence responses.

In 2022 MidCoast Council approved DA9/2021, allowing for the construction and operation of several additional buildings on the site including the waste processing shed that is subject to this application.

In 2023 an application was made to Council (MOD2023/0270) for a modification to DA9/2021 to slightly change the shape and size of the waste processing shed in question. That application is currently under assessment at Council, and is not directly linked to the application this report relates to – this report relates only to an application to change the internal use within that shed.

### **3.0 SITE CONTEXT AND DESCRIPTION**

#### **3.1 GENERAL**

The subject site has frontage to both Myall Way and Pindimar Road, with the access point coming off Pindimar Road. It currently hosts an approved landscape supply facility, including several buildings, large concrete and gravel hardstand areas, stockpiling areas, access and operating roadways and other associated infrastructure. The footprint of this operations area is generally well set back from both frontages, and well screened from these roads by both vegetation and landform.

The site is zoned RU2, as are all neighbouring properties, and it is approximately 2.5km from the Pacific Highway and 5.5km from the town of Tea Gardens.

The current application is situated within the footprint of the existing operations area, and there will be no changes to any site conditions outside of the proposed FOGO shed.

#### **3.2 GEOLOGICAL**

The Soil Landscapes of Port Stephens 1:100 000 indicates that two soil landscapes the Pindimar Road (pr) and the Nungra (ng) were present within the study area. The Pindimar Road (pr) soils cover the northern two-thirds of the study area including the operational area where the subject of this application is located, and is “characterised by undulating to rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wooton Beds”.

Previous geotechnical reports at conducted on the site also indicate that the existing soil subgrades are generally clays or silty clays overlying weathered sandstone and siltstone layers.

The eSPADE portal shows the soil type to be mapped as a Hydrologic Soil Group “C” – slow infiltration.

The site is not mapped as having any acid sulfate soil potential.

### 3.3 TOPOGRAPHICAL / CATCHMENTS

Review of LIDAR and site survey data shows that levels across the site range from around 38m AHD at the highest points (in both the north and eastern extents of the site), to around 15m AHD at the lowest point (in the south-west corner of the site). Natural slopes vary and typically range between 1-12%, and the operational area has been modified to be generally a maximum of 5% slope.

The shed subject to the current application will be situated within the footprint of the existing operations area, and will generally utilise the existing drainage and treatment measures (with some supplementation).

The operations area contains three catchments directing flow towards three dams located within the site. The shed subject to this application is located in Catchment 1. Figure 2 illustrates the currently approved development and catchments within the site.



**Figure 2: Current Catchment Diagram**



With regard to Catchment 1 where the subject shed is located, all surface overflow will collect in Dam 1. Roof water from the shed and existing workshop building is directed into the three (3) existing 220kL rainwater tanks for internal re-use on site. Water is also reused directly from Dam 1 to meet various operational demands.

With regard to Catchment 3, the runoff from the concrete surface and hardstand is firstly directed to an existing silt trap before discharging to Dam 3 where it is stored. Any run-off from within Catchment 2 and overflow from Dam 3 will collect in Dam 2 located to the west. Water is pumped from Dam 2 to two (2) adjacent existing 220kL storage tanks and an existing 20kL storage tank from which water is reused onsite.

## **4.0 PROPOSED DEVELOPMENT**

This current application is to change the internal use of the already approved waste processing building, to allow food waste to be processed instead of just using wood waste inputs. This change will also include upsizing the previously approved sub-surface storage tank associated with internal leachate management and internal runoff in a fire scenario, and an additional fire water storage tank.

There are no proposed changes to the other components approved under DA9/2021, which included;

- bulk earthworks,
- the construction of two (2) packaging sheds (approx. 60m x 12m & 40.5m x 18m),
- a workshop extension (approx. 15m x 33.3m),
- two (2) 200kL fire hydrant storage tanks,
- a 50kL storage tank,
- a 80kL underground storage tank,
- a silt trap (approx. 800kL), and
- a constructed wetland.

In accordance with NSW EPA directions, the existing DA approval requires roof water tank overflows to be diverted around the storage dams to discharge directly offsite. Comparatively, this increases the overall number and quantity of site discharges, but also reduces the number and quantity of discharges from the site leachate storage dams.

The approved site plan is included in Appendix E.

## **5.0 WATER SENSITIVE DESIGN OBJECTIVES**

### **5.1 WATER QUALITY TARGETS**

During the previous assessment of the site for DA9/2021, it was agreed with Council staff that application of a Neutral or Beneficial Effect criteria was the most relevant standard to apply to the water quality assessment.

For this current application, subjectively this is a fairly easy assessment to make – the proposed change of use does not result in any external changes on the site, so will not change the volume or pollutant concentrations in any surface runoff. Furthermore, the predicted increased usage rates will improve treatment train performance by diverting more captured water back into reuse and further reducing any site discharges. The MUSIC modelling completed in Section 9 of this report confirms this to be the case.



## **6.0 BEST PLANNING PRACTICES**

The site currently operates under a scenario whereby no stormwater runoff from the development footprint leaves the site under normal site conditions – see Figure 2. All runoff from the operations area is captured in storage ponds and tanks for reuse.

Run-off from developed areas is utilised on site for a range of purposes. With some of the site consisting of open gravel hardstand areas, water is required for dust suppression. Similarly, large amounts of processed material stockpiles are also exposed to the elements and are required to be wet down regularly to stop material being blown away in the wind. A large amount of water is also required for the wood waste processing extension. Any remaining run-off is to be used for irrigation purposes to ensure that no stormwater runoff will leave the site.

Detailed figures have been supplied by the site operator, which can be seen in Appendix E. The estimated reuse rates for the current, DA9/2021 approved, and proposed FOGO site configurations are presented below in Table 2-4.

In addition, the internal reuse provided in Table 2-4 is based upon the average toilet demand of 55L/day/dwelling according to MidCoast Council Guidelines for Water Sensitive Design Strategies (2019) with the assumption the site will demand four times that of a standard residential dwelling. It is noted that this is negligible in comparison to the other uses on the site.

**Table 1: Existing Water Reuse Estimates**

<b>Reuse</b>	<b>Non-weather dependant, modelled as daily demand (kL/day)</b>	<b>Weather dependant modelled as annual demand Distributed PET- rainfall (kL/yr)</b>
Dust Control		22,275
Mulch Colouring	16.44	
Landscape Irrigation		1,350
Potting Mix & Mulch Products		3,712
Existing Internal Reuse (toilet / shower)	0.22	
<b>TOTAL</b>	<b>16.66</b>	<b>27,337</b>

**Table 2: Approved DA9/2021 Proposed Water Reuse Estimates**

<b>Reuse</b>	<b>Non-weather dependant, modelled as daily demand (kL/day)</b>	<b>Weather dependant modelled as annual demand Distributed PET-rainfall (kL/yr)</b>
40,000 tonne Shredder	84.93	
Dust Control		29,700
Mulch Colouring	21.86	
Landscape Irrigation		1,350
Potting Mix & Mulch Products		4,937
Existing Internal Reuse (toilet / shower)	0.22	
<b>TOTAL</b>	107.01	35,987

**Table 3: Approved DA9/2021 + Proposed FOGO Water Reuse Estimates**

<b>Reuse</b>	<b>Non-weather dependant, modelled as daily demand (kL/day)</b>	<b>Weather dependant modelled as annual demand Distributed PET-rainfall (kL/yr)</b>
50,000 tonne Shredder	106.16	
Dust Control		29,700
Mulch Colouring	24.05	
Landscape Irrigation		1,350
Potting Mix & Mulch Products		5,430
Existing Internal Reuse (toilet / shower)	0.22	
<b>TOTAL</b>	130.43	36,480

## **7.0 FLOODPLAIN MANAGEMENT AND CATCHMENT FLOODING**

The site is located at the top of the catchment, with no external runoff flowing into the operational area. Surface runoff from the site would make its way initially via first and second order streams through adjacent private rural properties to Station Creek, then on to Bundabah Creek and eventually into North Arm Cove (Port Stephens), approximately 2.6km downstream.

While there are not existing specific detailed flood assessments for these waterways, the most relevant Council flood study is the Port Stephens Design Flood Levels Climate Change Review. This study found the 2100 100yr flood level at Bundabah (North Arm Cove) to be 2.7m AHD. With site levels starting at 15m AHD, and the shed subject to the current application being at 31.8m AHD, it is not expected that there will be any impacts on the application from local or regional flooding.

Similarly, with the application being simply for the change of internal use within an approved shed structure, there will be no downstream impacts on flooding as a result of this application.

## **8.0 INTEGRATED WATER CYCLE MANAGEMENT**

Due to its somewhat isolated location, the site currently operates without any connection to town water or sewer services.

The site is currently serviced with an 'enviro-cycle' sewer pump out arrangement, which is currently fit-for-purpose and will not be impacted by this application.

Water supply to both the existing and already approved buildings is via large capacity private tank water storages. Internal industrial processes on the site also utilise surface water runoff that is captured and stored in onsite dams. While this application will slightly increase reuse demand on these combined storage reserves, this is only an issue during extended dry periods where the facility actively monitors storage levels and manages operating capacity accordingly to avoid running out of supply.

## **9.0 STORMWATER RUNOFF WATER QUALITY MANAGEMENT**

### **9.1 BACKGROUND**

The quality of runoff generated by the site is important to ensure the preservation of the downstream environments, due to an increased proportion of impervious area leading to a subsequent increase in the quantities of phosphorus and nitrogen entering potential storm water runoff. It is important to note there is no exposed ponding of stormwater runoff (excepting in the storage dams) on the site due to the impermeable concrete hardstand and adequate cross fall directing stormwater runoff. The aim of this study was to determine what measures need to be undertaken as part of this development to meet water quality objectives.

While there are no proposed external changes as a result of this application and thus no impact on the quality or quantity of runoff, the application will marginally change water reuse rates on the site, so the impact of this change has been assessed by modifying this value in the previously accepted MUSIC modelling that supported DA9/2021. The description below summarises the construct of this modelling, as it was previously described in earlier versions of this report;

### **9.2 MUSIC MODELLING**

MUSIC is the Model for Urban Stormwater Improvement Conceptualisation, developed by the Cooperative Research Centre for Catchment Hydrology. MUSIC provides the ability to model both quality and quantity of runoff generated by catchments. Therefore MUSIC can simulate annual stormwater volumes, and expected annual pollutant loadings.

MUSIC is designed to model stormwater runoff systems in urban catchments. It is used to simulate a range of temporal and spatial scales. Catchment modelling can be performed for areas up to 100 km<sup>2</sup>, with times steps from 6 minutes to 24 hours to match the range of spatial scale. This enables long term modelling of continuous historical rainfall data from pluviograph sources, and reflects the ability to account for temporal variation in data for an annual rainfall series directly.

MUSIC also has the ability to model a number of treatment devices, and measure their effectiveness in terms of the quantity and quality of runoff downstream. This allows determination of the degree of reduction in annual pollutant loadings.

The MUSIC simulation relies heavily on input variables, but at small to medium scales of development it is usually unfeasible to undertake a model calibration. In these cases, various publications have been produced to provide recommended model inputs, including *NSW MUSIC Modelling Guidelines* (BMT WBM, 2015) and *Guidelines for Water Sensitive Design Strategies* (MidCoast Council, 2019).

### 9.2.1 CLIMATE / RAINFALL

To accurately model a site of this size, a continuous rainfall record spanning at least five years with a six minute timestep is required. MidCoast Council have supplied a template for use across the LGA and the modelling in this report utilises the Council template.

The rainfall record in the template is ten years of data between the dates of 1/1/1969 and 31/12/1978. This data produced a mean annual rainfall of 1234mm. For comparison, it is noted that the long term average rainfall (obtained from the Bureau of Meteorology) for Nelson Bay (approximately 11km from the site) is 1348mm.

### 9.2.2 EVAPORATION

To accurately model the outcome of water quality treatment measures, potential evapotranspiration (PET) data is required. Again, this data has been taken from the MidCoast Council template which has a mean annual value of 1367mm.

For comparison, it is noted that monthly average areal potential evapotranspiration values from maps in the 'Climate Atlas of Australia, Evapotranspiration' (BoM, 2001) resulted in an annual average of 1335mm.

### 9.2.3 NODE PARAMETERS

The MUSIC model was used to simulate the pollutant export generated during a ten year period of average rainfall. Sandy clay loam soils are present at the proposed development locations, and rainfall-runoff parameters for a “Group C” soil type were adopted from Table 4-2 of the MidCoast Council Guidelines for Water Sensitive Design Strategies (2019). A Rainfall Threshold of 5mm/day has been applied to areas of the site covered by stockpiles. This is considered conservative, and the operators report that they would not usually witness runoff from these stockpile areas unless extended or exceptionally heavy rainfall is experienced onsite. A value of 0.5 mm/day was adopted for “Roof” nodes and 1.5mm/day was adopted for all other nodes.

Typical pollutant concentrations have been derived from the NSW MUSIC Modelling Guidelines (2015). As requested by Council, the current version of this modelling has both unsealed and sealed road areas of the site modelled as an agricultural source node.

Rainfall-Runoff Parameters	
<b>Impervious Area Properties</b>	
Rainfall Threshold (mm/day)	1.50
<b>Pervious Area Properties</b>	
Soil Storage Capacity (mm)	100
Initial Storage (% of Capacity)	25
Field Capacity (mm)	70
Infiltration Capacity Coefficient - a	180.0
Infiltration Capacity Exponent - b	3.00
<b>Groundwater Properties</b>	
Initial Depth (mm)	10
Daily Recharge Rate (%)	25.00
Daily Baseflow Rate (%)	25.00
Daily Deep Seepage Rate (%)	0.00

**Figure 3: Adopted Rainfall-Runoff MUSIC Parameters**



**Table 4: Adopted MUSIC Pollutant Generation Parameters**

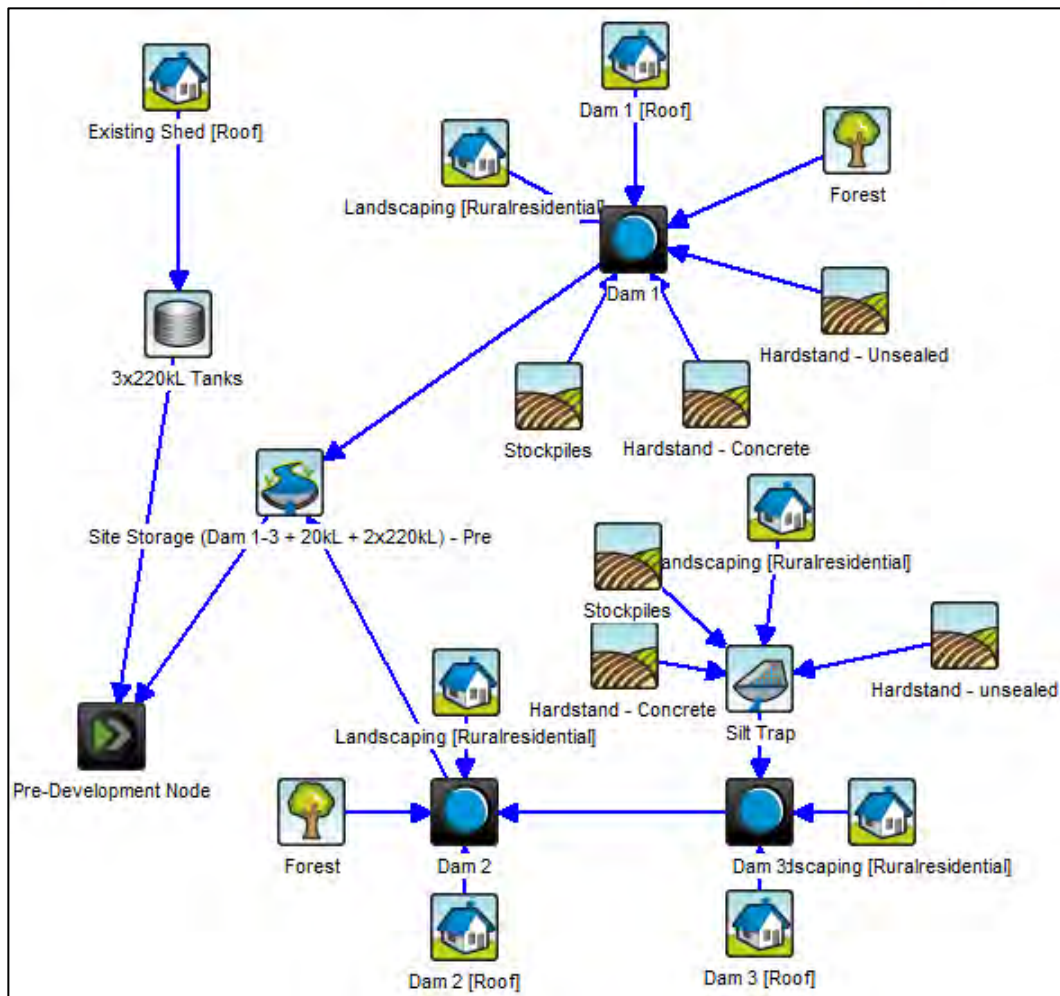
			<b>Forest</b>	<b>Rural Residential</b>	<b>Agricultural (Sealed/ Unsealed Road)</b>	<b>Roof</b>
<b>TSS</b>	Baseflow (mg/L-log <sub>10</sub> )	Mean	0.78	1.15	1.30	-
		SD	0.13	0.17	0.13	-
	Stormflow (mg/L-log <sub>10</sub> )	Mean	1.60	1.95	2.15	1.30
		SD	0.20	0.32	0.31	0.32
<b>TP</b>	Baseflow (mg/L-log <sub>10</sub> )	Mean	-1.22	-1.22	-1.05	-
		SD	0.13	0.19	0.13	-
	Stormflow (mg/L-log <sub>10</sub> )	Mean	-1.10	-0.66	-0.22	-0.89
		SD	0.22	0.25	0.30	0.25
<b>TN</b>	Baseflow (mg/L-log <sub>10</sub> )	Mean	-0.52	-0.05	0.04	-
		SD	0.13	0.12	0.13	-
	Stormflow (mg/L-log <sub>10</sub> )	Mean	-0.05	0.30	0.48	0.30
		SD	0.24	0.19	0.26	0.19

### 9.3 EXISTING SITE - ENTIRE CATCHMENT FLOW ANALYSIS

Given that the site upgrades under DA9/2021 and the current FOGO application sit within an already operating industrial site, the approach agreed previously with Council staff was that separate Existing Site and Proposed Site models should be prepared to enable better assessment of the impacts of the proposed development.

In each respective model, the site catchment areas have been broken up into different source nodes depending on their existing and future landuses, according to the NSW MUSIC Modelling Guidelines (2015). Gravel hardstand areas (unsealed roads) and concrete areas (sealed roads) have modelled as Agricultural landuse nodes, per previous Council direction. Landscaped areas and grassed open space are modelled as "Rural Residential". Areas of the site that are heavily vegetated are modelled as "Forest".

The MUSIC model was prepared to represent existing conditions on site. A catchment breakdown can be seen in Appendix D and the corresponding MUSIC model layout can be seen below. This model is unchanged from the previously submitted assessment for DA9/2021.



**Figure 4: Existing Site MUSIC Model**

Following previous discussions with Council, the site storage dams have been modelled as a “Pond” node within MUSIC, which allows permanent storage, infiltration losses and the onsite reuse to be modelled from a single node. Further, the Pond node assumes limited vegetation is provided in the dams, which is consistent with the existing site conditions.

Given the high usage rates required for site operations, additional water is stored in numerous storage tanks whenever it is available to ensure a security of supply to keep the plant operating. Water reuse onsite is actively managed and the operator draws down dam storages to fill numerous storage tanks and supply the site’s water demands.

Despite the large storages and reuse rates on the site, there will still occasionally be storm events large enough to cause dam overflows. It is an operational requirement of the site that a storage volume is available equal to the 10% AEP 24-hour storm.

Water is pumped to storage tanks and then to 'waste' on the site's landscaped areas if levels are getting too high, particularly in the lead up to forecast large rainfall events. These landscaped areas have been constructed as a series of swales and localised depressions that hold the water until it is absorbed / evaporated, ensuring no runoff escapes the area. To account for this additional draw-down, an additional reuse rate equivalent to 15x15kl water tanker loads per day (x 5.5 days/week x 45 weeks/yr = 55687kl/yr). The 45 weeks/yr is an allowance to reflect that these arrangements are typically not enacted on the wettest 5 weeks of the year, and also over the nominal two-week Christmas shutdown. Further this reuse rate has been distributed as "PET - rainfall" reflecting the fact that disposal of excess water is less likely on higher rainfall days. It was agreed with Council that this most accurately reflects the actual scenario on site.

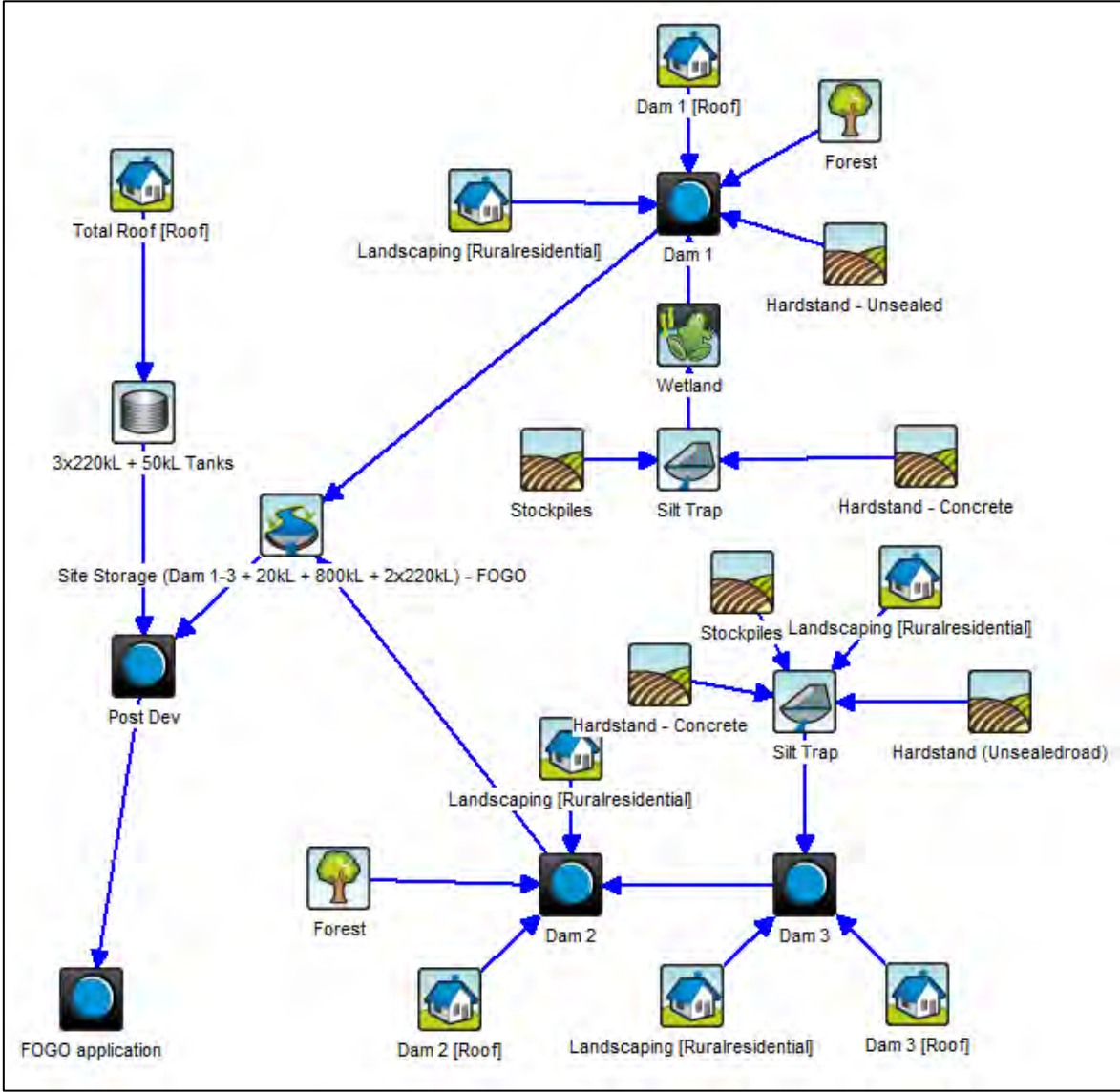
**Table 5: Existing Site Pollutant Loads**

	TSS	TP	TN	GP
Pre-Treatment (kg/yr)	14900	61.1	328	2340
Post-Treatment (kg/yr)	1040	5.81	62.8	0
Reduction (%)	93.0	90.5	80.9	100

#### **9.4 APPROVED DA9/2021 SITE - ENTIRE CATCHMENT FLOW ANALYSIS**

A second MUSIC model was prepared to represent the proposed development site conditions under DA9/2021. The main changes from the base existing site model include increased roof area and increased concrete hardstand area, along with a reduction in uncovered stockpile areas, unsealed hardstand, forest and landscaped areas. Treatment wise, there is an increase in storage volumes as well as an increase in the reuse demand.

A catchment breakdown can be seen in Appendix D and the corresponding MUSIC model layout can be seen below.



### Figure 5: Proposed Developed Site MUSIC Model

### Table 6: Modelled Pollutant Loads from Proposed Development Site

	TSS	TP	TN	GP
Pre-Treatment (kg/yr)	16,000	66.8	363	2,620
Post Treatment (kg/yr)	600	3.91	50.3	0
Reduction Achieved (%)	96.3	94.1	86.2	100
NorBE Target	1040	5.81	62.8	0
Target Met	Yes	Yes	Yes	Yes

## 9.5 PROPOSED FOGO SITE - ENTIRE CATCHMENT FLOW ANALYSIS

A third MUSIC model was prepared to represent the proposed development site conditions under DA9/2021, with the addition of the internal shed change of use proposed under this current application. The only changes relate to water reuse rates, and all source nodes and other treatment node parameters remain unchanged.

**Table 7: Modelled Pollutant Loads from Proposed Development Site**

	TSS	TP	TN	GP
Pre-Treatment (kg/yr)	15,800	65.9	363	2,630
Post Treatment (kg/yr)	577	3.88	50.9	0
Reduction Achieved (%)	96.3	94.1	86.0	100
NorBE Target	1040	5.81	62.8	0
Target Met	Yes	Yes	Yes	Yes



## **10.0 WATER BALANCE ASSESSMENT**

A water balance for the site and impacts of the approved DA9/2021 and proposed FOGO application can be generally summarised with the following components;

- Direct rainfall onto the site – no external catchments flow into the site operations area,
- Evaporation from the site, including from open water storage dams, silt traps and the approved wetland area,
- Site operations usage demand, including proposed changes related to this application, as detailed in Section 6 and Appendix F of this report,
- Diversion of roof water tank overflows – per NSW EPA advice, DA9/2021 directed that rainwater tank overflows be diverted around the site storage dams to discharge directly from the site.

It is noted that the site design also includes firefighting storage tanks. These tanks will be filled following installation and are to be retained as a permanent emergency storage – they are not expected to be drawn upon other than in a fire emergency, and so will not contribute to the site water balance model.

### **10.1 DAM STORAGE VOLUMES**

Under the DA9/2021 assessment, it was necessary to assess the capacity of the storage dams on the site and assess their adequacy with regards to the Environmental Guidelines; Composting and Related Organics Processing Facilities (DEC, 2004). This guideline requires both Dam 1 and Dam 2 / 3 to have sufficient storage volumes to capture and store a 1-in-10 year, 24 hour period storm event without overflowing. Current Intensity-Frequency-Duration (IFD) data was sourced from the Bureau of Meteorology, which showed the 10% AEP 24hr duration rainfall depth to be 179mm. The table below summarises the required storage volumes calculated using the Rational Method. Technically this required storage volume could be made available through any combination of the available storages onsite - sediment forebays, the constructed wetland, rainwater tanks and the dams themselves.

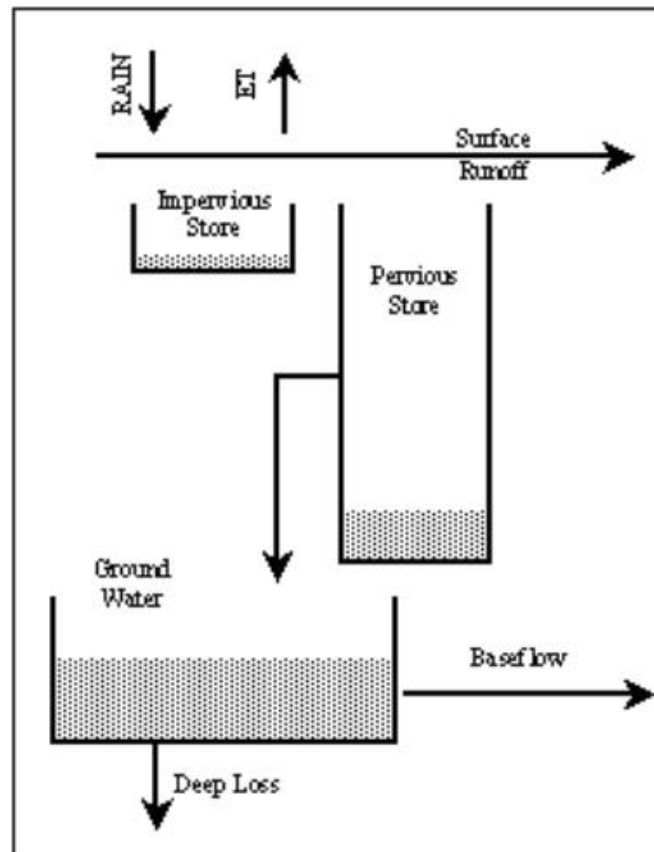
**Table 8: Dam Storage Volumes**

	Dam 1	Dam 2 / 3
Total Catchment Area (ha)	4.80	7.70
Percentage Impervious (%)	81	74
Runoff Coefficient	0.84	0.80
Design Rainfall Depth (mm)	179	179
Required Storage Volume (cu.m)	7,220	11,030
Dam Volume Available (cu.m)	15,700	14,900

It is important to recognise that with the design capacity for any drainage or water retention system, there will always be rainfall events that are beyond this design standard, and which will result in managed overflows. In this case with the design storage capacity of the storage system being a 1-in-10 year 24 hour storm, controlled overflow would be expected in any 24 hour event with an Annual Exceedance Probability (AEP) greater than 1-in-10, and also many lower AEP events that may have a duration longer than 24 hours as the dams storages will not reset every 24 hours during an extended rain event.

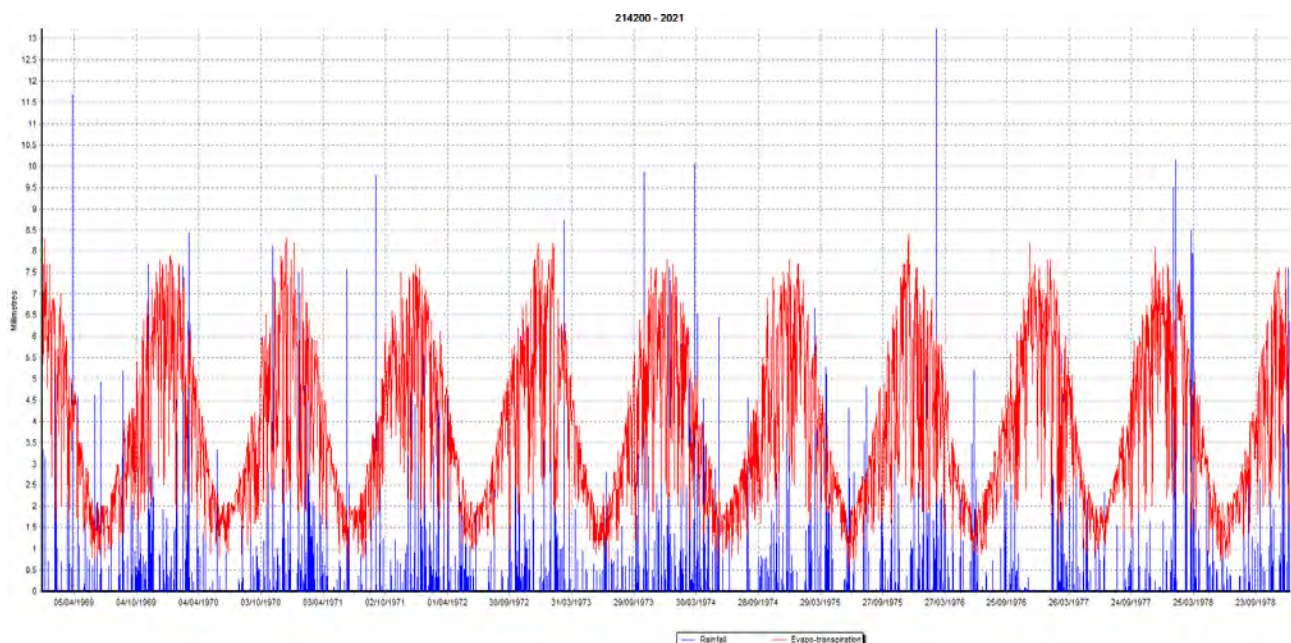
To give an indication of the longer term site water balances and the possible number and quantity of site discharges, the MUSIC model detailed in Section 9.5 of this report has been utilised to undertake a Water Balance Assessment of the proposed development.

MUSIC offers a continuous simulation approach using real world rainfall inputs over an extended period, to more realistically model long-term conditions (which include extended wet and dry periods). The conceptual hydrological model utilised in the MUSIC model is shown below.



**Figure 6: Conceptual Rainfall-Runoff Model adopted for MUSIC**

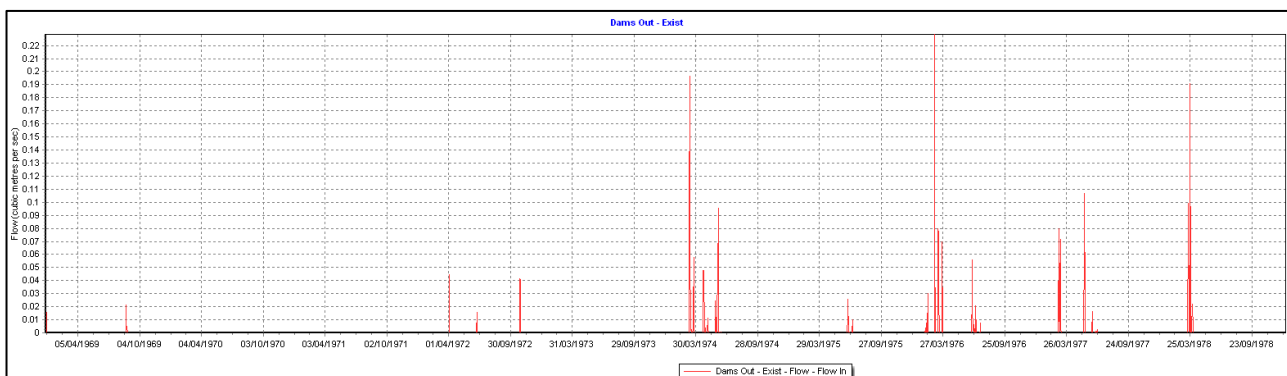
The MUSIC model inputs include ten years of real-world rainfall data (in six-minute timesteps) and monthly average Potential Evapotranspiration data. These inputs have previously been provided by MidCoast Council as the most appropriate data for use in the LGA. A time series plot of the model inputs can be seen below;



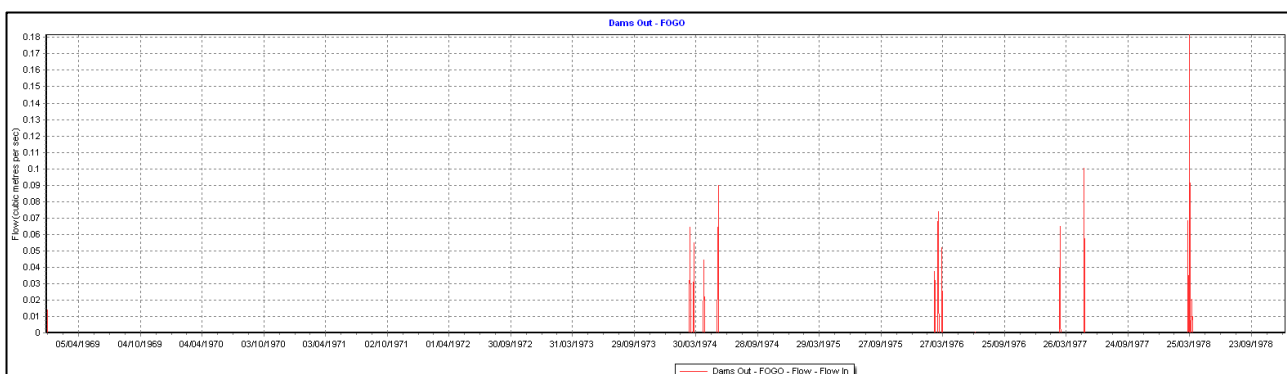
**Figure 7: Rainfall and PET Model Inputs**

A full summary of the model setup is explained above in Section 9 of this report.

With regards to infiltration rates, the MUSIC software does allow for modelling infiltration via what is known as a 'secondary linkage' with a 'Deep Seepage' outflow component. However, both the Council and NSW MUSIC modelling guidelines suggest that for the soil type present on this site, a deep seepage rate of zero should be adopted. The effect of this is that no water is lost from the model as seepage, but instead is modelled as baseflow. As this flow remains within the model and contributes to storage dam inputs, this is considered conservative for the purposes of this assessment. In any case, negligible infiltration would be expected given the highly impervious nature of the proposed site.



**Figure 8: Existing Site Modelled Site Discharges**



**Figure 9: Proposed Site Modelled Dam Discharges**

The charts above demonstrate that site discharges from the site storage dams will be reduced both in number and magnitude as a result of the proposed site upgrade works. Each of these simulated site discharges shown are a result of rainfall events greater in magnitude than the required design standards, and typically relate to extended wet periods (where there are multiple days of wet weather and the storage dams are not able to be appropriately emptied again before the next rainfall input).

These events would generally coincide with local or regional flooding events. For example, analysis of the period between mid-January and mid-March 1976 indicates over 900mm of rainfall (four times greater than the long term median value) and results in several days of site discharges.

A Node Water Balance at the outlet node is summarised in the table below.

**Table 9: Outlet Node Water Balance**

	Current (Pre DA9/2021) site conditions	With Existing Site Approvals	With Proposed FOGO Modification
Total Rainfall Inflow (ML/yr)	167.0	166.0	166.0
Surface Evapotranspiration Loss (ML/yr)	58.7	47.3	47.2
Total Baseflow (ML/yr)	7.5	4.9	4.9
Total Stormflow (ML/yr)	100.5	113.7	114.0
Change in Soil Storage (ML/yr)	0.3	0.2	0.2
Storage Evapotranspiration Loss (ML/yr)	13.5	15.7	15.4
Total Reuse (ML/yr)	64.9	79.9	80.6
Total Overflow (ML/yr)	30.9	25.4	25.4
Dam Overflows (ave. days/yr)	5.2	3.1	3.1

The modelling results shown in Table 9 and Figures 8 & 9 show that while there will be some controlled discharges in certain rainfall events, both the number and size of these discharges will be reduced as a result of the increased storage volumes and reuse demands created by the DA9/2021 approval, and further nominal improvements as a result of the current FOGO application.



## **11.0 COSTS**

The proposed development is to be contained within private land and, as such, none of the proposed water sensitive design elements are to become Council assets. Any costs associated with the Water Sensitive Design Strategy are to be borne by the proprietors of the processing plant.

## **12.0 CONSTRUCTION SOIL AND WATER MANAGEMENT**

A critical time for increased pollutant loads is during construction, and with this in mind, current practice recommends Managing Urban Stormwater, Landcom, 2004 (The “Blue Book”) as the industry standard. Erosion and sediment control measures should be designed and specified in accordance with the “Blue Book” guidelines, and to Council satisfaction, and be inspected and maintained during the construction phase. This will assist in ensuring adherence to pollutant prevention objectives, particularly the removal of suspended solids (sediment).

As this report has been prepared for an application to change the internal use of an already approved shed, the following evaluation was undertaken as part of DA9/2021 which approved the construction of the shed;

As the construction footprint will be in excess of 2,500sq.m, typically it would be expected that a detailed Soil and Water Management Plan would need to be prepared for construction stage prior to release of the Construction Certificate. This would normally include calculations of likely soil loss during construction, instructions on preferred construction sequence and limiting land disturbance, and calculations for the provision and sizing of any temporary sedimentation basin to cover the period of civil works.

As a general comment on this site, the fact that the current application is within the existing development footprint will likely limit any significant risk of erosion and sedimentation issues. The site falls below the ‘A-Line’ in Figure 4.6 of The Blue Book and as such is classified as having a Low Erosion Hazard potential.

The following RUSLE calculation has also been carried out (per the “Blue Book”):

$$A = R \times K \times LS \times P \times C \quad (\text{Eq.1 App A1})$$

where      A = computed soil loss (tonnes/ha/yr)  
               R = rainfall erosivity factor  
               K = soil erodibility factor  
               LS = slope length/gradient factor  
               P = erosion control practice factor  
               C = ground cover and management factor

And

$$R = 164.74 \times (1.1177)^S \times S^{0.6444} \quad (\text{Eq.2. App A})$$

where      S = 2yr ARI 6hr rainfall intensity

In relation to the proposed development site:

2-year 6-hour Intensity = 11.5mm/hr      (former GLC Engineering Dept)

R = 2860      (Eq 2 App A)

K = 0.041      (Tab 14 App C ‘pr Pindimar Rd’)

LS = 1.47 (6% Slope for 80m)      (Tab A1 App A)

P = 1.3      (Tab A2 App A)

C = 1.0 (bare earth during construction)

The resulting computed soil loss is therefore calculated as 224m<sup>3</sup>/ha/yr, or 134m<sup>3</sup>/yr over the combined site disturbance area (0.6ha). This result is below the 150m<sup>3</sup>/yr trigger in The Blue Book:

*S6.3.2 (d) – “Some small and/or flat sites might not warrant construction of a sediment basin.....the average annual soil loss from the total area of land disturbance can be estimated.....Where this is less than 150 cubic metres per year, the building of a sediment retention basin can be considered unnecessary”.*

As such, no construction sedimentation basins are specifically required during construction, and the erosion risk should be able to be adequately addressed with standard construction erosion control measures such as silt fencing and sandbagging. It is noted however, that the existing silt traps and storage dams will operate as de facto sedimentation basins anyway, providing additional surety that construction sedimentation issues can be appropriately addressed.

## **13.0 OPERATION, MAINTENANCE AND MONITORING PLAN**

As described above, any maintenance is to be carried out by the proprietors of the processing plant. This will normally be limited to periodic cleaning of the water tanks and removal of excess sediment from the silt traps and dams (both periodically and after major storm events).

Constant monitoring of dams levels is required to ensure that stored water is either utilised on site or dispersed around the site as required. This is particularly important in the leadup to forecast large rainfall events, to ensure that the minimum storage volume identified in Table 5 is available in a 1-in-10 year event.

Under current EPA Environmental Protection Licence requirements, the site operators keep daily observations and records, including;

- Rainfall,
- Wind speed & direction
- Dam storage levels,
- Onsite water usage.

The water quality in site dams is also tested bi-annually for various water quality indicators, including;

- Chloride
- Nitrates
- pH
- Phosphate
- Sulphate
- Total Suspended Solids
- Potassium
- Sodium
- Lead
- Zinc

Monitoring and testing records are kept onsite, and also provided to the EPA as required by the current EPL. A sample of current records has been included in Appendix of this report.

## **14.0 CONCLUSIONS**

The site operates under an active management scenario whereby no runoff is permitted to leave the development footprint under normal operating conditions. Surface runoff is captured and stored for re-use onsite. The current application to change the internal use of an already approved shed will not have any impacts on surface water runoff volumes or quality, and the slight increases in internal water demand will result in a minor improvement to overall long term site discharge conditions.

In addition, the current application is not impacted by local or regional flooding, and will not have any impact on local or regional flooding.

## **15.0 REFERENCES**

*Environmental Guidelines; Composting and Related Organics Processing Facilities*,  
July 2004, Department of Environment and Conservation (NSW)

*Guidelines for Water Sensitive Design Strategies*, October 2019, MidCoast Council &  
Alluvium

*NSW MUSIC Modelling Guidelines*, 2015, BMT WBM

*MUSIC Version 6.0 User Manual*, 2011, eWater



## APPENDIX A: EPL3877

# Environment Protection Licence



Licence - 3877

Licence Details	
Number:	3877
Anniversary Date:	14-April

Licensee
AUSTRALIAN NATIVE LANDSCAPES PTY LTD
PO BOX 113
TERREY HILLS NSW 2084

Premises
LOT 1 PINDIMAR ROAD
TEA GARDENS NSW 2324

Scheduled Activity
Resource recovery
Waste storage

Fee Based Activity	Scale
Recovery of general waste	Any general waste recovered
Waste storage - other types of waste	Any other types of waste stored

Region
Waste & Resource Recovery
59-61 Goulburn Street
SYDNEY NSW 2000
Phone: (02) 9995 5000
Fax: (02) 9995 5999
PO Box A290 SYDNEY SOUTH
NSW 1232

# Environment Protection Licence



Licence - 3877

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# Environment Protection Licence

Licence - 3877



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# Environment Protection Licence

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Licence - 3877



## Information about this licence

### Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

### Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

### Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

### Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

### Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

### Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

# Environment Protection Licence



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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

### Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

### Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

### This licence is issued to:

AUSTRALIAN NATIVE LANDSCAPES PTY LTD
PO BOX 113
TERREY HILLS NSW 2084

subject to the conditions which follow.



# Environment Protection Licence

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## 1 Administrative Conditions

### A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Resource recovery	Recovery of general waste	Any general waste recovered
Waste storage	Waste storage - other types of waste	Any other types of waste stored

### A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
LOT 1 PINDIMAR ROAD
TEA GARDENS
NSW 2324
LOT 1 DP 714149

### A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

## 2 Discharges to Air and Water and Applications to Land

# Environment Protection Licence

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## P1 Location of monitoring/discharge points and areas

- P1.1 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.
- P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

### *Water and land*

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1		Discharge to utilisation area	Utilisation area as marked on the map titled "Tea Gardens Site Layout Water Management Plan" labelled as "New Area 1" submitted to the EPA on 19 July 2016 (EPA Ref DOC16/353637-01)

## 3 Limit Conditions

### L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

### L2 Waste

- L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Non-putrescible vegetative waste from agriculture, silviculture or horticulture	As defined in Schedule 1 of the Protection of the Environment Operations Act 1997.	Resource recovery Waste storage	See condition L2.2 below
NA	Garden waste	As defined in Schedule 1 of the Protection of the Environment Operations Act 1997	Resource recovery Waste storage	See condition L2.2 below
NA	Wood waste	As defined in Schedule	Resource recovery	See condition

# Environment Protection Licence

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	1 of the Protection of the Environment Operations Act 1997.	Waste storage	L2.2 below
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- L2.2 The total quantity of waste processed at the premises must not exceed any of the current consent approved limits, being:
1. 150,000 tonnes per annum
  2. 2,700 tonnes per week
  3. 600 tonnes per day
- L2.3 Notwithstanding any limit specified in the above table, the licensee shall not exceed the authorised amount specified in this licence. Where the authorised amount is less than the total of all wastes listed above, the authorised amount takes precedent.
- L2.4 The authorised amount of waste permitted on the premises (unprocessed and processed) cannot exceed 100,000 tonnes at any one time.

## L3 Noise limits

- L3.1 Where a noise limit has not been prescribed, all operations and activities occurring on the premises must be conducted in a manner that does not cause offensive noise.

Note: Development Consent DA-3264-1988 prescribes a  $L_{A10}$  noise limit at nearby residences of 40 dBA.

## L4 Hours of operation

- L4.1 The hours of operation of the premises, including loading and unloading of trucks, must be limited to:
1. 6:00am to 6:00pm Monday to Friday;
  2. 8:00am to 4:00pm Saturdays; and
  3. All reasonable measures must be taken to limit the arrival of trucks prior to 7:00am.
- L4.2 To avoid any confusion, retail sales from the premises can occur:
1. during the hours as detailed in Condition L4.1, and
  2. between 8:00am and 4:00pm on Sundays.
- L4.3 Unless otherwise specified by any other condition of this licence, all construction activities associated with the construction of the facilities approved by Great Lakes Council (DA-227/2015 - Landscape material supplies, packing shed and maintenance facility, managers residence and associated works) are:
1. restricted to between the hours of 7:00am and 6:00pm Monday to Friday;
  2. restricted to between the hours of 8:00am and 1:00pm Saturday; and
  3. not to be undertaken on Sundays or Public Holidays.

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## **L5 Potentially offensive odour**

- L5.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environmental protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

## **4 Operating Conditions**

### **O1 Activities must be carried out in a competent manner**

- O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

### **O2 Maintenance of plant and equipment**

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- a) must be maintained in a proper and efficient condition; and
  - b) must be operated in a proper and efficient manner.

### **O3 Dust**

- O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.
- O3.2 Activities occurring in or on the premises must be carried out in a manner that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust.

### **O4 Effluent application to land**

- O4.1 Spray from effluent application must not drift beyond the boundary of the premises.
- O4.2 The quantity of effluent/solids applied to the utilisation area must not exceed the capacity of the area to effectively utilise the effluent/solids.

For the purpose of this condition, 'effectively utilise' include the use of the effluent/solids for pasture or

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crop production, as well as the ability of the soil to absorb the nutrient, salt, hydraulic load and organic material.

## **O5 Processes and management**

O5.1 The licensee must have in place and implement procedures to minimise the risk of fire at the premises.

## **O6 Waste management**

O6.1 There must be no incineration or burning of any waste at the premises.

O6.2 All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

## **5 Monitoring and Recording Conditions**

### **M1 Monitoring records**

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- a) in a legible form, or in a form that can readily be reduced to a legible form;
- b) kept for at least 4 years after the monitoring or event to which they relate took place; and
- c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

- a) the date(s) on which the sample was taken;
- b) the time(s) at which the sample was collected;
- c) the point at which the sample was taken; and
- d) the name of the person who collected the sample.

### **M2 Recording of pollution complaints**

M2.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M2.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;

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- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M2.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M2.4 The record must be produced to any authorised officer of the EPA who asks to see them.

## M3 Telephone complaints line

- M3.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M3.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M3.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

## 6 Reporting Conditions

### R1 Annual return documents

- R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
  - 1. a Statement of Compliance,
  - 2. a Monitoring and Complaints Summary,
  - 3. a Statement of Compliance - Licence Conditions,
  - 4. a Statement of Compliance - Load based Fee,
  - 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
  - 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
  - 7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

- R1.3 Where this licence is transferred from the licensee to a new licensee:
  - a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
  - b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and



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ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

## **R2 Notification of environmental harm**

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

## **R3 Written report**

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

- a) where this licence applies to premises, an event has occurred at the premises; or
- b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

- a) the cause, time and duration of the event;

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- b) the type, volume and concentration of every pollutant discharged as a result of the event;
- c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
- d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

## 7 General Conditions

### G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

### G2 Contact number for incidents and responsible employees

G2.1 The licensee must operate 24-hour telephone contact lines for the purpose of enabling the EPA to directly contact one or more representatives of the licensee who can:

- a) respond at all times to incidents relating to the premises; and
- b) contact the licensee's senior employees or agents authorised at all times to:
  - i) speak on behalf of the licensee; and
  - ii) provide any information or document required under this licence.

G2.2 The licensee is to inform the EPA in writing of the appointment of any subsequent contact persons, or changes to the person's contact details as soon as practicable and in any event within fourteen days of the appointment or change.

## 8 Special Conditions

### E1 Daily record

E1.1 The daily record required by Condition 6 of the Conditions of Consent in orders made in matter 10366 of

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1990 in the Land and Environment Court of NSW, or a duplicate thereof, must be made available to any authorised officer of the EPA who asks to see it. This record relates to:

- The water levels of the dams;
- The pump out rate and times for each dam;
- The irrigation rate per area under irrigation; and
- The daily rainfall.

## **E2 Water Quality Monitoring Report for Dam No. 2**

- E2.1 The licensee must supply copies of water quality reports for Dam No. 2, as required by Clause 7 of the Conditions of Consent in orders made in matter 10366 of 1990 in the Land and Environment Court of NSW, to the EPA.
- E2.2 The report required by Condition E2.1 must be supplied to the Regional Manager, Hunter, every 6 months, commencing with the report for the first sample period of 2001.

## **E3 Financial Assurance**

- E3.1 One financial assurance in the form of an unconditional and irrevocable guarantee from an Australian bank, building society or credit union in favour of the EPA in the amount of fifty thousand dollars (\$50,000) must be provided to the EPA by 1 July 2017. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

One financial assurance in the form of an unconditional and irrevocable guarantee from an Australian bank, building society or credit union in favour of the EPA in the amount of one hundred and fifty thousand dollars (\$150,000) must be provided to the EPA by 1 July 2019. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

One financial assurance in the form of an unconditional and irrevocable guarantee from an Australian bank, building society or credit union in favour of the EPA in the amount of three hundred thousand dollars (\$300,000) must be provided to the EPA by 1 July 2021. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

- E3.2 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.
- E3.3 The financial assurance must be replenished by the full amount claimed or realised if the EPA has claimed on or realised the financial assurance or any part of it to undertake a work or program required to be carried out by the licence which has not been undertaken by the licence holder.
- E3.4 The EPA may require an increase the amount of the financial assurance at any time as a result of reassessment of the total likely costs and expenses of rehabilitation of the premises.

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E3.5 The licensee must provide to the EPA the original counterpart guarantee within five working days of the issue of:

- a) the financial assurance required by condition E3.1, and
- b) the adjusted financial assurance as required by condition E3.3 or E3.4.

Note: The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out any work or program required to comply with the conditions of this licence.

## E4 Environmental Obligations of Licensee

E4.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

- a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.
- b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.
- c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E4.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must:

- a) make all efforts to contain all firewater on the licensee's premises,
- b) make all efforts to control air pollution from the licensee's premises,
- c) make all efforts to contain any discharge, spill or run-off from the licensee's premises,
- d) make all efforts to prevent flood water entering the licensee's premises,
- e) remediate and rehabilitate any exposed areas of soil and/or waste,
- f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of,
- g) at the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises,
- h) at the request of the EPA monitor surface water leaving the licensee's premises; and
- i) ensure the licensee's premises is secure.

E4.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

- a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and
- b) rehabilitate the site, including conducting an assessment of and if required remediation of any site contamination.

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## Dictionary

### General Dictionary

<b>3DGM [in relation to a concentration limit]</b>	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
<b>Act</b>	Means the Protection of the Environment Operations Act 1997
<b>activity</b>	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
<b>actual load</b>	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
<b>AM</b>	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
<b>AMG</b>	Australian Map Grid
<b>anniversary date</b>	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
<b>annual return</b>	Is defined in R1.1
<b>Approved Methods Publication</b>	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
<b>assessable pollutants</b>	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
<b>BOD</b>	Means biochemical oxygen demand
<b>CEM</b>	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
<b>COD</b>	Means chemical oxygen demand
<b>composite sample</b>	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
<b>cond.</b>	Means conductivity
<b>environment</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>environment protection legislation</b>	Has the same meaning as in the Protection of the Environment Administration Act 1991
<b>EPA</b>	Means Environment Protection Authority of New South Wales.
<b>fee-based activity classification</b>	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
<b>general solid waste (non-putrescible)</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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<b>flow weighted composite sample</b>	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
<b>general solid waste (putrescible)</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
<b>grab sample</b>	Means a single sample taken at a point at a single time
<b>hazardous waste</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
<b>licensee</b>	Means the licence holder described at the front of this licence
<b>load calculation protocol</b>	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
<b>local authority</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>material harm</b>	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
<b>MBAS</b>	Means methylene blue active substances
<b>Minister</b>	Means the Minister administering the Protection of the Environment Operations Act 1997
<b>mobile plant</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
<b>motor vehicle</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>O&amp;G</b>	Means oil and grease
<b>percentile [in relation to a concentration limit of a sample]</b>	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
<b>plant</b>	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
<b>pollution of waters [or water pollution]</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>premises</b>	Means the premises described in condition A2.1
<b>public authority</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>regional office</b>	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
<b>reporting period</b>	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
<b>restricted solid waste</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
<b>scheduled activity</b>	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
<b>special waste</b>	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
<b>TM</b>	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .



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<b>TSP</b>	Means total suspended particles
<b>TSS</b>	Means total suspended solids
<b>Type 1 substance</b>	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
<b>Type 2 substance</b>	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
<b>utilisation area</b>	Means any area shown as a utilisation area on a map submitted with the application for this licence
<b>waste</b>	Has the same meaning as in the Protection of the Environment Operations Act 1997
<b>waste type</b>	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Ms Nadia Kanhoush

Environment Protection Authority

(By Delegation)

Date of this edition: 06-September-2000

# Environment Protection Licence

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## End Notes

- 1 Licence varied by notice 1002091, issued on 29-Sep-2000, which came into effect on 24-Oct-2000.
- 2 Licence varied by notice 1004032, issued on 05-Feb-2001, which came into effect on 02-Mar-2001.
- 3 Licence varied by notice 1007723, issued on 19-May-2001, which came into effect on 13-Jun-2001.
- 4 Licence varied by notice 1009514, issued on 19-Jul-2001, which came into effect on 13-Aug-2001.
- 5 Licence varied by notice 1010711, issued on 25-Aug-2001, which came into effect on 19-Sep-2001.
- 6 Licence varied by notice 1022201, issued on 21-Jan-2003, which came into effect on 15-Feb-2003.
- 7 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 8 Licence varied by notice 1100221, issued on 07-Aug-2009, which came into effect on 07-Aug-2009.
- 9 Licence transferred through application 145923, approved on 13-Aug-2009, which came into effect on 13-Apr-2009.
- 10 Licence varied by notice 1127143, issued on 23-May-2011, which came into effect on 23-May-2011.
- 11 Licence varied by notice 1501442 issued on 05-Oct-2011
- 12 Licence varied by notice 1503049 issued on 19-Dec-2011
- 13 Licence varied by notice 1508804 issued on 12-Oct-2012
- 14 Licence transferred through application 1519424 approved on 20-Jan-2014 , which came into effect on 01-Feb-2014
- 15 Licence varied by notice 1542595 issued on 05-Sep-2016

## APPENDIX B: DUST & LITTER COMPLIANCE PROGRAM

25 NOV 2016

Our reference : DOC16/540999  
File : EF16/11236

The Proper Officer  
Australian Native Landscapes Pty Ltd  
PO Box 113  
TERREY HILLS NSW 2084

Att: Mr Patrick Soars

STANDARD POST  
21 November 2016

To the Proper Officer

### Dust and Litter Compliance Program

The NSW Environment Protection Authority ("EPA") is commencing a compliance program targeting dust emissions and windblown litter.

#### Why are you getting this letter?

The EPA understands that you hold Environment Protection Licence 3877 issued under the *Protection of the Environment Operations Act 1997* ("the Act") that permits scheduled waste activities.

The EPA is commencing a compliance program to examine dust and litter management at licensed waste facilities. The program will focus on the management procedures in place to:

- prevent dust emissions from the premises;
- prevent or minimise dust generation from waste stockpiles, unsealed haul roads, trucks tipping and waste processing activities; and
- prevent windblown litter from the premises.

As part of the program, EPA officers will be conducting inspections of a selection of facilities. As such, **your premises may be inspected** over the coming months. Inspections will commence in December 2016 and will be carried out without prior notice.

Inspections which form part of the program will assess each licensee's compliance with operating conditions ***O1 Activities must be carried out in a competent manner*** and ***O3 Dust***, attached to environment protection licences with respect to preventing dust emissions and windblown litter.

### Dust and Litter Management

The commencement and continuation of consistently hot, dry and windy weather conditions increases the potential that dust and litter will be generated at waste facilities.

The EPA would like to take this opportunity to remind you to ensure that all appropriate dust and litter controls are in place at your premises. In particular, the EPA requests that you take this opportunity to review operating control equipment or measures at your premises to ensure they are adequate **during all weather conditions**. Refer to the attached factsheet on controls you can use to help mitigate dust.

### **Heath Effects**

There is growing concern over the health effects of particulate matter, which contributes to air pollution. Sources of particle pollution include motor vehicles, power plants, residential wood heaters, bushfires, agricultural burning, and industrial processes such as waste processing. Particulate matter includes inhalable particles that are small enough to penetrate the respiratory system. The World Health Organisation notes that the health effects of exposure to particulate matter may include respiratory and cardiovascular morbidity, such as aggravation of asthma, respiratory symptoms and an increase in hospital admissions

### **Penalties apply**

You are reminded that the EPA may impose penalties where it establishes that breaches of an Environment Protection Licence or environmental legislation have occurred. In addition, Directors and managers of companies may also be personally liable for offences, even if a company is not convicted for that offence.

Should you wish to discuss this, please contact Grace Bell on (02) 4908 6893.

Yours faithfully

A handwritten signature in black ink, appearing to be 'S. James', written over a circular stamp or seal.

**STEVEN JAMES**  
**Unit Head Waste Compliance - Hunter**  
**Environment Protection Authority**

## FACTSHEET – MITIGATING DUST AND LITTER

---

### *Dust Control*

Dust control measures that could be used at the premises to minimise the generation of dust may include, but are not limited to:

- *Dust Controls*
  - constructing a shed; ensure all waste processing and storage occurs inside the building
  - use of dust suppression sprays/systems on fixed processing plant
  - use of water sprinklers, water carts and hoses on stockpiles, processing areas, during unloading and loading, and on unsealed roads
  - consider controls in addition to water spraying, in areas of fine soil or in windy conditions
  - ensuring waste transporters cover their loads
  - managing and reducing stockpile heights
  - covering stockpiles
- *Stabilising Ground Surfaces*
  - constructing hardstands under all processing areas; waste storage areas and sealed roads from the public roadway to the gatehouse/waste reception area of the premises
  - vegetate or cover exposed earthen surfaces
- *Preventing and Managing Tracking*
  - use of sweepers to clean sediment from internal and external roads
  - separating road vehicles from processing areas
  - installing road vehicle wheel washes and/or shaker grids to reduce the impact of tracking on public roads
- *Managing Weather Conditions*
  - installing dust barriers and windbreaks, such as shielding plant and disrupting the flow of wind through the material
  - changing practices during windy conditions, including temporarily ceasing operations

### *Litter Control*

Litter control measures that could be used at the premises may include, but are not limited to:

- daily litter inspections and litter collections by staff;
- installing a perimeter fence to prevent litter leaving the premises; and
- maintaining ashtrays and bins where staff take breaks.



## **APPENDIX C: COMPLIANCE WITH NSW ENVIRONMENTAL LEGISLATION**

Tea Garden

Christine Cross

---

**From:** Hannah Schuchmann <Hannah.Schuchmann@epa.nsw.gov.au>  
**Sent:** Thursday, 11 May 2017 2:30 PM  
**To:** Patrick Soars

Our reference: DOC17/268754  
File: EF16/11236

patrick@anlscape.com.au

**EMAIL AND STANDARD POST**  
**15 May 2017**

Dear Mr Soars,

### **Compliance with NSW Environmental Legislation**

The NSW Environment Protection Authority ("EPA") is writing to remind you of your obligation to comply with legislation regulating to the notification of pollution incidents and pollution incident response management plans.

### **Why are you getting this letter?**

A number of incidents have occurred at licenced waste facilities in the Hunter and Central Coast region that have not been reported to the EPA in accordance with licence conditions or requirements under the *Protection of the Environment Operations Act 1997* ("the Act"). The EPA has also identified that licensees did not implement their Pollution Incident Response Management Plan ("PIRMP") or it was not updated to reflect staff absences over holiday periods.

As the holder of Environment Protection Licence 3877 ("the Licence") you have a number of responsibilities under the Act. Your Licence also has conditions to limit or control the risks associated with being prepared for and managing a pollution incident.

### **Have you tested your Pollution Incident Response Management Plan?**

You are required to have a PIRMP and test it at least once every 12 months. These requirements are set out in sections 153A and 153E of the Act and Clause 98E(2)(a) of the *Protection of the Environment Operations (General) Regulation 2009*. In addition you are required to submit the test date as part of your annual return.

Failure to comply with these provisions and/or requirements of the Licence can lead to serious penalties. Useful information relating to PIRMPs and a link to the EPA document titled *Environmental guidelines: preparation of pollution incident response management plans* can be found on the EPA website here: <http://www.epa.nsw.gov.au/legislation/poefaqspirmps.htm>.

## When should you notify a pollution incident?

Pollution incidents causing or threatening material harm to the environment **must** be notified. By notifying the response agencies of pollution incidents, action can be coordinated to prevent or limit harm to the environment and human health.

If you fail to report a pollution incident posing material harm to the environment as required under Part 5.7 of the Act, you commit an offence. The maximum penalty for a corporation is \$2,000,000.

Further information about your duty to notify pollution incidents can be found at the EPA's website here: <http://www.epa.nsw.gov.au/licensing/dutytonotify.htm>

## Contingencies

Responsibility to notify pollution incidents rests with the person carrying on the activity; an employee; employer; and occupier of the premises. Your PIRMP should include contingencies for when people are on leave, cannot be contacted, or would be generally unaware of their responsibility to notify pollution incidents.

## Action required

Please ensure that you and your staff are aware of these requirements so that you can be suitably prepared if a pollution incident occurs, and to ensure you can comply with your licence conditions and the law.

If you have queries about this, please call me on (02) 4908 6823.

Yours faithfully



**STEVEN JAMES**  
**Unit Head Waste Compliance - Hunter**  
**Environment Protection Authority**

---

This email is intended for the addressee(s) named and may contain confidential and/or privileged information. If you are not the intended recipient, please notify the sender and then delete it immediately. Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Environment Protection Authority.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

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Message protected by MailGuard: e-mail anti-virus, anti-spam and content filtering.  
<http://www.mailguard.com.au>

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## APPENDIX D: ANL DA DESIGN PLANS

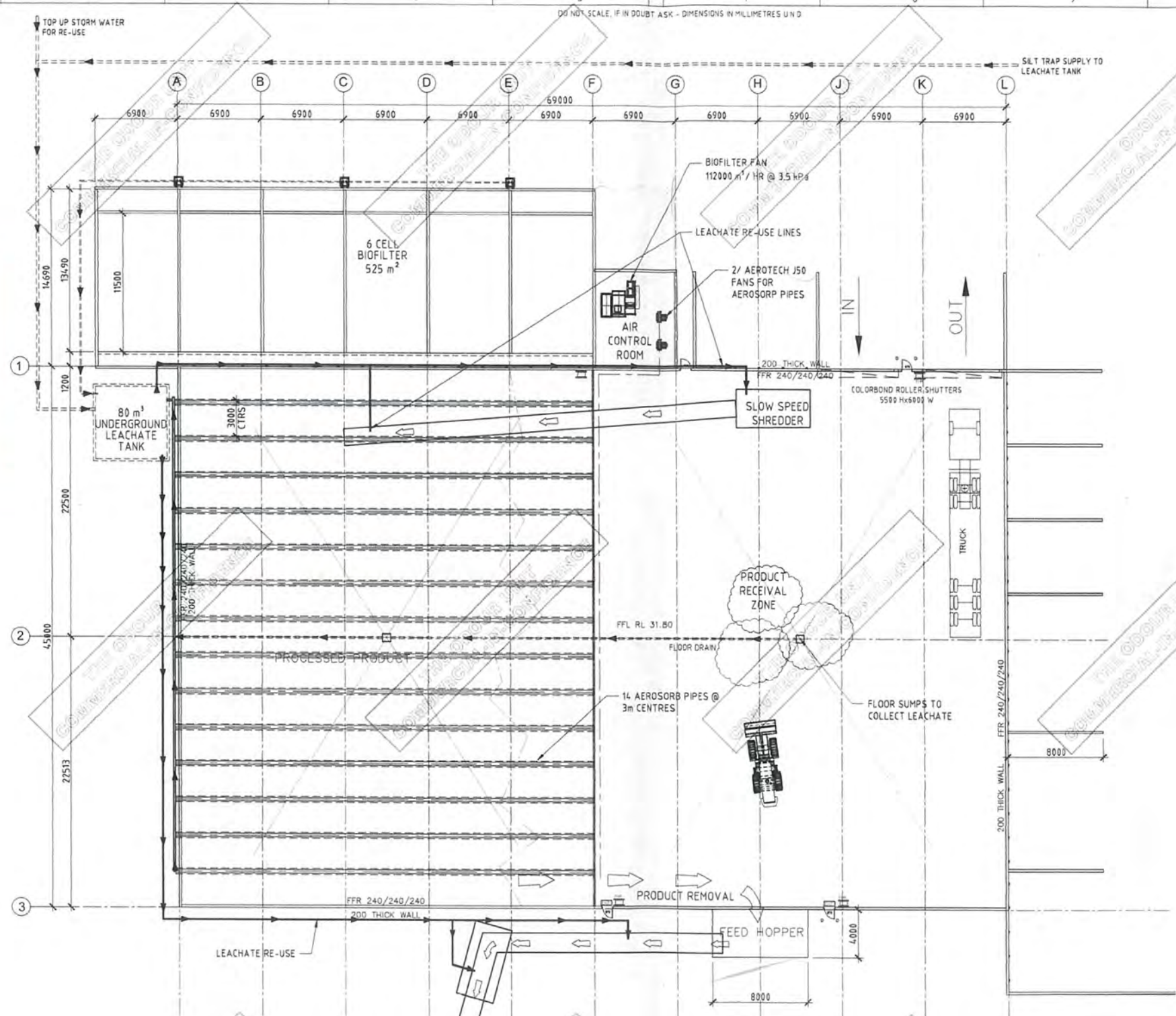
A1 2099-011 A

**MIDCOAST**  
council

Development Consent No:  
DA-9/2021

Approval Date:  
27 April 2022

Officer Name:  
Ben Lim-Cooper



**BUILDING LAYOUT**  
SCALE 1:200

EXISTING  
WOODCHIP  
MILL

REV	BY	DATE	A.R.N.	DESCRIPTION

**THE ODOUR UNIT PTY LTD**  
www.odourunit.com.au  
12/ 56 Church Ave. Mascot, NSW 2020  
Ph (02) 9209 4420

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DRAWN TO AS 1100	SCALE (A1) 1:100 (A1)
DRAWN W. WESTWOOD	15-02-21
CHECKED	
APPROVED H. ASSAL	15-02-21
DESIGN ENG W. WESTWOOD	15-02-21

CLIENT / PROJECT  
AUSTRALIAN NATIVE LANDSCAPES  
LOT 1, 8PT14149 PINDIMAR RD, TEA GARDENS

TITLE  
**ANL TEA GARDENS  
PROPOSED PLANT UPGRADE  
WOODWASTE PROCESSING BUILDING  
ODOUR CONTROL SYSTEM**

DRAWING No <b>2099-011</b>	REV <b>A</b>
CLIENT CODE N2099	
JOB No N2099	
AUTOCAD FILENAME 2099-011A.DWG	

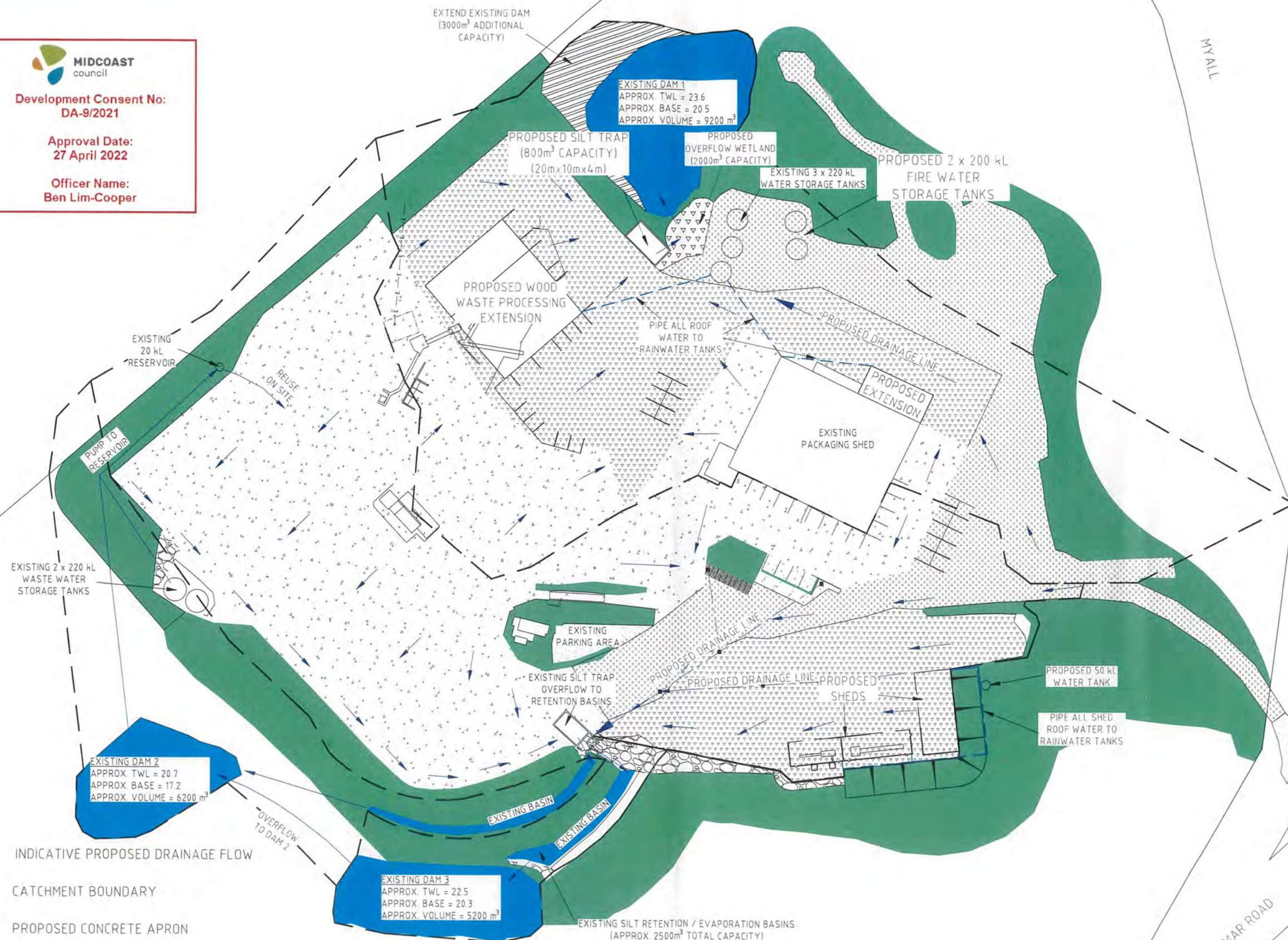




Development Consent No:  
DA-9/2021

Approval Date:  
27 April 2022

Officer Name:  
Ben Lim-Cooper



#### LEGEND



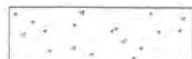
INDICATIVE PROPOSED DRAINAGE FLOW



CATCHMENT BOUNDARY



PROPOSED CONCRETE APRON



EXISTING CONCRETE APRON



EXISTING HARDSTAND



EXISTING VEGETATION



EXISTING DAM / RETENTION BASIN

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20

\* Denote the original signature and date when revision was issued.

**TATTERSALL  
LANDER** PTY LTD  
DEVELOPMENT CONSULTANTS  
ENGINEERING, SURVEYING & PLANNING  
2 Bourke St P.O. Box 580  
RAYMOND TERRACE 2324  
Fax (02) 49671733 Phone (02) 49671500

PROPOSED DRAINAGE SITE PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

COUNCIL MID-COAST	REFERENCE 2195161
PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 7 OF 9
DATE 19/11/2020 09:33 AM	

CLIENT: AUSTRALIAN NATIVE LANDSCAPES

JOB No.: 214200

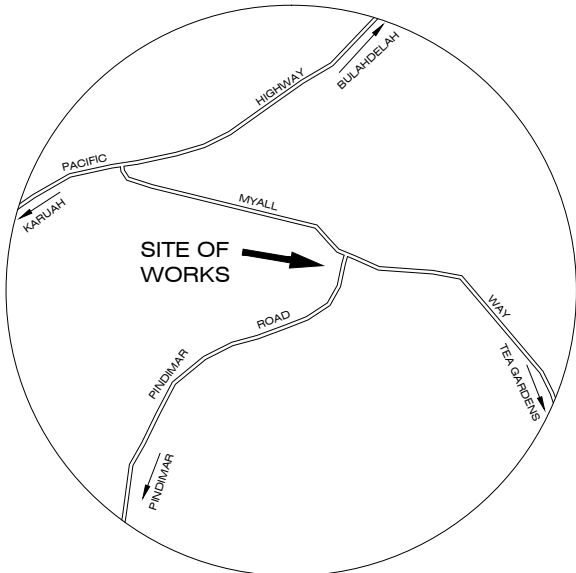
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PROPOSED PACKAGING SHEDS, WORKSHOP  
EXTENSION, WOOD WASTE PROCESSING  
BUILDING, SILT TRAP, STORAGE TANKS, DAM  
EXTENSION & ASSOCIATED WORKS

AUSTRALIAN NATIVE LANDSCAPES SITE  
PINDIMAR ROAD, TEA GARDENS  
LOT 1, DP 714149

Sheet List Table			
Sheet Number	File	Sheet Description	Revision
1	2195155	TITLE PAGE, LOCALITY SKETCH & SCHEDULE OF DRAWINGS	J
2	2195156	SITE LAYOUT PLAN	J
3	2195157	SITE DETAIL PLAN	J
4	2195158	PACKAGING SHED DETAIL PLAN	J
5	2195159	WOODWASTE PROCESSING DETAIL PLAN	J
6	2195160	WORKSHOP EXTENSION DETAIL PLAN	J
7	2195161	CATCHMENT PLAN	J
8	2195162	DRAINAGE CONCEPT SITE PLAN	J
9	2195163	PACKAGING SHED DRAINAGE DETAIL PLAN	J



LOCALITY SKETCH PLAN  
NOT TO SCALE



J	Changes per NSW EPA Directions	AV	AV			19/8/21
I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

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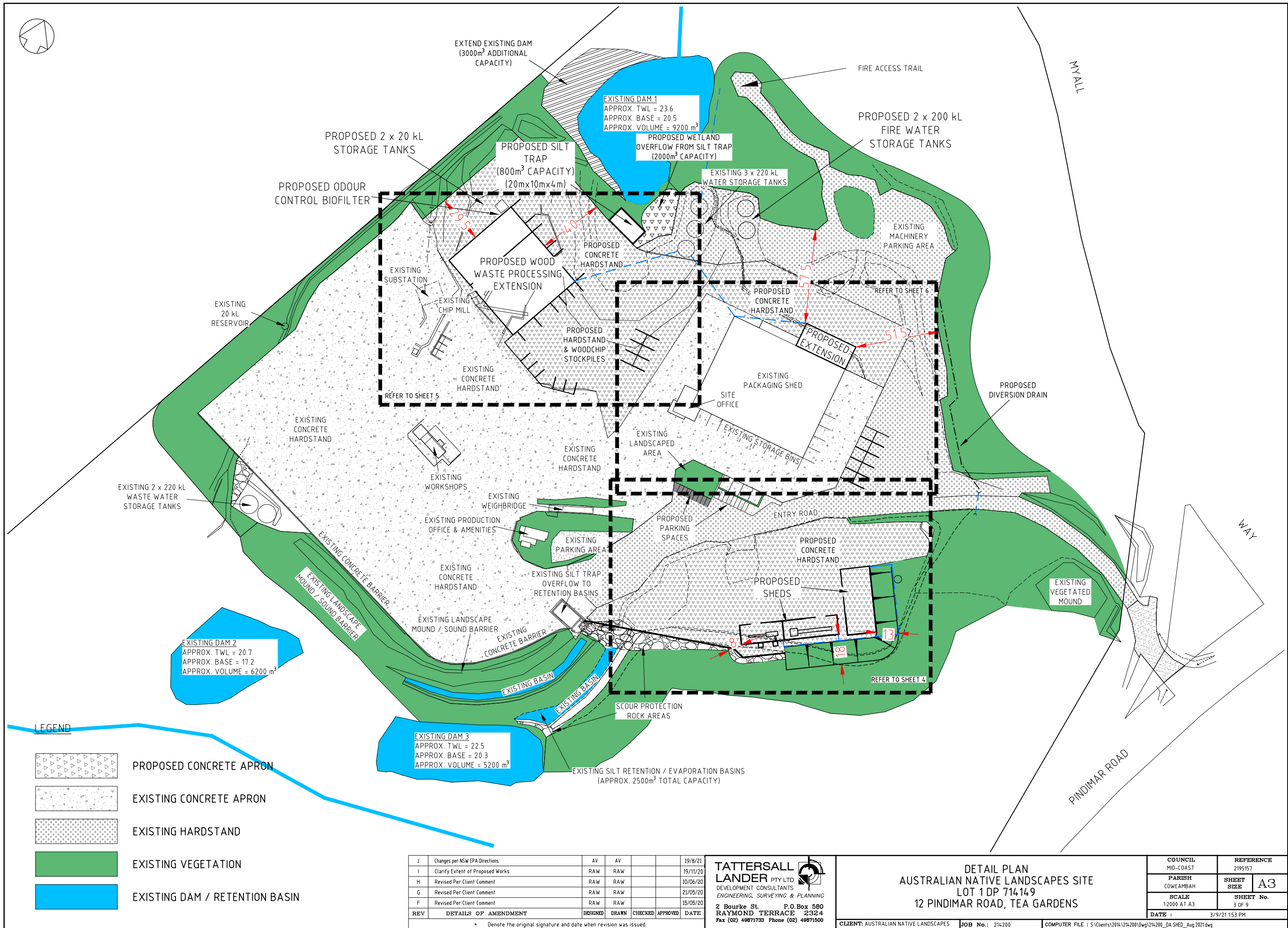
**SITE PLAN**  
**AUSTRALIAN NATIVE LANDSCAPES SITE**  
**LOT 1 DP 714149**  
**12 PINDIMAR ROAD, TEA GARDENS**

<b>COUNCIL</b> MID-COAST	<b>REFERENCE</b> 2195156
<b>PARISH</b> COWEAMBAH	<b>SHEET</b> SIZE <b>A3</b>
<b>SCALE</b> 1:4000 AT A3	<b>SHEET No.</b> 2 OF 9
<b>DATE :</b>	3/9/21 1:48 PM

CLIENT: AUSTRALIAN NATIVE LANDSCAPES

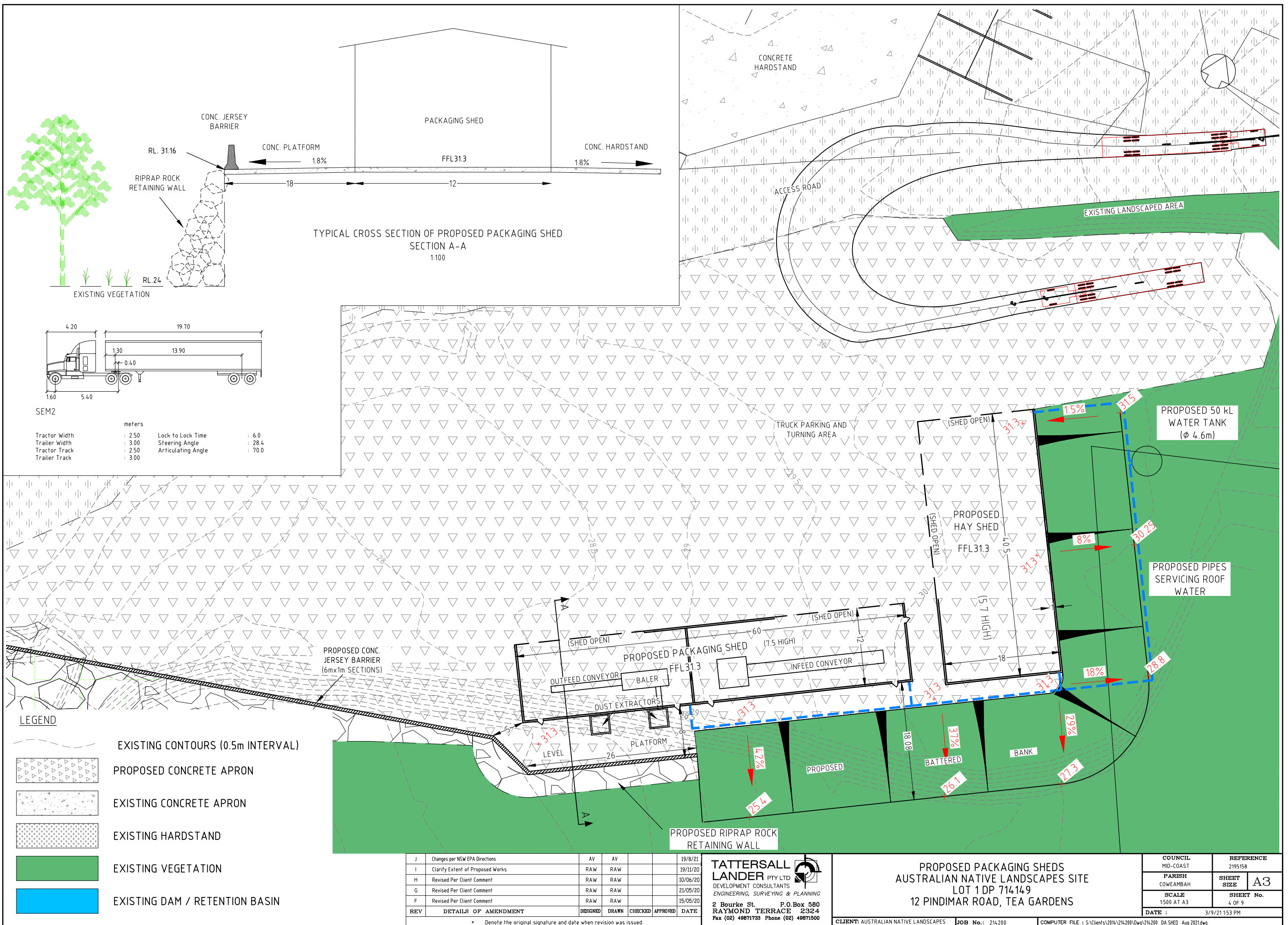
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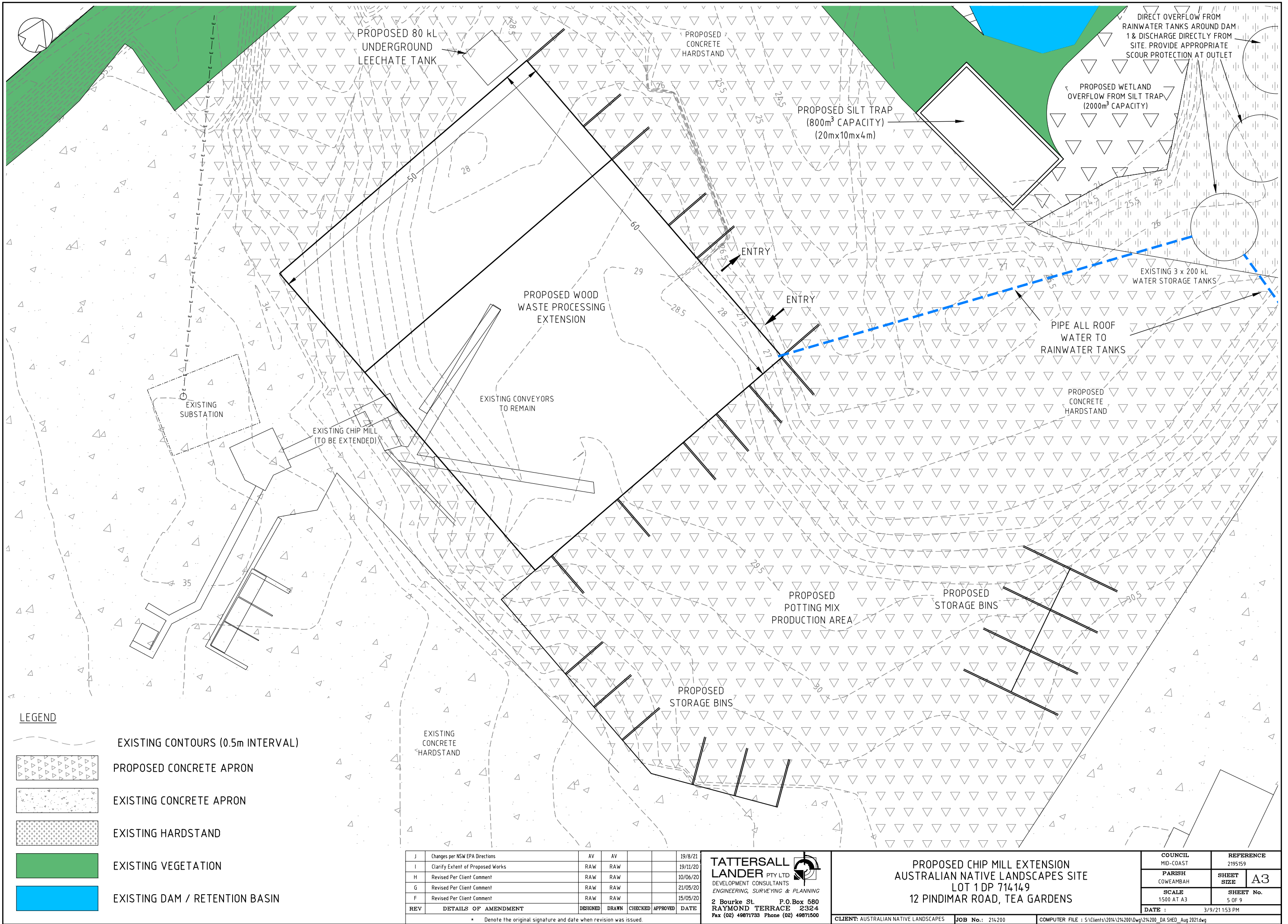
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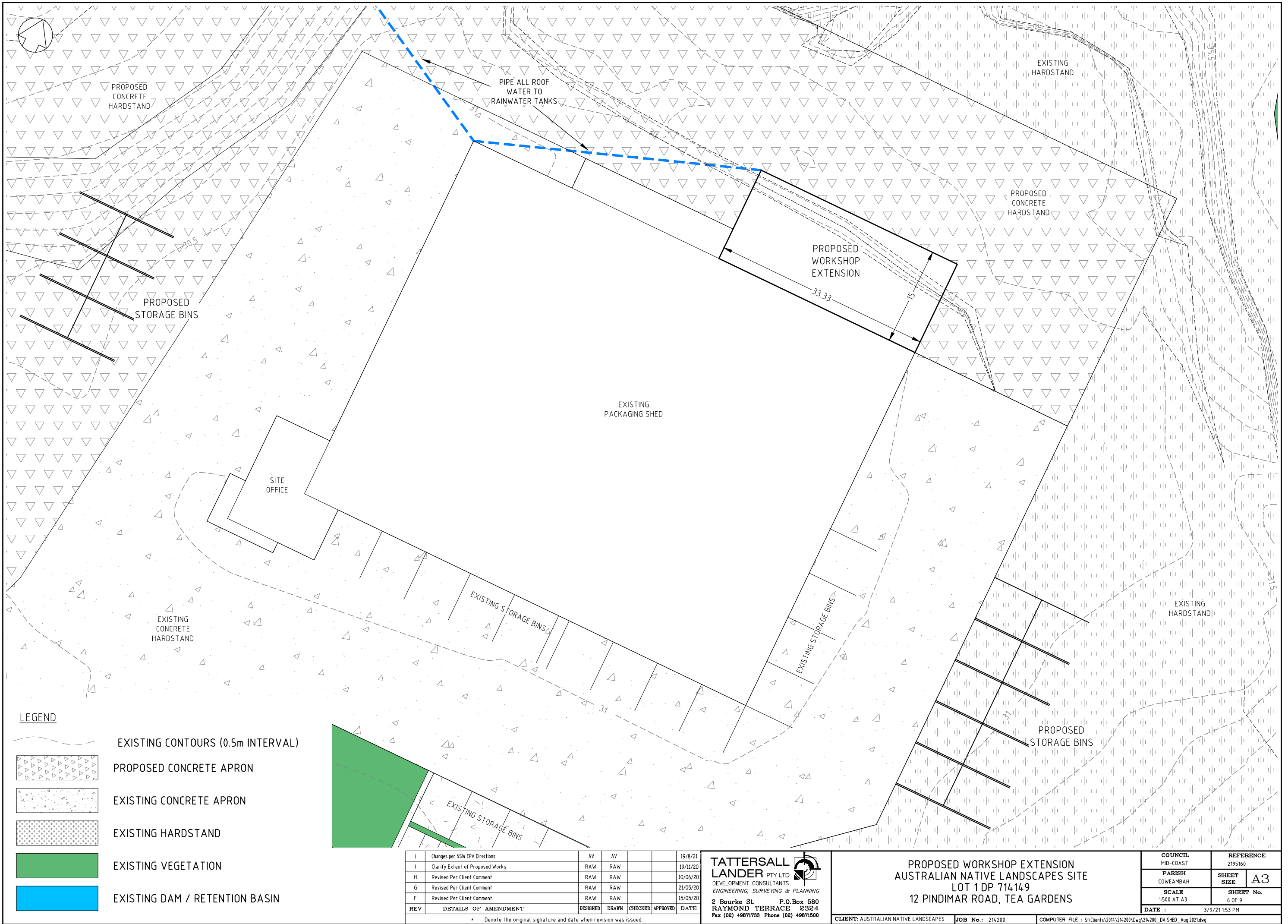
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REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
<p style="text-align: center;">* Denote the original signature and date when revision was issued.</p>						











LEGEND

- EXISTING CONTOURS (0.5m INTERVAL)
- PROPOSED CONCRETE APRON
- EXISTING CONCRETE APRON
- EXISTING HARDSTAND
- EXISTING VEGETATION
- EXISTING DAM / RETENTION BASIN

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I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

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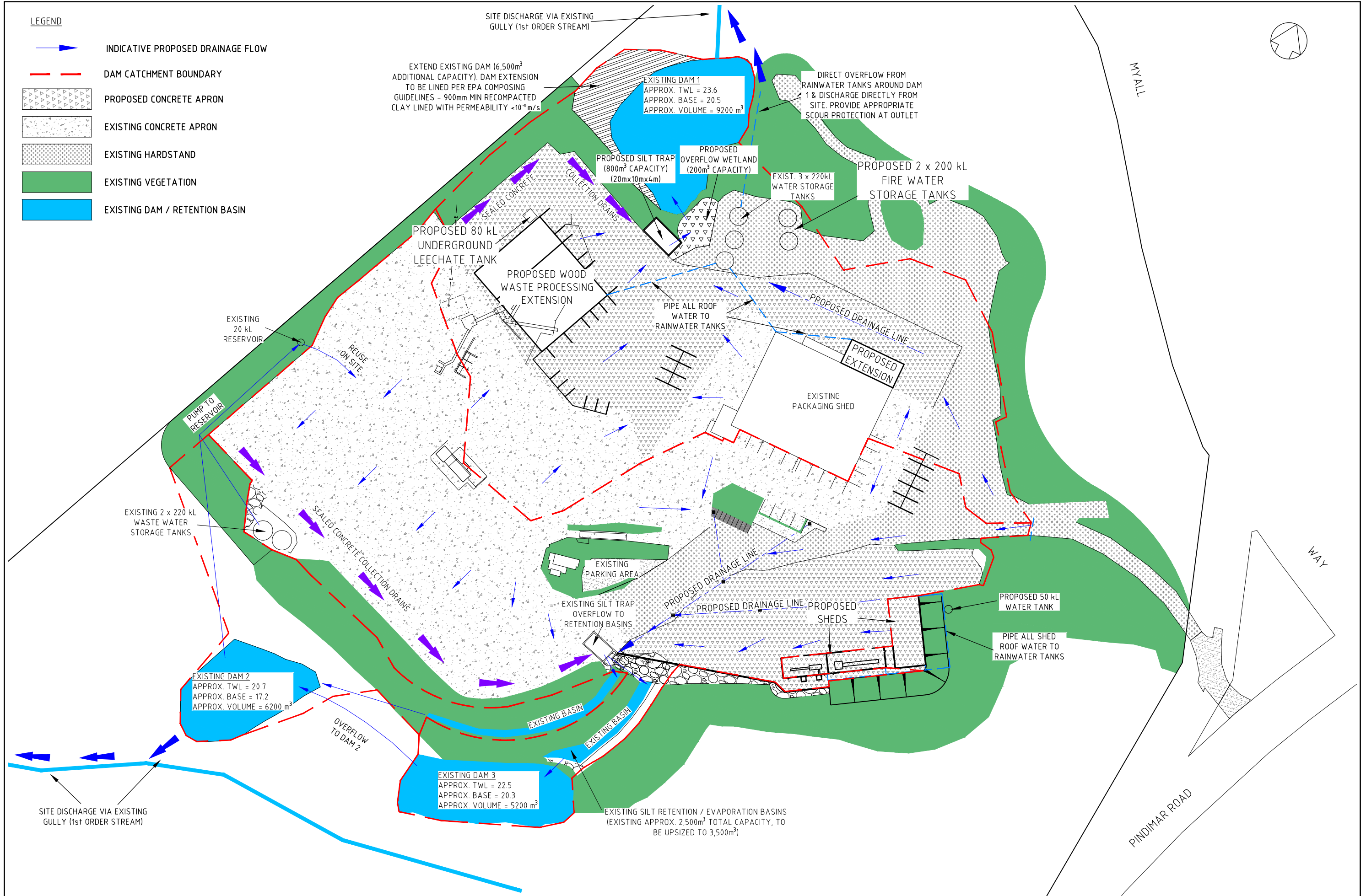
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12 PINDIMAR ROAD, TEA GARDENS

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PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1500 AT A3	SHEET No. 6 OF 9
DATE : 3/9/21 1:53 PM	

CLIENT: AUSTRALIAN NATIVE LANDSCAPES JOB No.: 214200 COMPUTER FILE : S:\Clients\2014\214200\DWG\214200\_DA SHED\_Aug 2021.dwg



- LEGEND
- INDICATIVE PROPOSED DRAINAGE FLOW
  - DAM CATCHMENT BOUNDARY
  - PROPOSED CONCRETE APRON
  - EXISTING CONCRETE APRON
  - EXISTING HARDSTAND
  - EXISTING VEGETATION
  - EXISTING DAM / RETENTION BASIN



J	Changes per NSW EPA Directions	AV	AV		19/8/21
I	Clarify Extent of Proposed Works	RAW	RAW		19/11/20
H	Revised Per Client Comment	RAW	RAW		10/06/20
G	Revised Per Client Comment	RAW	RAW		21/05/20
F	Revised Per Client Comment	RAW	RAW		15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED

\* Denote the original signature and date when revision was issued.

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PROPOSED DRAINAGE SITE PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

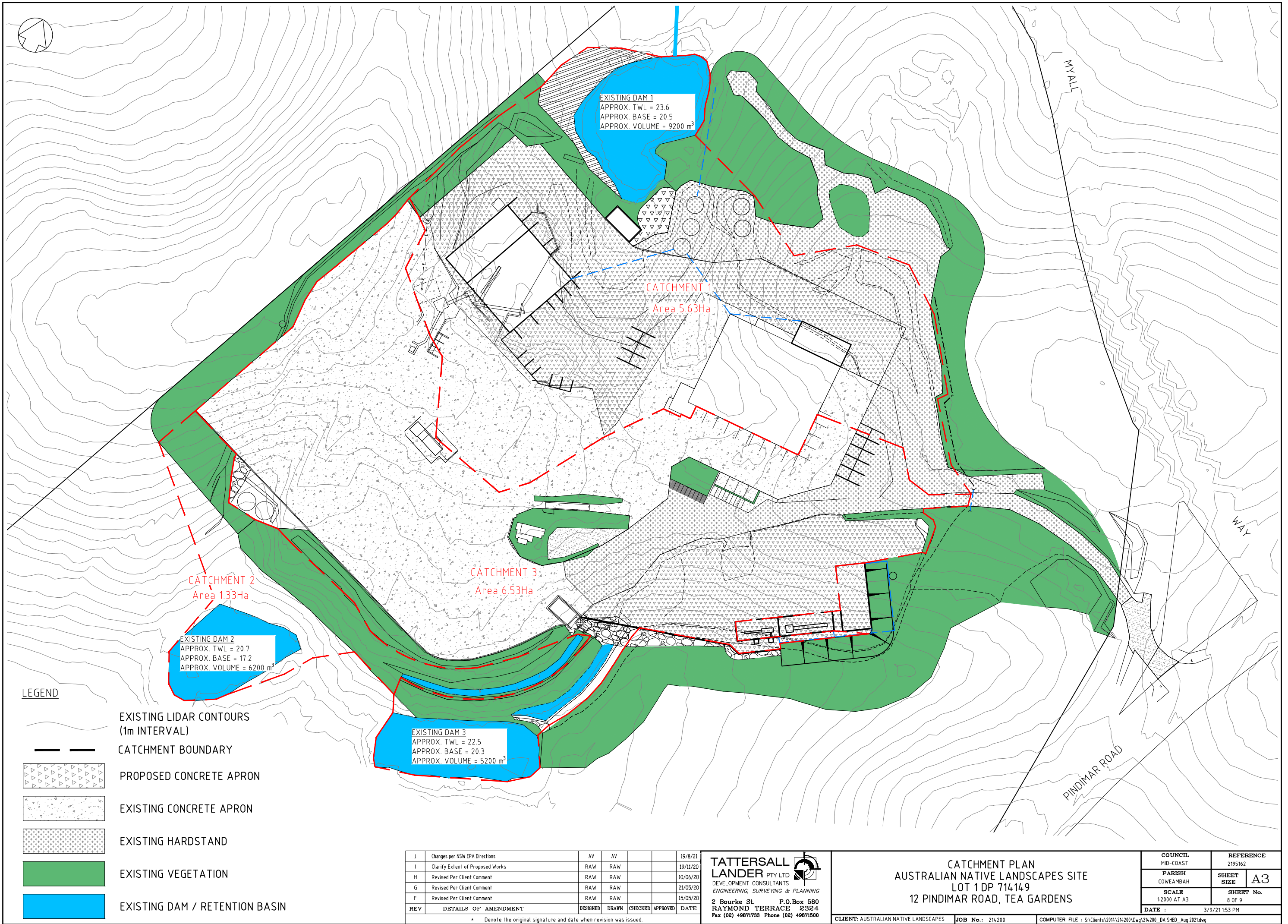
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PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 7 OF 9
DATE : 3/9/21 1:53 PM	





LEGEND

- EXISTING LIDAR CONTOURS (1m INTERVAL)
- CATCHMENT BOUNDARY
- PROPOSED CONCRETE APRON
- EXISTING CONCRETE APRON
- EXISTING HARDSTAND
- EXISTING VEGETATION
- EXISTING DAM / RETENTION BASIN

J	Changes per NSW EPA Directions	AV	AV			19/8/21
I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

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RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500



CATCHMENT PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

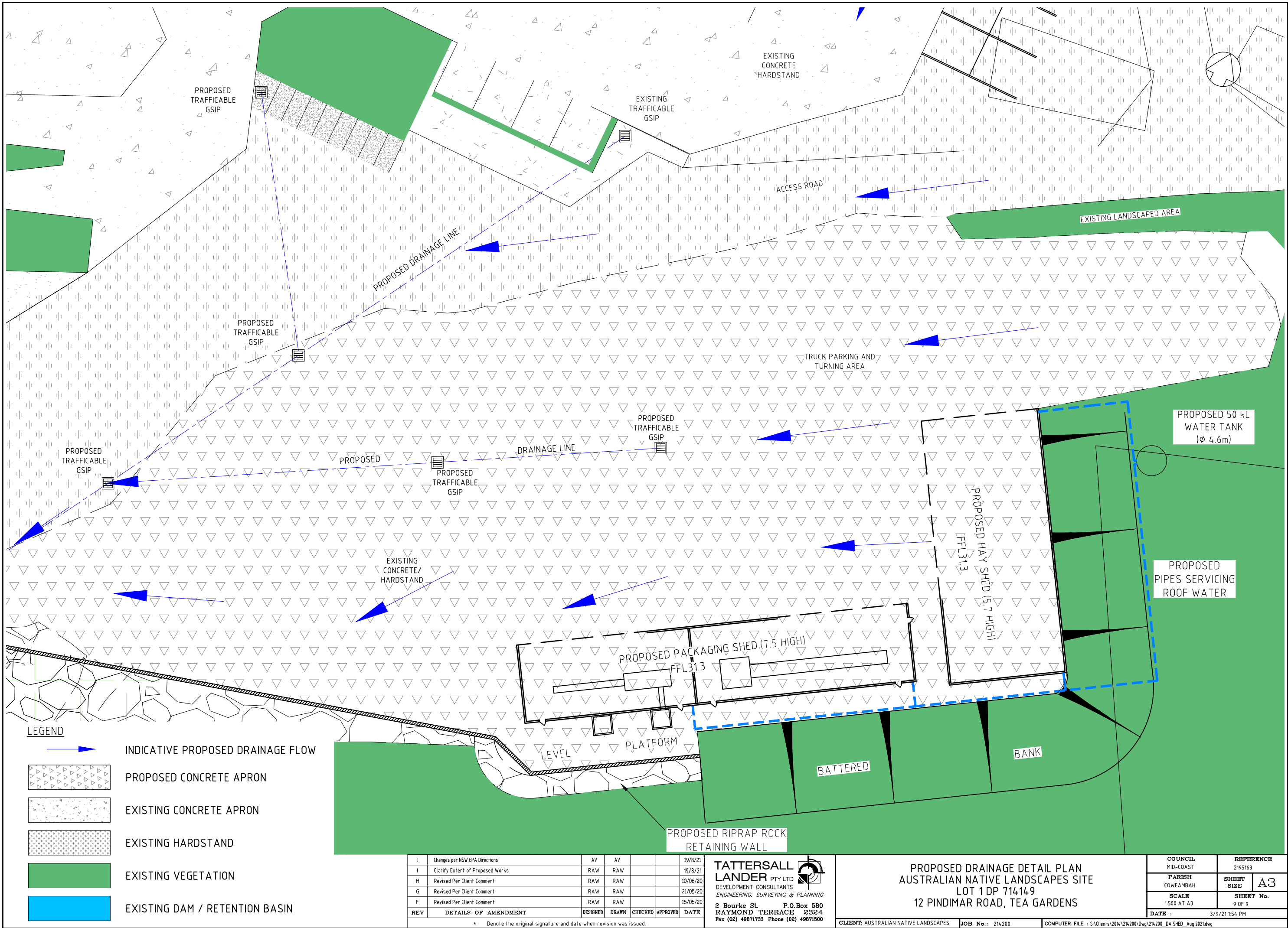
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PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 8 OF 9
DATE : 3/9/21 1:53 PM	





**LEGEND**

- INDICATIVE PROPOSED DRAINAGE FLOW
- PROPOSED CONCRETE APRON
- EXISTING CONCRETE APRON
- EXISTING HARDSTAND
- EXISTING VEGETATION
- EXISTING DAM / RETENTION BASIN

J	Changes per NSW EPA Directions	AV	AV			19/8/21
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REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
* Denote the original signature and date when revision was issued.						

\* Denote the original signature and date when revision was issued.








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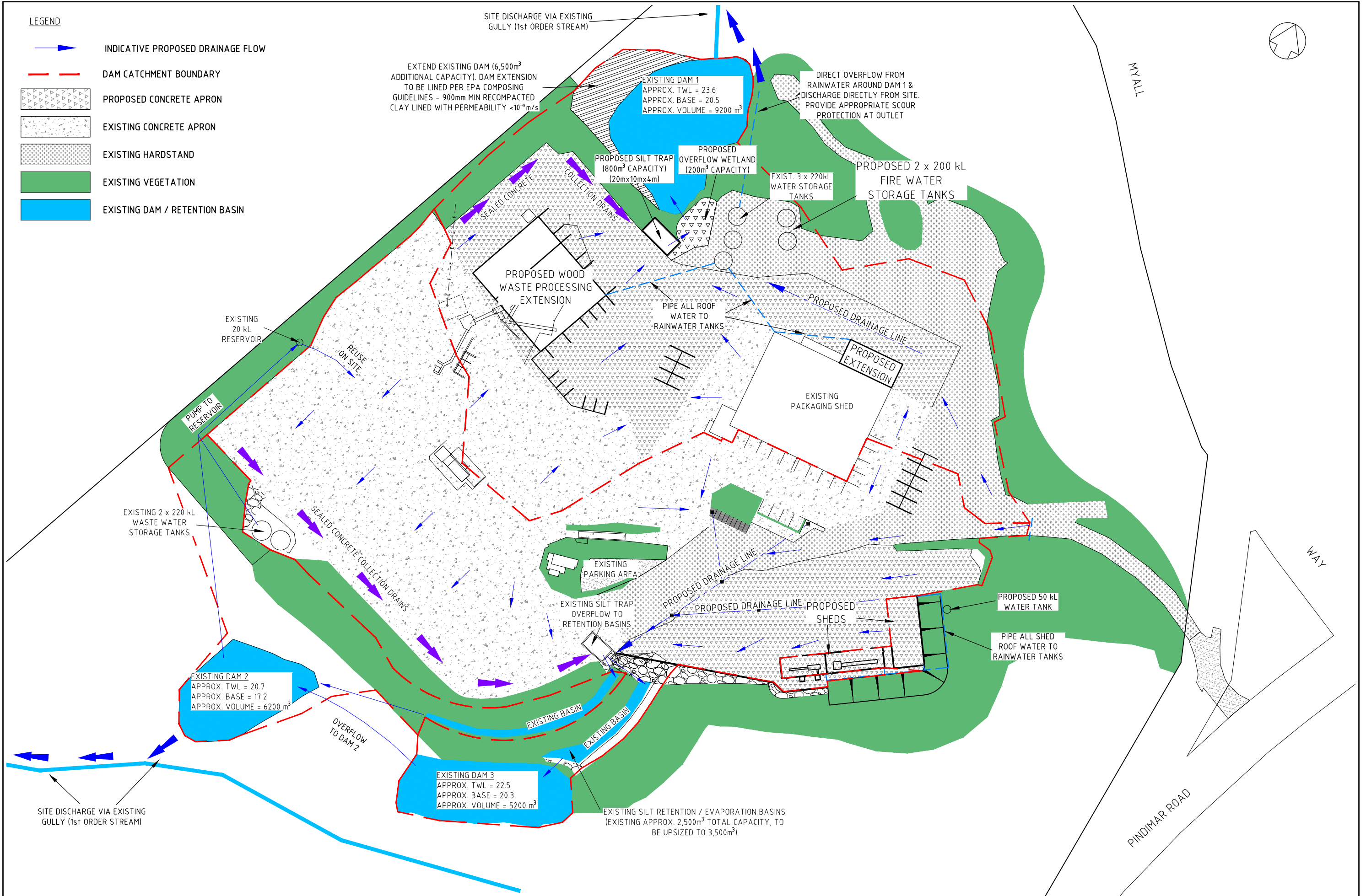
**PROPOSED DRAINAGE DETAIL PLAN**  
**AUSTRALIAN NATIVE LANDSCAPES SITE**  
**LOT 1 DP 714149**  
**12 PINDIMAR ROAD, TEA GARDENS**

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PARISH COWEAMBAH	SHEET SIZE A3
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DATE : 3/9/21 1:54 PM	

## APPENDIX E: STORMWATER CONCEPT PLAN

LEGEND

-  INDICATIVE PROPOSED DRAINAGE FLOW
-  DAM CATCHMENT BOUNDARY
-  PROPOSED CONCRETE APRON
-  EXISTING CONCRETE APRON
-  EXISTING HARDSTAND
-  EXISTING VEGETATION
-  EXISTING DAM / RETENTION BASIN



J	Changes per NSW EPA Directions	AV	AV			19/8/21
I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

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ENGINEERING, SURVEYING & PLANNING  
2 Bourke St. P.O. Box 580  
RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500

PROPOSED DRAINAGE SITE PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

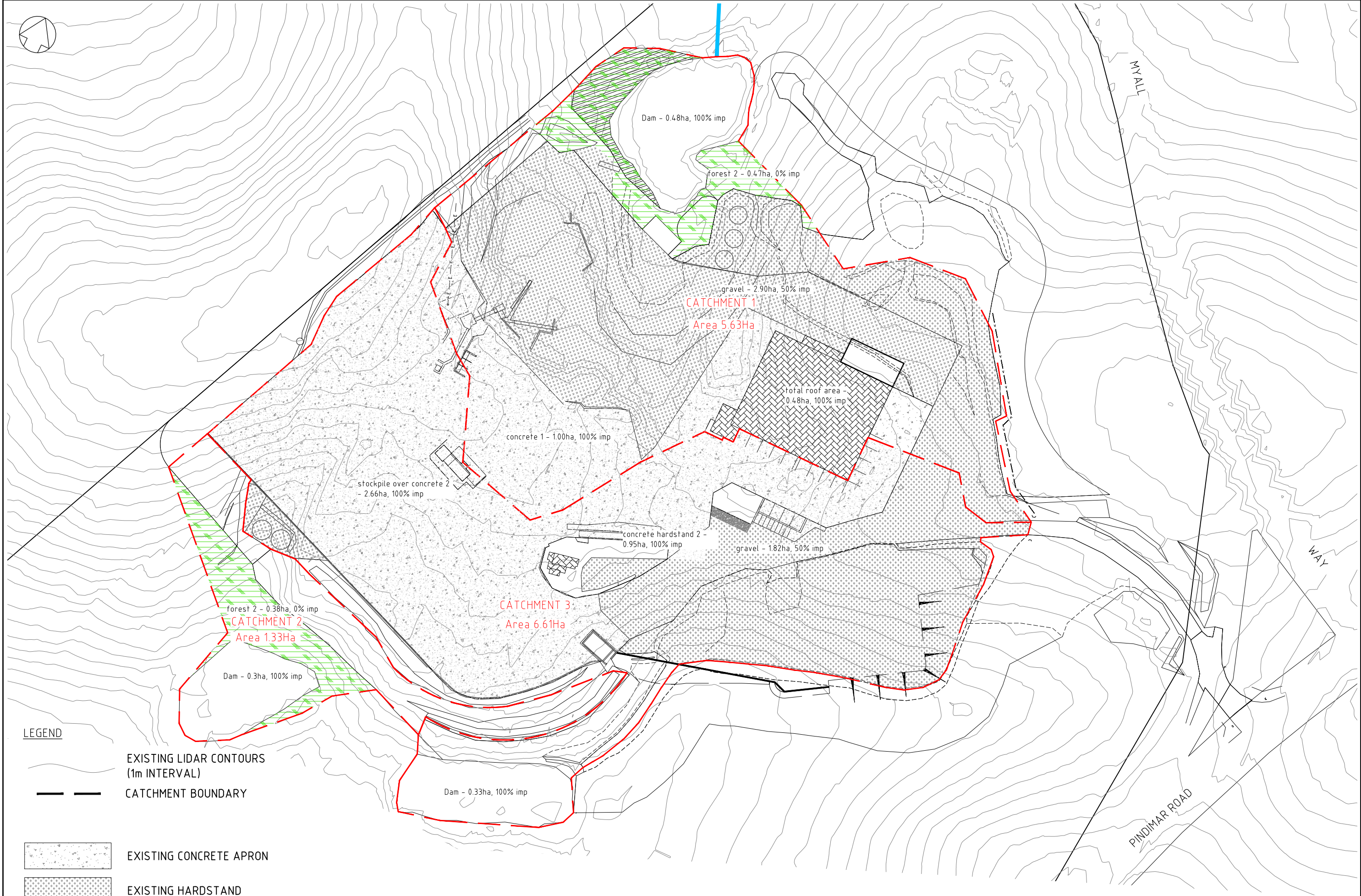
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JOB No.: 214200

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DATE : 08/19/21 18:55:51	





LEGEND

- EXISTING LIDAR CONTOURS (1m INTERVAL)
- CATCHMENT BOUNDARY
- EXISTING CONCRETE APRON
- EXISTING HARDSTAND
- EXISTING VEGETATION
- EXISTING DAM / RETENTION BASIN

I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

TATTERSALL  
LANDER PTY LTD  
DEVELOPMENT CONSULTANTS  
ENGINEERING, SURVEYING & PLANNING  
2 Bourke St. P.O.Box 580  
RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500

EXISTING SITE CATCHMENT PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

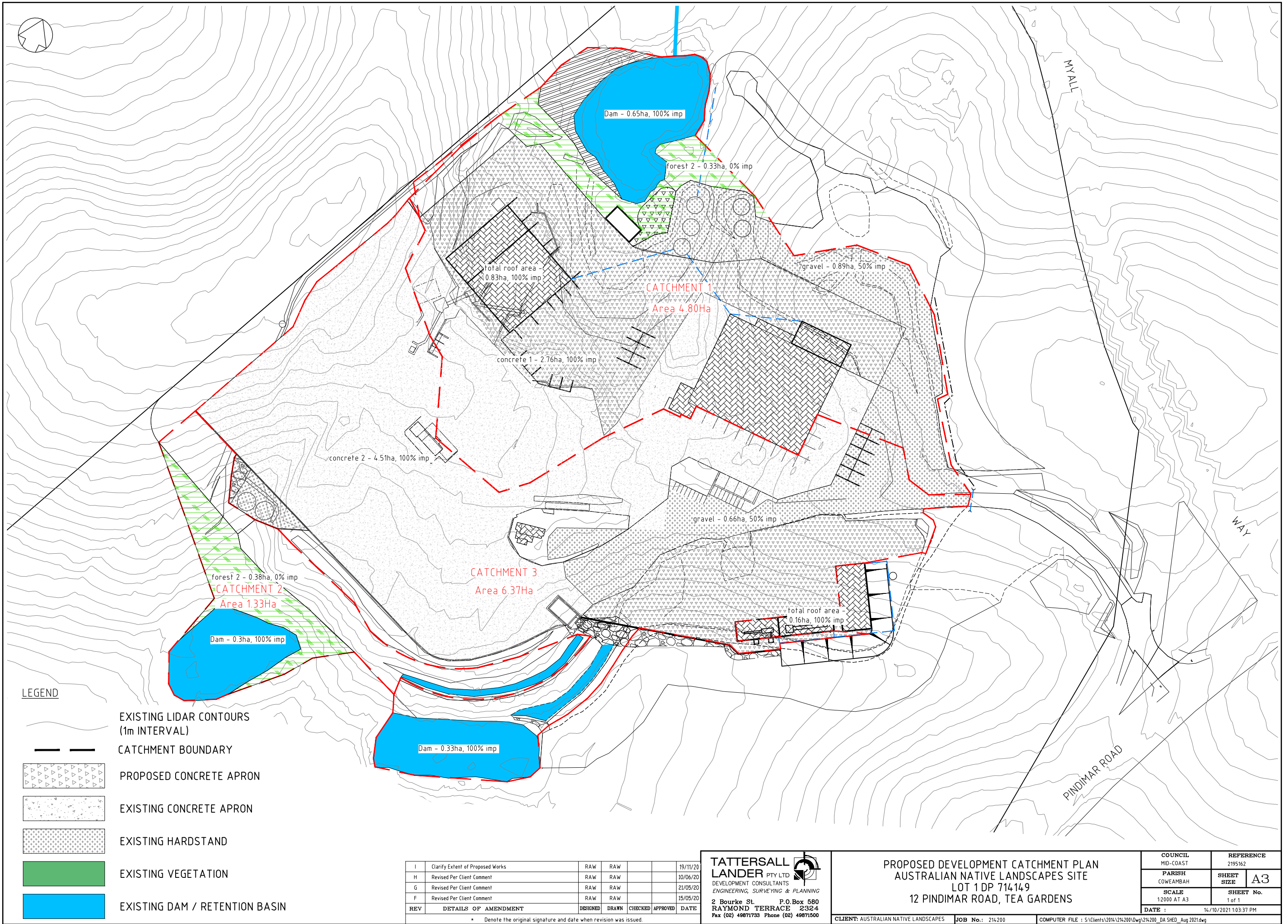
COUNCIL MID-COAST	REFERENCE 2195162
PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 1 of 1
DATE : 14/10/2021 10:12 PM	

CLIENT: AUSTRALIAN NATIVE LANDSCAPES

JOB No.: 214200

COMPUTER FILE : S:\Clients\2014\214200\Drawings\214200 DA SHED Aug 2021.dwg





I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

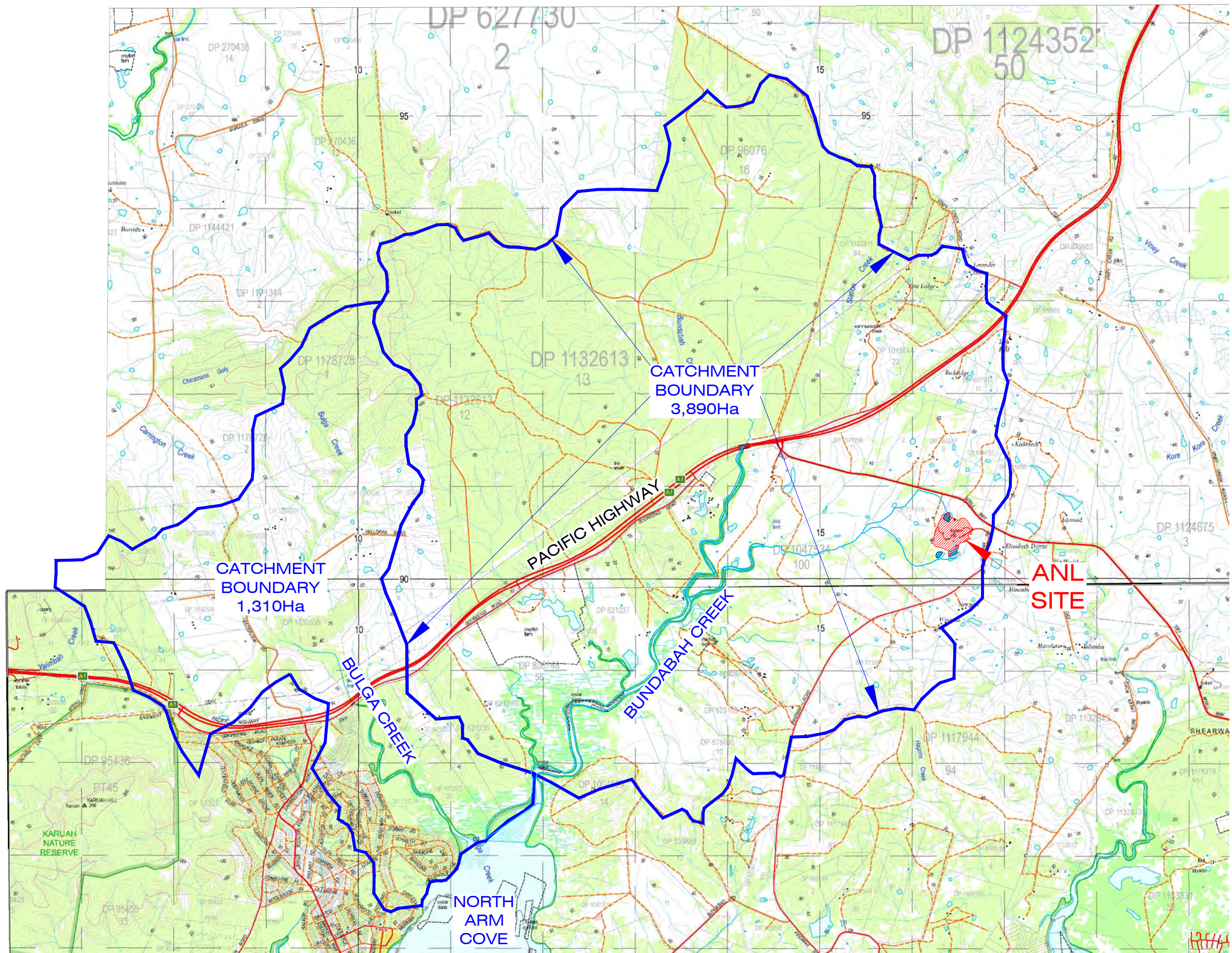
**TATTERSALL LANDER** PTY LTD  
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RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500

**PROPOSED DEVELOPMENT CATCHMENT PLAN**  
**AUSTRALIAN NATIVE LANDSCAPES SITE**  
**LOT 1 DP 714149**  
**12 PINDIMAR ROAD, TEA GARDENS**

**CLIENT:** AUSTRALIAN NATIVE LANDSCAPES **JOB No.:** 214200 **COMPUTER FILE :** S:\Clients\2014\214200\Drawings\214200\_DA SHED\_Aug 2021.dwg

<b>COUNCIL</b> MID-COAST	<b>REFERENCE</b> 2195162
<b>PARISH</b> COWEAMBAH	<b>SHEET SIZE</b> A3
<b>SCALE</b> 1:2000 AT A3	<b>SHEET No.</b> 1 of 1
<b>DATE :</b>	14/10/2021 1:03:37 PM





I	Clarify Extent of Proposed Works	RAW	RAW			19/11/20
H	Revised Per Client Comment	RAW	RAW			10/06/20
G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

**TATTERSALL  
LANDER** PTY LTD  
DEVELOPMENT CONSULTANTS  
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2 Bourke St. P.O.Box 580  
RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500



REGIONAL CATCHMENT CONTEXT PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

CLIENT: AUSTRALIAN NATIVE LANDSCAPES

JOB No.: 214200

COMPUTER FILE: S:\Clients\2014\214200\DWG\214200\_DA SHED\_Aug 2021.dwg

COUNCIL MID-COAST	REFERENCE 2195161
PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 1 of 1
DATE : 14/10/2021 1:05:09 PM	



## APPENDIX F: SUMMARY OF STORMWATER ONSITE REUSE ASSUMPTIONS

The operator has supplied the following data summarising the expected reuse rates on the site;

1. **New 40,000 tonne shredder** (per DA9/2021) = 40,000 tonne/yr x 3.5 cu.m/tonne = 140,000 cu.m/yr x 0.15kl / cu.m = 21,000kL/yr = 57.53kl/day. The material once stabilised (pasteurised) after 4 weeks will weigh 2.5 cubic meters to the tonne and will reduce in volume from 140,000 cubic meters to approximately 100,000 cubic meters and under strict controls add an additional 0.1kL/cu.m = 10,000kL/yr = 27.4kL/day. 57.53 + 27.4 = Total 84.93kL/day.

Under the current FOGO application, capacity will increase to 50,000t, with corresponding increase in usage to a total of 106.16kL/day.

2. **Yard, driveway general dust control** – Current usage = Water truck at 15,000 litres per load x average of 6 loads per day x 5.5 days = 495,000 litres per week x 45 weeks (to allow for wet weather) = 22,275 kL/yr. (Distributed 'PET-rainfall' in MUSIC).

The approved DA9/2021 will increase to 8 loads per day with new DA = 29,700kL/yr. There will be no change as a result of the current FOGO application.

3. **Mulch Colouring** - ANL currently uses approximately 200l/cu.m in the mulch colouring process and currently colours approximately 30,000 cubic meters per annum = 16.44kL/day.

The approved DA9/2021 increased this by 33% = 21.86kL/day.

ANL is also currently installing a new automated bagging line that will increase production by a further 10%, so to most accurately reflect the ultimate usage rates while the FOGO facility is operating, this model has adopted 24.05kL/day for mulch colouring processes.

4. **Potting Mix and Mulch Products** – ANL currently uses approximately 1 x 15,000 litre tanker per day x 5.5 days x 45 weeks per annum (to allow for wet weather) = 3,712kL/yr (Distributed 'PET-rainfall' in MUSIC).

The approved DA9/2021 increased this by 33% = 4,937kL/yr.

The new automated bagging line will increase this a further 10% = 5,430kL/yr

5. **Landscape Irrigation** - ANL uses an average 15,000 litres 2 x times per week on irrigating ANL landscaped plants - 30,000 litres x 45 weeks (to allow for wet weather) = 1,350 kL/yr. (Distributed 'PET-rainfall' in MUSIC).

This remains unchanged by DA9/2021 and the current FOGO application.

## APPENDIX G: BOM ARR16 RAINFALL DATA

2/29/24, 4:58 PM

Rainfall IFD Data System: Water Information: Bureau of Meteorology



Australian Government  
Bureau of Meteorology

### Location

**Label:** Not provided

**Latitude:** -32.6204 [Nearest grid cell: 32.6125 (S)]

**Longitude:** 152.1095 [Nearest grid cell: 152.1125 (E)]

### IFD Design Rainfall Depth (mm)

Issued: 29 February 2024

Rainfall depth for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).

[FAQ for New ARR probability terminology](#)

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
<b>1 min</b>	2.25	2.60	3.78	4.65	5.55	6.84	7.89
<b>2 min</b>	3.74	4.36	6.41	7.88	9.40	11.5	13.2
<b>3 min</b>	5.21	6.06	8.87	10.9	13.0	15.9	18.3
<b>4 min</b>	6.55	7.60	11.1	13.7	16.3	20.0	23.0
<b>5 min</b>	7.77	9.00	13.1	16.1	19.2	23.6	27.2
<b>10 min</b>	12.4	14.3	20.8	25.6	30.6	37.6	43.5
<b>15 min</b>	15.6	18.0	26.1	32.1	38.4	47.3	54.7
<b>20 min</b>	17.9	20.8	30.2	37.1	44.4	54.7	63.2
<b>25 min</b>	19.8	23.0	33.4	41.1	49.2	60.6	70.0
<b>30 min</b>	21.4	24.8	36.2	44.5	53.2	65.5	75.6
<b>45 min</b>	25.1	29.1	42.5	52.3	62.4	76.8	88.6
<b>1 hour</b>	27.8	32.3	47.2	58.0	69.3	85.2	98.1
<b>1.5 hour</b>	32.0	37.1	54.2	66.7	79.6	97.7	112
<b>2 hour</b>	35.3	41.0	59.7	73.4	87.6	107	124
<b>3 hour</b>	40.7	47.1	68.5	84.1	100	123	141
<b>4.5 hour</b>	47.2	54.5	78.8	96.5	115	141	162
<b>6 hour</b>	52.7	60.7	87.3	107	127	156	179
<b>9 hour</b>	62.0	71.0	101	124	147	180	208
<b>12 hour</b>	69.7	79.6	113	138	163	201	231
<b>18 hour</b>	82.3	93.7	132	161	190	234	270
<b>24 hour</b>	92.4	105	148	179	212	260	301
<b>30 hour</b>	101	115	161	194	230	283	327
<b>36 hour</b>	108	123	172	208	245	302	349
<b>48 hour</b>	119	136	190	229	270	332	384
<b>72 hour</b>	135	154	215	259	305	375	432
<b>96 hour</b>	146	166	232	279	327	402	463
<b>120 hour</b>	154	175	243	293	343	419	482

2/29/24, 4:58 PM

Rainfall IFD Data System: Water Information: Bureau of Meteorology

<b>144 hour</b>	159	181	251	302	353	431	494
<b>168 hour</b>	163	185	257	308	360	438	501

Note:

# The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD.  
Rather it corresponds to the 1.44 ARI.

\* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD.  
Rather it corresponds to the 4.48 ARI.

This page was created at **17:02 on Thursday 29 February 2024 (AEDT)**

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## APPENDIX H: SAMPLE MONITORING AND TEST RECORDS



WATER STORAGE TG				WATER USAGE	DUST SUPPRESSION	RAINFALL	Weather
DATE	DAM 1	DAM 2	DAM 3	WINDROW HOURS		MLS	WIND DIRECTION
Feb-24							
1/02/2024							
2/02/2024							
3/02/2024							
4/02/2024							
5/02/2024	80.00%	4.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		
6/02/2024	80.00%	4.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS SSW 8 KM/H TODAY WIND SPEEDS ARE 4 TO 23 KM/H WITH GUSTS UP TO 47 KM/H
7/02/2024	80.00%	4.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	21 ML	WIND IS S 13 KM/H TODAYS WIND SPEEDS ARE 13 TO 17 KM/H WITH GUSTS UP TO 34 KM/H
8/02/2024	80.00%	5.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	6 ML	WIND IS SSE 15 KM/H TODAYS WIND SPEEDS ARE 10 TO 18 KM/H WITH GUSTS UP TO 37 KM/H
9/02/2024	80.00%	5.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS SW 9 KM/H TODAYS WIND SPEEDS ARE 7 TO 16 KM/H WITH GUSTS UP TO 33 KM/H
10/02/2024							
11/02/2024							
12/02/2024	80.00%	8.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	10 ML	WIND IS NNE 5 KM/H TODAYS WIND SPEEDS ARE 5 TO 20 KM/H WITH DUSTS UP TO 38 KM/H
13/02/2024	80.00%	8.00%	70.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS NNE 14 KM/H TODAY WIND SPEEDS ARE 11 TO 21 KM/H WITH GUSTS UP TO 44 KM/H
14/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS N 8 KM/H TODAY WIND SPEEDS ARE 5 TO 14 KM/H WITH GUSTS UP TO 34 KM/H
15/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	6 ML	WIND IS SE 9 KM/H TODAYS WIND SPEEDS ARE 8 TO 13 KM/H WITH GUSTS UP TO 30 KM/H
16/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	4 ML	WIND IS NE 5 KM/H TODAYS WIND SPEEDS ARE 4 TO 14 KM/H WITH GUSTS UP TO 33 KM/H
17/02/2024							
18/02/2024							
19/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS 3 KM/H TODAYS WIND SPEEDS ARE 3 TO 9 KM/H WITH GUSTS UP TO 21 KM/H
20/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	8 ML	WIND IS WSW 4 KM/H WIND SPEEDS ARE 3 TO 11 KM/H WITH GUSTS UP TO 24 KM/H
21/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS WNW 5 KM/H WIND SPEEDS ARE 2 TO 11 KM/H WITH GUSTS UP TO 22 KM/H
22/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS WNW 4 KM/H WIND SPEEDS ARE 2 TO 14 KM/H WITH GUSTS UP TO 29 KM/H
23/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS NNW 6 KM/H WIND SPEEDS ARE 4 TO 13 KM/H WITH GUSTS UP TO 33 KM/H
24/02/2024							
25/02/2024							
26/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE	8 ml	WIND IS NW 5 KM/H TODAY WIND SPEEDS ARE 4 TO 14 KM/H WITH GUSTS UP TO 29 KM/H
27/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS SE 6 KM/H TODAY WIND SPEEDS ARE 3 TO 15 KM/H WITH GUSTS UP TO 32 KM/H
28/02/2024	80.00%	8.00%	65.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND IS NE 9 KM/H TODAY WIND SPEEDS ARE 8 TO 20 KM/H WITH GUSTS UP TO 40 KM/H
29/02/2024	80.00%	8.00%	60.00%	WATER ON SAWDUST 2 X 20.000 H/S	2 X 20.000 D/S 1 X 20.000 ON GREENWASTE		WIND NNE 9 KM/H TODAY WIND SPEEDS ARE 6 TO 14 KM/H WITH GUSTS UP TO 32 KM/H

02 8900 8400 [finvest@smptst157@eurofin.com](mailto:finvest@smptst157@eurofin.com)

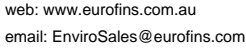
07 300 4000 [EnergySolutions24.co.uk](http://EnergySolutions24.co.uk)

08 925 9600 [Enquiries@sampleitanddesign.com](mailto:Enquiries@sampleitanddesign.com)

03.8534.9000 [EssexSamples@officesupplies.com](mailto:EssexSamples@officesupplies.com)

Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of the following Environmental Testing Standard Terms and Conditions, unless noted otherwise. A copy is available on request.



ABN: 50 005 085 521

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Mayfield West NSW 2304  
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NATA# 1261  
94 Site# 25079 & 25289

ABN: 91 05 0159 898

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Tel: +61 8 6253 4444  
NATA# 2377 Site# 2370

NZBN: 9429046024954

<b>Auckland</b>	<b>Christchurch</b>
35 O'Rourke Road	43 Detroit Drive
Penrose,	Rolleston,
Auckland 1061	Christchurch 7675
Tel: +64 9 526 45 51	Tel: 0800 856 450
IANZ# 1327	IANZ# 1290

**Received:** Feb 21, 2023 3:06 PM  
**Due:** Mar 8, 2023  
**Priority:** 5 Day  
**Contact Name:** John Batman

**Eurofins Analytical Services Manager : Andrew Black**

[illegible]

**Australian Native Landscapes NSW**  
**1 Pindimar Road**  
**Tea Gardens**  
**NSW 2324**

**Attention:** **John Batman**

**Report** **968551-W**  
Project name **DAM 2 AND 3**  
Project ID **DAM 2 AND 3**  
Received Date **Feb 21, 2023**

Client Sample ID			<b>DAM 1</b>	<b>DAM 2</b>
Sample Matrix			<b>Water</b>	<b>Water</b>
Eurofins Sample No.			<b>S23-Ma0005964</b>	<b>S23-Ma0005965</b>
Date Sampled			<b>Feb 08, 2023</b>	<b>Feb 08, 2023</b>
Test/Reference	LOR	Unit		
Chloride	1	mg/L	17	190
Nitrate (as N)	0.02	mg/L	1.0	0.20
pH (at 25 °C)	0.1	pH Units	2.7	2.7
Phosphate total (as P)	0.01	mg/L	0.20	2.7
Sugar *		mg/L		
Sulphate (as SO4)	2	mg/L	100	390
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	120	46
<b>Heavy Metals</b>				
Lead	0.001	mg/L	0.002	0.001
Zinc	0.005	mg/L	0.021	0.008
<b>Alkali Metals</b>				
Potassium	0.5	mg/L	2.6	190
Sodium	0.5	mg/L	23	78

**Sample History**

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Mar 03, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Nitrate (as N)	Melbourne	Mar 06, 2023	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
pH (at 25 °C)	Sydney	Mar 03, 2023	0 Hour
- Method: LTM-GEN-7090 pH in water by ISE			
Phosphate total (as P)	Sydney	Mar 03, 2023	28 Days
- Method: E052 Total Phosphate (as P)			
Sugar *	Melbourne	Mar 06, 2023	5 Days
- Method: Sugar by UV - Crop Science Vol.41, Jan-Feb 2001 by Geater, Fehr, Wilson and Robyt			
Sulphate (as SO4)	Sydney	Mar 03, 2023	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
Total Suspended Solids Dried at 103 °C to 105 °C	Sydney	Mar 03, 2023	7 Days
- Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry			
Heavy Metals	Sydney	Mar 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkali Metals	Sydney	Mar 03, 2023	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

LABORATORY



**Company Name:** Australian Native Landscapes NSW  
**Address:** 1 Pindimar Road  
Tea Gardens  
NSW 2324  
**Project Name:** DAM 2 AND 3  
**Project ID:** DAM 2 AND 3

**Order No.:**  
**Report #:** 968551  
**Phone:** 0498 655 499  
**Fax:**

**Received:** Feb 21, 2023 3:06 PM  
**Due:** Mar 8, 2023  
**Priority:** 5 Day  
**Contact Name:** John Batman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Chloride	Lead	Nitrate (as N)	pH (at 25 °C)	Phosphate total (as P)	Potassium	Sodium	Sugar *	Sulphate (as SO <sub>4</sub> )	Total Suspended Solids Dried at 103 °C to 105 °C	Zinc
Melbourne Laboratory - NATA # 1261 Site # 1254								X					X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X		X	X	X	X		X	X	X
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	DAM 1	Feb 08, 2023		Water	S23-Ma0005964	X	X	X	X	X	X	X	X	X	X	X
2	DAM 2	Feb 08, 2023		Water	S23-Ma0005965	X	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2	2

## Internal Quality Control Review and Glossary

### General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

### Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

### Units

<b>mg/kg:</b> milligrams per kilogram	<b>mg/L:</b> milligrams per litre	<b>µg/L:</b> micrograms per litre
<b>ppm:</b> parts per million	<b>ppb:</b> parts per billion	<b>%:</b> Percentage
<b>org/100 mL:</b> Organisms per 100 millilitres	<b>NTU:</b> Nephelometric Turbidity Units	<b>MPN/100 mL:</b> Most Probable Number of organisms per 100 millilitres
<b>CFU:</b> Colony forming unit		

### Terms

<b>APHA</b>	American Public Health Association
<b>COC</b>	Chain of Custody
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>CRM</b>	Certified Reference Material (ISO17034) - reported as percent recovery.
<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>LOR</b>	Limit of Reporting.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>Method Blank</b>	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
<b>NCP</b>	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>SRA</b>	Sample Receipt Advice
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>TBTO</b>	Tributyltin oxide ( <i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>TEQ</b>	Toxic Equivalency Quotient or Total Equivalence
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.4
<b>US EPA</b>	United States Environmental Protection Agency
<b>WA DWER</b>	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

### QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

### QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

**Quality Control Results**

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>								
Chloride			mg/L	< 1		1	Pass	
Nitrate (as N)			mg/L	< 0.02		0.02	Pass	
Phosphate total (as P)			mg/L	< 0.01		0.01	Pass	
Sulphate (as SO <sub>4</sub> )			mg/L	< 2		2	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C			mg/L	< 5		5	Pass	
<b>Method Blank</b>								
<b>Heavy Metals</b>								
Lead			mg/L	< 0.001		0.001	Pass	
Zinc			mg/L	< 0.005		0.005	Pass	
<b>Method Blank</b>								
<b>Alkali Metals</b>								
Potassium			mg/L	< 0.5		0.5	Pass	
Sodium			mg/L	< 0.5		0.5	Pass	
<b>LCS - % Recovery</b>								
Chloride			%	99		70-130	Pass	
Nitrate (as N)			%	117		70-130	Pass	
Phosphate total (as P)			%	100		70-130	Pass	
Sulphate (as SO <sub>4</sub> )			%	98		70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C			%	95		70-130	Pass	
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Lead			%	89		80-120	Pass	
Zinc			%	87		80-120	Pass	
<b>LCS - % Recovery</b>								
<b>Alkali Metals</b>								
Potassium			%	114		80-120	Pass	
Sodium			%	118		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
				Result 1				
Nitrate (as N)	S23-Fe0061515	NCP	%	101		70-130	Pass	
Phosphate total (as P)	S23-Fe0061506	NCP	%	100		70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	S23-Ma0006094	NCP	%	96		70-130	Pass	
<b>Spike - % Recovery</b>								
				Result 1				
Potassium	S23-Fe0061502	NCP	%	109		75-125	Pass	
<b>Spike - % Recovery</b>								
				Result 1				
Chloride	S23-Ma0005965	CP	%	96		70-130	Pass	
Sulphate (as SO <sub>4</sub> )	S23-Ma0005965	CP	%	85		70-130	Pass	
<b>Spike - % Recovery</b>								
				Result 1				
Lead	S23-Ma0005965	CP	%	93		75-125	Pass	
Zinc	S23-Ma0005965	CP	%	99		75-125	Pass	
<b>Spike - % Recovery</b>								
				Result 1				
Sodium	S23-Ma0005965	CP	%	100		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
				Result 1	Result 2	RPD			
Nitrate (as N)	S23-Ma0001704	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phosphate total (as P)	S23-Fe0061518	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	N23-Ma0001268	NCP	mg/L	4200	4100	<1	30%	Pass	
<b>Duplicate</b>									
<b>Heavy Metals</b>				Result 1	Result 2	RPD			
Lead	S23-Ma0006507	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S23-Ma0006507	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
<b>Duplicate</b>									
<b>Alkali Metals</b>				Result 1	Result 2	RPD			
Potassium	S23-Ma0006507	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Sodium	S23-Ma0006507	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	

DRAFT

**Comments**
**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

**Authorised by:**

Fang Yee Tan	Senior Analyst-Metal
Mary Makarios	Senior Analyst-Inorganic
Ryan Phillips	Senior Analyst-Inorganic

**Glenn Jackson**  
**General Manager**

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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## **APPENDIX K – ABORIGINAL AND HISTORIC HERITAGE DUE DILIGENCE ASSESSMENT**



View west towards the existing woodchip processing plant and chute.

## **ABORIGINAL DUE DILIGENCE & HISTORIC HERITAGE ASSESSMENT REPORT**

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### **ENCLOSED FOOD AND GARDENS ORGANICS COMPOSTING FACILITY – TEA GARDENS**

MID-COAST COUNCIL LOCAL GOVERNMENT AREA

MARCH 2024

Report prepared by  
OzArk Environment & Heritage  
for Australian Native Landscapes

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## DOCUMENT CONTROLS

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Client	Wedgetail Project Consulting	
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Enquiries should be addressed to OzArk Environment & Heritage.		

### **Acknowledgement**

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.



## EXECUTIVE SUMMARY

---

OzArk Environment & Heritage (OzArk) has been engaged by Wedgetail Project Consulting, on behalf of Australian Native Landscapes (the proponent) to complete an Aboriginal due diligence and historic heritage assessment for the Enclosed Food and Gardens Organics Composting Facility – Tea Gardens (the proposal). The proposal is in the Mid-Coast Council Local Government Area.

The proponent is currently operating a landscape supply facility in accordance with Development Consents (DA) 3264/1988, DA227/2015, and DA-9/2021. More recently, DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the planned wood waste processing building. It is proposed to repurpose and retrofit the planned wood waste processing building to operate mixed Food and Garden Organics (FOGO) composting operations, processing up to 50,000 tonnes per annum.

The proponent is seeking Designated Development approval for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Secretary Environmental Assessment Requirements (SEARs) for the proposal were received on 11 January 2024, requesting an assessment of Aboriginal and non-Aboriginal cultural heritage be included in the Environmental Impact Statement (EIS). This Aboriginal due diligence and historic heritage assessment report meets this requirement.

The project area is located at 12 Pindimar Road (Lot 1 DP714149), Tea Gardens, New South Wales, approximately 5.5 kilometres (km) southeast of the village of Tea Gardens. The project area is within land zoned RU2 – Rural Landscape and is bordered by land similarly zoned for rural use.

The study area of approximately 1.625 ha is within the larger project area. There will be no additional ground disturbance to the study area outside of what has already been approved in DA9/2021. However, there will be a change in the use of the wood waste processing building planned for this area, to facilitate the processing of mixed Food and Garden Organics (FOGO). All impacts will be within the approved development area; however, a site inspection was undertaken to satisfy the SEARs requirements and as a precautionary measure by the proponent to ensure Aboriginal objects are not harmed.

A search of the Aboriginal Heritage Information Management System (AHIMS) shows there are no previously recorded Aboriginal sites within the study area and there are no landforms with archaeological sensitivity, i.e. areas within 200 metres (m) of 'water'. However, to ensure that Aboriginal objects are not harmed, the proponent elected that the assessment should proceed to a visual inspection.

The visual inspection of the study area was undertaken on 23 February 2024 by OzArk Heritage Consultant, Dr. Bernadette Drabsch, with Shane Ping and Ray Feeney representing the Karuah Local Aboriginal Land Council. The inspection focused on areas subject to lower levels of disturbance. No Aboriginal objects or areas with the potential to contain subsurface deposits were identified.

The undertaking of the due diligence process resulted in the conclusion that no Aboriginal objects or intact archaeological deposits would be harmed by the proposal. This moves the proposal to the following outcome:

*An Aboriginal Heritage Impact Permit (AHIP) application is not necessary. Proceed with caution. If any Aboriginal objects are found, stop work, and notify Heritage NSW (02) 9873 8500 ([heritagemailbox@environment.nsw.gov.au](mailto:heritagemailbox@environment.nsw.gov.au)). If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW.*

To ensure the greatest possible protection of the area's Aboriginal cultural heritage values, the proposed work may proceed without further archaeological investigation under the following conditions:

- 1) All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects that may be in adjacent landforms. Should the parameters of the proposal extend beyond the assessed area, then further archaeological assessment may be required.
- 2) This Assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
- 3) Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (see **Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the *National Parks and Wildlife Act 1974* and the contents of the *Unanticipated Finds Protocol*.
- 4) The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

Recommendations concerning the historic values within the study area are as follows.

- 5) It is assessed that it will be very unlikely that significant historic items will be discovered within the study area. However, if potentially significant items are discovered, the *Historic Heritage Unanticipated Finds Protocol* (**Appendix 4**) should be followed.

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# 1 INTRODUCTION

---

## 1.1 BRIEF DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by Wedgetail Project Consulting (the client), on behalf of Australian Native Landscapes (ANL) (the proponent) to complete an Aboriginal due diligence and historic heritage assessment for the Enclosed FOGO Composting Facility – Tea Gardens (the proposal). The proposal is in the Mid-Coast Council Local Government Area (LGA) (**Figure 1-1**).

The proponent is currently operating a landscape supply facility in accordance with Development Consents 3264/1988, DA227/2015, and DA-9/2021. More recently, DA-9/2021 was modified in October 2023 to allow for minor changes to the size and layout of the planned wood waste processing building. It is proposed to repurpose and retrofit the planned wood waste processing building to operate mixed FOGO composting operations, processing up to 50,000 tonnes per annum (tpa).

The proponent is seeking Designated Development approval for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Secretary Environmental Assessment Requirements (SEARs) for the proposal were received on 11 January 2024, requesting an assessment of Aboriginal and non-Aboriginal cultural heritage be included in the Environmental Impact Statement (EIS). This Aboriginal due diligence and historic heritage assessment report will form part of the EIS being prepared by Wedgetail Project Consulting.



**Figure 1-1. Map showing the location of the proposal.**

## 1.2 BACKGROUND

The project area is located on a site with a long history of development and works have been carried out on the site since 1932. Early work included the planting of 16,000 acres of *Pinus elliotii* and subsequent processing of these trees via an on-site chip mill in 1979, after a substantial bushfire. In 1988 the project area was approved (DA3264/1988) as a wood chipping plant, operated by Boral Timber.

The site was sold in 2014 to ANL and a new DA227/2015 was approved for 'Landscape material supplies, packaging shed and maintenance facility, managers residence and associated works.

DA9/2021 approved 'Alterations and additions to existing operations, the inclusion of wood waste processing and ancillary works. In particular, DA9/2021 approved the construction of a rural building for the processing of wood waste within an enclosed structure. It is this building that the current proposal relates to.

## 1.3 PROJECT AREA

The project area is located at 12 Pindimar Road (Lot 1 DP714149), Tea Gardens, New South Wales, approximately 5.5 kilometres (km) southeast of the village of Tea Gardens. The project





## 1.4 STUDY AREA

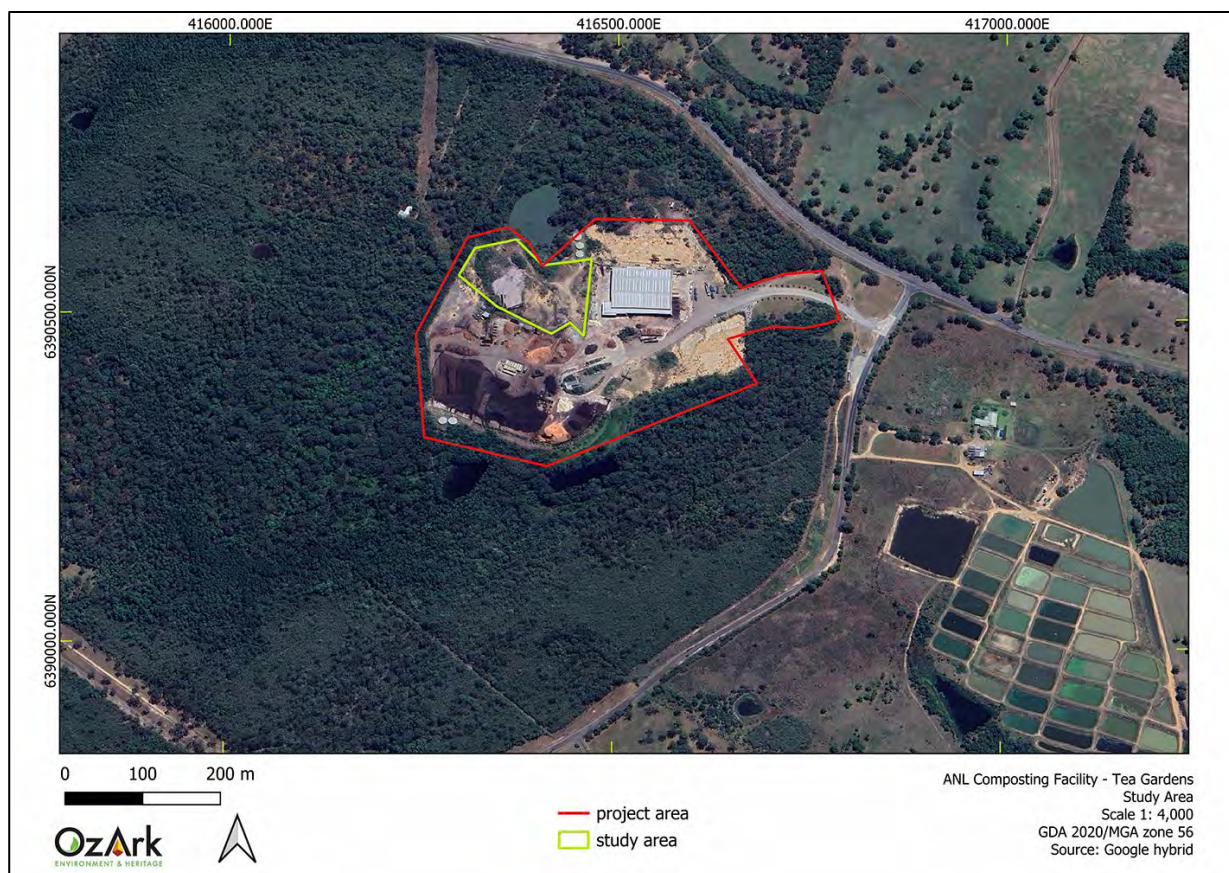
The study area of approximately 1.625 ha is within the larger project area (**Figure 1-3**). There will be no additional ground disturbance to the study area or project area outside of what has been previously approved in DA9/2021. However, there will be a change in the use of the wood waste processing building planned for this area to facilitate the processing of mixed FOGO. All impacts will be within the approved DA area; however, a site inspection was undertaken to satisfy the SEARs requirements and as a precautionary measure by the proponent to ensure Aboriginal objects are not harmed.

## 1.5 ASSESSMENT APPROACH

### Aboriginal cultural heritage

The desktop and visual inspection component for the study area follows the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (due diligence; DECCW 2010). The field inspection followed the *Guide to Investigating, Assessing, and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

**Figure 1-3: Aerial showing the project area and study area.**



## 2 ABORIGINAL DUE DILIGENCE ASSESSMENT

### 2.1 INTRODUCTION

Section 57 of the National Parks and Wildlife Regulation 2019 (NPW Regulation) made under the *National Parks and Wildlife Act 1974* (NPW Act) advocates a due diligence process to determining likely impacts on Aboriginal objects. Carrying out due diligence provides a defence to the offence of harming Aboriginal objects and is an important step in satisfying Aboriginal heritage obligations in NSW.

### 2.2 DEFENCES UNDER THE NPW REGULATION

#### 2.2.1 Low impact activities

The first step before the application of the due diligence process itself is to determine whether the proposed activity is a “low impact activity” for which there is a defence in the NPW Regulation. The exemptions are listed in Section 58 of the NPW Regulation (DECCW 2010: 6).

The proposal is not considered to be a ‘low impact activity’ and therefore the due diligence process must be applied.

#### 2.2.2 Disturbed lands

Relevant to this process are the assessed levels of previous land-use disturbance.

The NPW Regulation Section 58 (DECCW 2010: 18) defines disturbed land as follows:

*Land is disturbed if it has been the subject of 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.*

The study area is largely located where the land’s surface has been modified in a clear and observable manner for the construction of a woodchip processing facility (see **Figure 2-1**). However, some sections of the study area contain landforms that do not meet the criteria of ‘disturbed land’. As such, the due diligence process must be applied.



**Figure 2-1: Aerial of the study area showing portions defined as ‘disturbed land’ and not assessed.**



In summary, it is determined that the proposal must be assessed under the Due Diligence Code of Practice. The reasoning for this determination is set out in **Table 2-1**.

**Table 2-1: Determination of whether Due Diligence Code of Practice applies.**

Item	Reasoning	Answer
Is the activity to be assessed under Division 4.7 (state significant development) or Division 5.2 (state significant infrastructure) of the EP&A Act?	The proposal will be assessed under Part 4 of the EP&A Act.	No
Is the activity exempt from the NPW Act or NPW Regulation?	The proposal is not exempt under this Act or Regulation.	No
Do either or both apply: Is the activity in an Aboriginal place? Have previous investigations that meet the requirements of this Code identified Aboriginal objects?	The activity will not occur in an Aboriginal place. No previous investigations have been undertaken for this proposal.	No
Is the activity a low impact one for which there is a defence in the NPW Regulation?	The proposal is not a low impact activity for which there is a defence in the NPW Regulation.	No
Is the activity occurring entirely within areas that are assessed as ‘disturbed lands’?	The proposal is not entirely within areas of high modification.	No
Due Diligence Code of Practice assessment is required		



## 2.3 APPLICATION OF THE DUE DILIGENCE CODE OF PRACTICE TO THE PROPOSAL

To follow the generic due diligence process, a series of steps in a question/answer flowchart format (DECCW 2010: 10) are applied to the proposed impacts and the study area, and the responses are documented.

### 2.3.1 Step 1

Will the activity disturb the ground surface or any culturally modified trees?

**Yes, the proposal will impact the ground surface under current approvals and may impact culturally modified trees.**

The proposed composting activities will take place within an infrastructure that has existing approval (although not yet built) with some minor additions internally and externally to the approved building to manage ventilation, airflow, and shed temperature. While this will result in no increase in the pre-approved disturbance footprint, the ground will be disturbed and may include the removal of mature, native vegetation, possibly impacting culturally modified trees if present.

### 2.3.2 Step 2a

Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?

**No, there are no previously recorded sites within the study area.**

A search of the Aboriginal Heritage Information Management System (AHIMS) on 16 February 2024 was undertaken over GDA Zone 56, Eastings: 408143–424810, Northings: 6381970–6398852 covering an area of approximately 10 x 10 km centred on the study area. The search returned 72 previously registered Aboriginal sites. None of the previously recorded sites are in the study area (**Figure 2-2**) and the closest recorded site, (38-5-0244, an artefact and potential archaeological deposit), is located approximately 1.5 km northwest of the study area on the Myall Way intersection.

**Figure 2-2** shows all previously recorded sites in relation to the study area and **Figure 2-2** shows the types of sites that are near the study area.

**Table 2-2: Site types and frequencies of AHIMS sites near the study area.**

Site Type	Number	% Frequency
Midden	22	30.5
Shell	12	16.6
Artefact site (quantity unspecified)	10	13.8
Modified tree (carved or scarred)	7	9.7
Potential archaeological deposit (PAD)	6	8.3
Burial	3	4.1

Site Type	Number	% Frequency
Artefact scatter	2	2.7
Stone arrangement	2	2.7
Artefact & PAD	1	1.3
Isolated find	1	1.3
Grinding groove	1	1.3
Grinding groove & PAD	1	1.3
Shell & PAD	1	1.3
Burial & Shell	1	1.3
Aboriginal resource and gathering, artefact & shell	1	1.3
Ceremonial ring (stone & earth) & modified tree	1	1.3
<b>Total</b>	<b>72</b>	<b>100%</b>

**Figure 2-2: Previously recorded sites in relation to the study area.**



The most recorded sites are middens, which are generally located close to the shores of Port Stephens or the Myall Lakes waterways, suggesting extensive use of marine resources in this area. Artefact sites have been identified close to the inland creek systems and modified trees are located in areas of old growth remnant forest along the shores of Port Stephens and close hinterland. Grinding grooves have been recorded in elevated areas containing sandstone, and stone arrangements and a ceremonial ring have been identified on the headlands of North Arm Cove. Other site types in the local area include potential archaeological deposits, burials, an Aboriginal resource and gathering site, and isolated finds.

### 2.3.3 Step 2b

Are there any other sources of information of which a person is already aware?

**No, there are no other sources of information that would indicate the presence of Aboriginal objects in the study area.**

The study area has not been previously assessed and information detailed in **Section 2.3.2** presents the only available information that specifically relates to the study area: an AHIMS search. Two Aboriginal community members accompanied the current visual inspection, however, there are no known cultural values or Aboriginal sites pertaining directly to the location of the proposed work.

Aboriginal people have occupied the Hunter Valley for at least 20,000 years (Koetigg 1987). The study area is located within the lands traditionally inhabited by the Worimi people, whose territory extended from north of the Hunter River to Forster, stretching along the coastline, encompassing Port Stephens and inland close to Gresford, and as far south as Maitland (Tindale 1974). The Worimi were hunter-gatherers and Sokoloffnov (1977) argues that the territories of the Worimi were established to include a variety of habitats rich in raw materials and food resources. Trade, intermarriage, and the sharing of ceremonial places were central to the Worimi nation's interaction with neighbouring tribal groups, such as the Awabakal, Kamilaroi, Gringai, Wanaruah, and other tribes in the region. The Worimi around the immediate Port Stephens area were traditionally divided into four groups or *ngurras*: the Malangal, Gamaipinal, Garuagal and Baraigal (Kelleher Nightingale 2023: 16). The study area is within the traditional lands of the Gumaipinal tribe – who inhabited the district on the north shore of Port Stephens and the Karuah River (W. Enright, *Newcastle Morning Herald* 14<sup>th</sup> November 1900).

Early British accounts indicate that the Worimi lived a mobile lifestyle, primarily in small territorial clans and local clans of extended family groups, forming larger bands through social and cultural links including marriage and communal participation in subsistence activities.

#### 2.3.3.1 *Regional archaeological context*

Previous archaeological work undertaken in the region and ethnohistorical information are used as the basis of a series of predictions about the location and content of archaeological sites in the area. The most relevant and useful of these predictions are as follows (Sullivan 1982):

- Beaches, rivers, and estuaries were important sources of food, particularly fish and shellfish
- The exploitation of estuaries was also commonly associated with exploitation of terrestrial resources
- Short-stay camps commonly occur along beaches and consist of a thin layer of shell (often pipi) and hearthstones

- Longer-stay camps are usually located on the margins of several environmental zones, e.g. near the edges of lagoons or estuaries with access to beaches or floodplains, and apart from shell and hearthstones these larger camps may also contain bone and flaked stone artefacts.

#### Brayshaw 1988

Helen Brayshaw surveyed a large area immediately to the west of Tea Gardens in 1988. She traversed the entire location on foot, focussing on areas of ground surface exposure, mature trees, and environmental features which may have formed a focus for Aboriginal occupation. During the survey, Brayshaw located one site, a shell midden comprising four exposures within a 220 x 40 m strip along the bank of the Myall River opposite the southern part of Dredge Island (approximately 5 km southeast of the study area). All the exposures occurred on sandy elevations vegetated by stands of Swamp Oak, ferns, and grasses. No stone artefacts or charcoal were identified at the site.

#### Dean-Jones, 1900

In the late 1980s, Dean-Jones conducted a comprehensive and large scale assessment to inform the region's future development planning, focusing on the Newcastle Bight (approximately 20 km southwest of the study area). The assessment area encompassed the whole of the Bight and included a review of previously recorded sites and relevant ethnographic data. A survey was undertaken as part of the assessment and recorded over 100 archaeological sites, with a further 40–50 middens noted in the modern foredune/swale but not recorded in detail. Midden sites predominated and stone artefacts were relatively rare. Denser concentrations of stone artefacts were associated with two particular types of sites: midden complexes associated with Late Holocene stable dune surfaces overlooking the deflation basin at the rear of the beach; and open campsites on Pleistocene dunes associated with Pleistocene freshwater wetlands of Holocene estuarine wetlands.

#### ERM 2008

Environmental Resources Management Australia (ERM) were commissioned to prepare an environmental assessment for the proposed Riverside mixed-use development at Tea Gardens in 2008. Their study area of approximately 229 ha was predominantly flat and low-lying, with several beach ridges and creek lines, situated approximately 5 km east of the current study area. Most of their study area was cleared for a pine plantation in 1932 and featured a high percentage of disturbed land. One midden was recorded during the survey, located on a sand dune close to a wetland area. The midden is spread along the south-eastern edge of the sand dune ridge with commanding views of the Myall River.

### Biosis, 2018

In 2018 Biosis was commissioned to undertake an Aboriginal cultural heritage assessment for a proposed hard rock quarry in bushland 4 km northeast of Karuah, approximately 8 km southwest of the current study area. Biosis conducted a survey of the 18 ha study area in the company of three Registered Aboriginal Parties (RAPs) and no previously unrecorded sites were identified. However, the overall effectiveness of the survey was deemed low due to the vegetation cover restricting ground surface visibility at the time.

### Insite Heritage 2021

In 2020 Insite Heritage was commissioned to undertake an Aboriginal cultural heritage assessment for a Deep Creek Quarry, on the Bucketts Way, Limeburners Creek (approximately 20 km from the study area). They conducted a field survey over 2.5 days and no specific cultural heritage values were located within the study area. Eleven (11) square metres test pits were excavated and isolated finds were recorded in four of these. Artefact materials consisted of quartzite, pink silcrete, and fine grained indurated mudstone/tuff. It was determined that the cultural significance of the site is moderate as an area containing evidence of visitation during resource gathering. The scientific significance was considered low, due to the low artefact density not displaying any complexity because of the peripheral occupation.

### Kelleher Nightingale Consulting 2023

In 2021 Kelleher Nightingale Consulting undertook an Aboriginal archaeological and cultural heritage assessment for continuing operations at Boral's Stockton Dry Sand Extraction Project, location at Fullerton Cove. The survey covered areas where previous sand extraction had occurred and no archaeological sites, Aboriginal objects, or areas of Aboriginal archaeological potential were identified.

### Conclusion

The archaeological studies presented above indicate that middens are likely to occur close to the beaches and swampy estuarine regions of Port Stephens. Within the coastal hinterland zones that are distant from permanent water sources, such as the project area, low density artefact sites have been located. It has been proposed (Insite Heritage 2021) that these areas were visited during resource gathering excursions and were not used for long-term occupation.

## **2.3.4 Step 2c**

Are there any landscape features that are likely to indicate presence of Aboriginal objects?

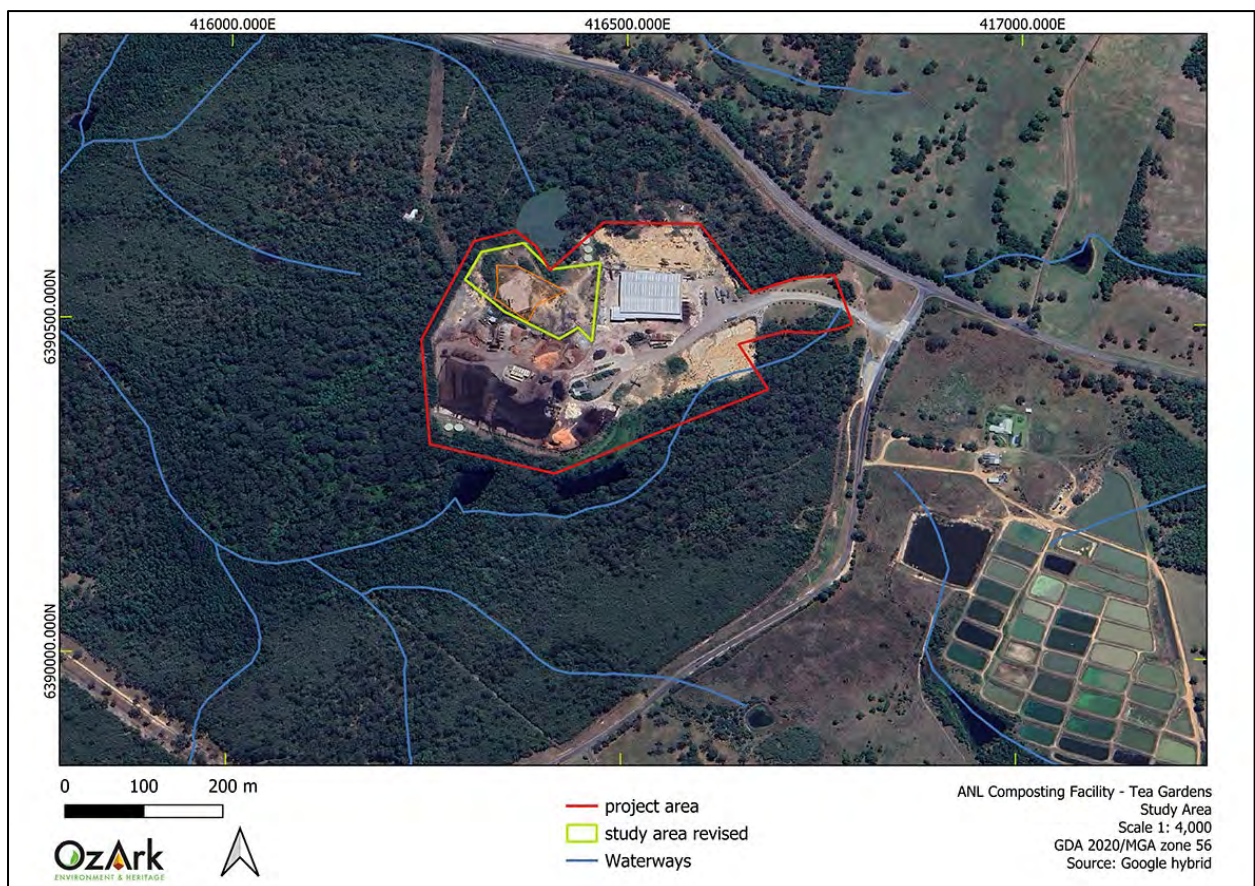
**No, there are no portions of the study area that contain landforms with identified archaeological sensitivity.**



The study area does not include environments that could be considered suitable for long-term occupation by traditional Aboriginal communities.

The closest named waterway to the study area is Station Creek, located approximately 1.7 km to the west. There are three minor non-perennial waterways located to the north (80 m), west (133 m) and south (157 m) (**Figure 2-3**) of the study area, however, these systems are ephemeral and not conducive to long-term occupation. The due diligence guidelines outline a series of landscape features which are known to be archaeologically sensitive and therefore are likely to contain Aboriginal objects. Included in this list is any land within 200 m of 'waters' (DECCW 2010a). As the waterways near the project area are not considered 'waters', the study area does not qualify as an archaeologically sensitive area.

**Figure 2-3: Waterways in proximity to study area.**



The Pindimar Road (pr) and Nungra (ng) soil landscapes occur within the study area. The Pindimar Road Soil landscape is characterised by undulating to rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wooton Beds. The soils are moderately deep (30–70 centimetres [cm]) well-drained, Brown Podzolic Soils. The Nungra Soil Landscape is located on gently inclined Foothills and drainage plains of the Coweabah Hills. They consist of Quaternary alluvium and deep silty footslope deposits eroded from surrounding hills. Soils consist of poorly drained soliths.

Vegetation in the study area has been highly disturbed and is limited to the water catchment run off area below some water tanks, a central portion of the access track, and the steep incline to the northwest of the wood chip chute. The remainder of the study area has been highly disturbed and consists of a covering of weeds and low grasses over gravel.

Previous assessments and investigations completed in the region and surrounding landforms, have confirmed that grinding grooves, modified trees, artefact scatters, artefact sites, and potential archaeological deposits are the most likely site types to be identified in the hinterland regions of Port Stephens. While in its pre-1788 form the landscape of the study area may have contained examples of these site types, the effect of the historic disturbances at the site have greatly lowered the possibility of sites remaining present.

### 2.3.5 Step 3

Can harm to Aboriginal objects or disturbance of archaeologically sensitive landscape features be avoided?

**Yes. No known Aboriginal objects or landforms with identified archaeological sensitivity will be harmed by the proposal.**

The Aboriginal sites identified through the AHIMS search do not occur within the study area and therefore there is no known risk of harming previously identified sites. There are no landforms with archaeological sensitivity within the study area, however, to ensure that Aboriginal objects are not harmed, the proponent elected that the assessment should proceed to a visual inspection.

### 2.3.6 Step 4

Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

**No, the visual inspection confirmed there are no Aboriginal objects within the study area.**

The visual inspection of the study area was undertaken on 23 February 2024 by OzArk Heritage Consultant, Dr Bernadette Drabsch, with Shane Ping and Ray Feeney representing Karuah Local Aboriginal Land Council. The study area was inspected on foot to ground-truth levels of disturbance unable to be distinguished at a desktop level and assess areas with increased archaeological potential. The inspection was recorded by photograph and GPS (**Figure 2-4**).

**Plate 1–4** show representative examples of the environment.

Ground surface visibility was high in areas of disturbance and low within the vegetated areas. Areas of outcropping sandstone were visible immediately north of the woodchip chute; however, inspection found no evidence of grinding grooves or other cultural modification. The vegetation within the study area did not contain old growth native vegetation, and no culturally modified trees were recorded.



In conclusion, no Aboriginal cultural heritage sites were recorded during the visual inspection and due to the high levels of modification to the study area, it is considered that there are no areas with subsurface archaeological potential within the study area.

**Figure 2-4: Survey coverage within the study area.**



## **Discussion**

The predictive model discussed in **Section 2.3.4** indicated that grinding grooves, modified trees, artefact scatters, artefact sites, and potential archaeological deposits were the most likely site types could be present within the study area and these were most likely to be identified in areas featuring lower levels of disturbance. However, no Aboriginal sites were identified within the study area. The lack of grinding grooves may be attributed to the distance of the sandstone outcrops from permanent water and the lack of modified trees attributed to the previous removal of old

growth native vegetation. The general landform modification across the project area, including long-term plantation and landscape supply uses may have removed artefact sites had they been present and would have undoubtedly disturbed potential archaeological deposits that may have once existed.

## 2.4 CONCLUSION

The due diligence process has resulted in the outcome that an Aboriginal Heritage Impact Permit (AHIP) is not required. The reasoning behind this determination is set out in **Table 2-3**.

**Table 2-3: Due Diligence Code of Practice application.**

Step	Reasoning	Answer
Step 1 Will the activity disturb the ground surface or any culturally modified trees?	The proposed works will disturb the ground surface through the construction of the pre-approved wood processing facility and may impact culturally modified trees if present.	Yes
<b>If the answer to Step 1 is 'yes', proceed to Step 2</b>		
Step 2a Are there any relevant records of Aboriginal heritage on AHIMS to indicate the presence of Aboriginal objects?	AHIMS indicated that there are no Aboriginal sites within the study area.	No
Step 2b Are there other sources of information to indicate the presence of Aboriginal objects?	There are no other sources of information to indicate that Aboriginal objects are likely in the study area, although it is noted that there is a general likelihood for landforms in the region to contain Aboriginal objects.	No
Step 2c Will the activity impact landforms with archaeological sensitivity as defined by the Due Diligence Code?	No landforms with identified archaeological sensitivity are present within the study area.	No
<b>If the answer to any stage of Step 2 is 'yes', proceed to Step 3</b>		
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 proposal will not harm known Aboriginal objects or landforms with identified archaeological sensitivity. However, the proponent has elected to proceed to Step 4: a visual inspection.	Yes
<b>If the answer to Step 3 is 'no', a visual inspection is required. Proceed to Step 4.</b>		
Step 4 Does the visual inspection confirm that there are Aboriginal objects or that they are likely?	The visual inspection recorded no Aboriginal objects in the study area. Landforms were found during the inspection to have low archaeological potential and the degree of modification in the study area precludes intact subsurface archaeological deposits.	No
<b>Conclusion</b>		
<b>AHIP is not necessary. Proceed with caution.</b>		

## 3 HISTORIC HERITAGE ASSESSMENT: BACKGROUND

### 3.1 INTRODUCTION

The current assessment will apply the Heritage Council *Historical Archaeology Code of Practice* (Heritage Council 2006) and the International Council on Monuments and Sites' *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Burra Charter 2013) in the completion of a historical heritage assessment, including field investigations.

### 3.2 BRIEF HISTORY OF TEA GARDENS

The earliest mention of the area was when Lieutenant (later Captain) Cook sailed passed Port Stephens in May 1770. In late 1791 a convict transport, the *Salamander*, visited the harbour to conduct a preliminary survey, and in March 1795, the area was further explored, following the Karuah River as far north as where Allworth now stands. Governor Macquarie considered Port Stephens in 1811 with the view of forming a settlement, however, he found the land barren and did not proceed (Regional Histories 1996). From 1816 onwards the area was a centre of cedar-getting activity, and the industry was well established by 1823, with cedar being shipped to England from the port at Sawyers Point (later to become known as Karuah) (Great Lakes Heritage Study 2007). The cedar cutters were not interested in permanent settlement and resided in camps associated with the timber stands they were working.

The timber industry has been a major feature in the landscape of the region, continuing to expand beyond the 1800s well into the 1900s, with the area becoming a major supplier of hardwood, and more recently softwood timber and woodchip.

In 1825, the unsettled land north of the Hunter Valley was selected to establish the Australian Agricultural Company (AA Company), which they took up a one-million-acre land grant around Port Stephens and the land to the north. Port Stephens had already been surveyed and the deep water was considered suitable for the development of a safe port and naval base. In early 1826, construction began on the company's headquarters and their first town at Carrington. Tahlee House (approximately 11 km southwest of the study area) (**Figure 3-1**) was built for the appointed manager, Dawson, and by 1828 Carrington and Tahlee had a population of almost 600 people, including convict labour, who were used to clear the land and build a rudimentary system of roads.



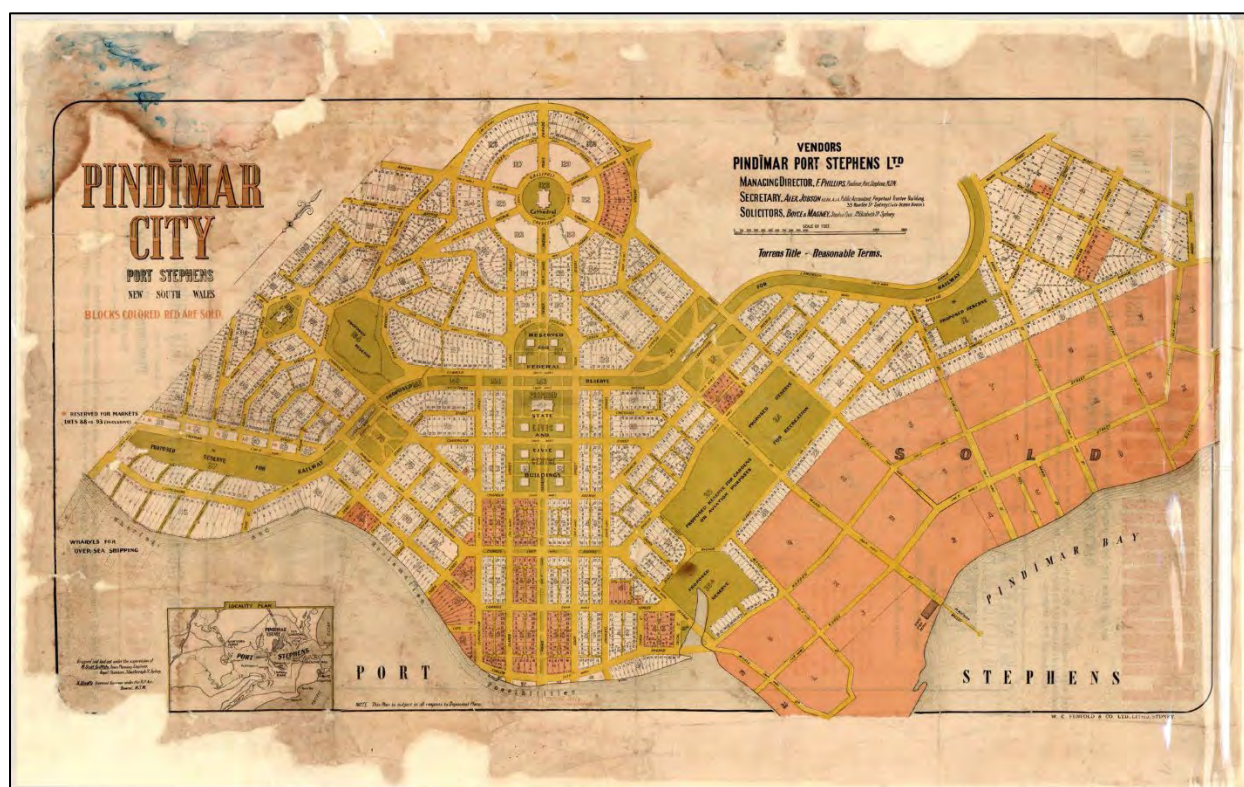
**Figure 3-1: Tahlee house, Carrington. Source: National Trust of Australia.**



Mainly due to hasty and poorly considered observations, the selection of the company's one large land grant proved to be misjudged. The coastal landscape, with poor soil quality and relatively high humidity, was unsuitable for agricultural pursuits and sheep grazing, leading the AA Company to withdraw from the area.

By 1899, the area of North Arm Cove and Pindimar (approximately 5 km south of the study area) was being considered as a potential site for the Nation's capital, with plans to develop Port Stephens as a deep-water international port suitable for overseas shipping. On 6<sup>th</sup> May 1918, the American architect, Walter Burley Griffin, best known for his role in designing Canberra, had a plan for Port Stephens City Site approved by Stroud Shire Council. The plan centred on the region occupied by present day North Arm Cove village. It included wide green spaces along most of the shoreline and there were provisions for jetties and wharves, civil, administration, and service buildings, and two railway stations to join the main northern line (**Figure 3-2**). Advertisements soon began appearing in the Sydney Morning Herald foreshadowing an auction of land at Port Stephens City. The auction did not eventuate as Walter Burley Griffin's company went into liquidation and ownership of the subdivision passed to Henry Halloran who rejigged Griffin's plans (**Figure 3-2**). Port Stephens City was never established; however, some waterfront homes were built before all undeveloped land was zoned 'rural' in the 1960s. (TomareeMuseum.org) The study area sites on the intersection of Pindimar Road, the entrance way to the city that never eventuated.

**Figure 3-2: Pindimar City Map, Port Stephens, New South Wales c. 1919. Source: Hunter Living Histories.**



### 3.3 LOCAL CONTEXT

#### 3.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously recorded heritage within the study area. The results of this search are summarised in **Table 3-1**.

**Table 3-1: Historic heritage: desktop-database search results.**

Name of Database Searched	Date of Search	Type of Search	Comment
National and Commonwealth Heritage Listings	28/2/24	Mid Coast Council LGA	No places listed on either the National or Commonwealth heritage lists are located within or near the study area.
State Heritage Listings	28/2/24	Mid Coast Council LGA	There are no places on the State Heritage Listings located within or near the study area.
Local Environmental Plan (LEP)	28/2/24	Great Lakes LEP 2014	There are no places on the Great Lakes LEP 2014 located within or near the study area.

A search of the Heritage Council of NSW administered heritage databases and the Great Lakes LEP returned no records for historical heritage sites within the designated search areas. As such there will be no impact from the proposal on listed historic heritage items within the broader area.

### 3.4 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004).

The study area was assessed for historic heritage items at the same time as the Aboriginal field survey (see **Section 2.3.6**).

### 3.5 PROJECT CONSTRAINTS

The study area contains infrastructure including a dam, water tanks, access tracks, a woodchip chute, and retaining walls (see **Plate 5–6**). There were areas of dense vegetation within the seepage zone of the water tanks, within the central portion of the access track, and to the immediate north of the woodchip chute. All other areas were accessible during the survey and the items of infrastructure did not unduly affect the survey efficiency or the potential to identify historic heritage items.

### 3.6 SURVEY RESULTS

The study area contained evidence of significant land modifications, a dam, retaining wall, water tanks, and a woodchip chute, which was most likely constructed in 1979 by Bunderbar Forest Products Limited (BFP) (Tomasy 2020: 6) (see **Plate 5–6**).

No historic heritage items were recorded during the survey of the study area. As such, there will be no impact on significant historic heritage from the proposal. The absence of historic heritage items within the study area is not surprising given the use of the study area as a woodchip plant and the high degree of land modification that has occurred in relation to this industry.

## 4 MANAGEMENT RECOMMENDATIONS

### 4.1 ABORIGINAL CULTURAL HERITAGE

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal. This moves the proposal to the following outcome:

*AHIP application is not necessary. Proceed with caution. If any Aboriginal objects are found, stop work, and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW.*

To ensure the greatest possible protection of the area's Aboriginal cultural heritage values, the proposed work may proceed without further archaeological investigation under the following conditions:

- 1) All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects that may be in adjacent landforms. Should the parameters of the proposal extend beyond the assessed area, then further archaeological assessment may be required.
- 2) This Assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
- 3) Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (see **Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the NPW Act and the contents of the *Unanticipated Finds Protocol*.
- 4) The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

### 4.2 HISTORIC HERITAGE

Recommendations concerning the historic values within the study area are as follows.

- 5) It is assessed that it will be very unlikely that significant historic items will be discovered within the study area. However, if potentially significant items are discovered, the *Historic Heritage Unanticipated Finds Protocol* (**Appendix 4**) should be followed.



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Tomaree Museum	Tomaree Museum, <a href="https://tomareemuseum.org.au">https://tomareemuseum.org.au</a>

## PLATES



Plate 1: View north along the central access track and vegetation in seepage area.



Plate 2: View north, from southern point of the study area, along the eastern boundary towards the water tanks. Note the vegetation of dense compact weeds and grasses along the boundary.





Plate 3: Highly modified landform at the centre of the study area.



Plate 4: Outcropping sandstone in the north-western portion of the study area.






Plate 5: View towards the woodchip chute and the western boundary of the study area.



Plate 6: Woodchip chute and timber retaining wall.



## APPENDIX 1: AHIMS SEARCH RESULTS



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 4276

Client Service ID : 864950


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-5-0044	Tea Gardens.	AGD	56	421236	6385002	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Unknown Author							
38-5-0048	North Head;	AGD	56	424030	6382221	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Unknown Author							
38-5-0049	North Head; Yacaaba	AGD	56	424030	6382221	Open site	Valid	Burial : -	Burial/s	
	Contact	Recorders	Leslie Maynard, Leslie Maynard							
38-5-0054	Northarm Cove; Fame Cove;	GDA	56	411964	6383598	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Mr. Ted Hutchinson							
38-5-0055	Northarm Cove Fame Cove	GDA	56	412020	6383568	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Helen Clemens							
38-5-0062	Northarm Cove Baromee Hill	AGD	56	409820	6384421	Open site	Valid	Stone Arrangement : -	Stone Arrangement	99706, 99707
	Contact	Recorders	Michael Pearson							
38-5-0076	Monkey Jacket; Tea Garden;	AGD	56	420660	6386560	Open site	Valid	Shell : -, Artefact : -	Midden	249
	Contact	Recorders	Ms. Mary Dallas							
38-5-0082	Hawks Nest	AGD	56	422560	6384060	Open site	Valid	Shell : -, Artefact : -	Midden	1034
	Contact	Recorders	Denis Byrne							
38-5-0083	Carrington 1; Carrington;	AGD	56	408200	6384920	Open site	Valid	Shell : -, Artefact : -	Midden	849
	Contact	Recorders	Helen Brayshaw							
38-5-0084	Carrington 2; Carrington;	AGD	56	408650	6383360	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	849
	Contact	Recorders	Helen Brayshaw							
38-5-0085	Carrington 3; Carrington;	AGD	56	408640	6385270	Open site	Valid	Stone Arrangement : -	Stone Arrangement	849
	Contact	Recorders	Helen Brayshaw							
38-5-0087	Tea Gardens;	AGD	56	421600	6387050	Open site	Valid	Shell : -, Artefact : -	Midden	102474
	Contact	Recorders	Helen Brayshaw, Mr. David Crew							
38-5-0147	Myall Quays 1; MQ-1;	AGD	56	420550	6386500	Open site	Valid	Shell : -, Artefact : -	Midden	102474
	Contact	Recorders	Doctor Jillian Comber, Glen Morris							
38-5-0148	Myall River Midden-1; MRM-1	AGD	56	421600	6387100	Open site	Valid	Shell : -, Artefact : -	Midden	1373, 102474
	Contact	Recorders	Helen Brayshaw							
38-5-0003	Northarm Cove Baromee Point	AGD	56	409356	6384778	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Moore							
38-5-0004	Northarm Cove Baromee Point	AGD	56	409551	6384142	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Moore							

Report generated by AHIMS Web Service on 16/02/2024 for Jordan Henshaw for the following area at Datum : GDA, Zone : 56, Eastings : 408143.0 - 424810.0, Northings : 6381970.0 - 6398852.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 72

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 1

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 4276

Client Service ID : 864950

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-5-0008	Northarm Cove Bulga Creek	AGD	56	411000	6387000	Open site	Valid	Ceremonial Ring (Stone or Earth) : -, Modified Tree (Carved or Scarred) : -	Bora/Ceremonial, Carved Tree	
	Contact	Recorders	David Bell							
38-5-0010	Northarm Cove Fame Cove A	GDA	56	412130	6383497	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Unknown Author							
38-5-0011	Fame Bay; Soldiers Point;	AGD	56	412144	6382362	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Bill Lord							
38-5-0018	Hawks Nest	AGD	56	421901	6383643	Open site	Valid	Shell : -, Artefact : -	Midden	102218
	Contact	Recorders	Len Dyall							
38-5-0019	Hawks Nest;	AGD	56	423703	6385049	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Len Dyall							
38-5-0020	Providence Bay;	AGD	56	423279	6383304	Open site	Valid	Shell : -, Artefact : -	Midden	102218
	Contact	Recorders	Len Dyall							
38-5-0025	Providence Bay;	AGD	56	424311	6381861	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	Len Dyall							
38-5-0192	Winda Woppa 1 Burial Site	AGD	56	421681	6383884	Open site	Valid	Burial : 1		
	Contact	Recorders	Ms. Jill Rugg							
38-5-0199	BUNDABAH CREEK (SW)	AGD	56	414020	6391330	Open site	Valid	Artefact : -	1340, 2015	4645
	Contact	Recorders	Adam Ford							
38-5-0200	HAGANS LANE	AGD	56	414330	6391330	Open site	Valid	Artefact : -		4645
	Contact	Recorders	Adam Ford							
38-5-0201	BUNDABAH CREEK (NW)	AGD	56	414200	6391330	Open site	Valid	Artefact : -		4645
	Contact	Recorders	Adam Ford							
38-5-0202	MT KARUAH/CARRINGTON 1	AGD	56	408750	6387050	Open site	Valid	Artefact : -		
	Contact	Recorders	Brad Welsh							
38-5-0203	NT KARUAH/CARRINGTON 2	AGD	56	408650	6387100	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Brad Welsh, Carol Ridgeway Bisset							
38-5-0204	MT KARUAH/CARRINGTON 3	AGD	56	408730	6387050	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Brad Welsh							
38-5-0078	Myall River Pine Plantation	AGD	56	424324	6390911	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	Recorders	L. Villiers							


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<div>  <div> <b>AHIMS Web Services (AWS)</b>  <b>Extensive search - Site list report</b> </div> <div> Your Ref/PO Number : 4276  Client Service ID : 864950 </div> </div>										
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-5-0224	Pindimar 1	AGD	56	414000	6383250	Open site	Valid	Shell : 1		98302
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0236	Bundabah Creek	AGD	56	414890	6392613	Open site	Valid	Artefact : -		98226
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0244	Myall Way Intersection	AGD	56	415420	6391820	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		98883
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0264	Yacaabah Head Site 3	AGD	56	423465	6383208	Open site	Valid	Shell : -		1877
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0265	Yacaabah Head Site 4	AGD	56	423483	6382826	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0266	Yacaabah Head	AGD	56	423999	6382183	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0260	Yacaaba - Burial site	GDA	56	423805	6382765	Open site	Valid	Burial : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0259	Yaacaba	AGD	56	423737	6382562	Open site	Valid	Burial : 1, Shell : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0262	Yacaabah Headland Site 1	AGD	56	424187	6382066	Open site	Valid	Aboriginal Resource and Gathering : -, Artefact : -, Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0263	Yacaabah Head Site 2	AGD	56	423435	6383247	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0041	Tea Gardens Limekilns	AGD	56	419134	6384962	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0274	Farm Cove Artefacts	GDA	56	412022	6383561	Open site	Valid	Artefact : 2		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0275	Piggy Beach Axe Grooves	GDA	56	413203	6382817	Open site	Valid	Grinding Groove : 3, Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0056	Tea Gardens	AGD	56	421000	6385000	Open site	Valid	Shell : -, Artefact : -	Midden	719
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0301	Shearwater PAD 1	GDA	56	422000	6389000	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		101531,10212, 6,102127
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
Report generated by AHIMS Web Service on 16/02/2024 for Jordan Henshaw for the following area at Datum :GDA, Zone : 56, Eastings : 408143.0 - 424810.0, Northings : 6381970.0 - 6398852.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 72 This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.										

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-5-0302	Shearwater PAD 2	GDA	56	420500	6389100	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		101531,10212, 6,102127
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0306	Riverside 01	AGD	56	421423	6387509	Open site	Valid	Shell : -		102474
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0315	Riverside PAD	GDA	56	421291	6387326	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		102474
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0329	Kore Kore Creek	GDA	56	418592	6387375	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0332	Bundabah 1	AGD	56	410996	6384139	Open site	Valid	Shell : 1		103661
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0333	Bundabah 2	AGD	56	411161	6384211	Open site	Valid	Artefact : 1		103661
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0334	Bundabah 3	AGD	56	411206	6384294	Open site	Valid	Artefact : 1, Shell : 1		103661
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0335	Bundabah 4	AGD	56	411375	6384300	Open site	Valid	Artefact : 1		103661
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0348	ADV-SHW-2	GDA	56	421924	6389449	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0349	ADV-SHW-1	GDA	56	421936	6389524	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0340	WS/Pindimar/1/PAD	GDA	56	416840	6384175	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0341	WS/Pindimar/1	GDA	56	416815	6384378	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0342	Shell midden 1	GDA	56	411541	6383508	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0343	Shell midden 2	GDA	56	412178	6383907	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
38-5-0344	Shell midden 3	GDA	56	411214	6383620	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
Report generated by AHIMS Web Service on 16/02/2024 for Jordan Henshaw for the following area at Datum :GDA, Zone : 56, Eastings : 408143.0 - 424810.0, Northings : 6381970.0 - 6398852.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 72 This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.										

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**AHIMS Web Services (AWS)**

Extensive search - Site list report

Your Ref/PO Number : 4276

Client Service ID : 864950

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
38-5-0345	Shell midden 5 & PAD	GDA	56	413208	6382966	Open site	Valid	Potential Archaeological Deposit (PAD) :- Shell :-		
	Contact	Recorders	MCH - McCardle Cultural Heritage Pty Ltd,Ms.Penny McCardle					Permits		
34-5-0012	Shell midden 4	GDA	56	412442	6383877	Open site	Valid	Shell :-		
	Contact	Recorders	MCH - McCardle Cultural Heritage Pty Ltd,Ms.Penny McCardle					Permits		
38-5-0346	Fame Cove Isolated artefact 1	GDA	56	413348	6383087	Open site	Valid	Artefact :-		
	Contact	Recorders	MCH - McCardle Cultural Heritage Pty Ltd,Ms.Penny McCardle					Permits		
38-5-0356	Shear-Groove-1	GDA	56	420741	6389059	Open site	Not a Site	Grinding Groove :-		
	Contact	Recorders	Advitech Pty Limited,Doctor.Rod Bennison					Permits		
38-5-0357	Shear-Stone Artefacts-2	GDA	56	420667	6389157	Open site	Not a Site	Artefact :-		
	Contact	Recorders	Advitech Pty Limited,Doctor.Rod Bennison					Permits		
38-5-0359	Riverside 02	GDA	56	420605	6387199	Open site	Destroyed	Shell : 1		102474
	Contact	Recorders	Kleinfelder Australia Pty Ltd - Cardiff,Mrs.Katherine Deverson,Mr.Jake Brown					Permits	4954	
38-5-0389	Scarred tree Yacaaba Headland -tree 2	GDA	56	424377	6382195	Open site	Valid	Modified Tree (Carved or Scarred) :-		
	Contact	Recorders	Mr.Warren Mayers,DPIE - Armidale					Permits		
38-5-0390	Scar tree Yacaaba Headland - tree 3	GDA	56	424384	6382198	Open site	Valid	Modified Tree (Carved or Scarred) :-		
	Contact	Recorders	Mr.Warren Mayers,DPIE - Armidale					Permits		
38-5-0391	Yacaaba scar tree - monitoring plot 3	GDA	56	424397	6382130	Open site	Valid	Modified Tree (Carved or Scarred) :-		
	Contact	Recorders	Mr.Warren Mayers,DPIE - Armidale					Permits		
38-5-0392	Yacaaba scar tree 1 - 50yo	GDA	56	422336	6384991	Open site	Valid	Modified Tree (Carved or Scarred) :-		
	Contact	Recorders	Mr.Warren Mayers,DPIE - Armidale					Permits		
38-5-0410	Hawks Nest STP PAD	GDA	56	423556	6386239	Open site	Valid	Potential Archaeological Deposit (PAD) :-		105307
	Contact	Recorders	Mr.Martin Wright					Permits	5046	

Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

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## APPENDIX 2: ABORIGINAL HERITAGE: UNANTICIPATED FINDS PROTOCOL

---

An Aboriginal artefact is anything that is the result of the past Aboriginal activity. This includes stone (artefacts, rock engravings, etc.), plant (culturally scarred trees), and animal (if showing signs of modification, i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Cultural heritage significance is assessed by the Aboriginal community and is typically based on traditional and contemporary lore, spiritual values, and oral history, and may also consider scientific and educational value.

Protocol to be followed if previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. If any Aboriginal object is discovered and/or harmed in, or under the land while undertaking the proposed development activities, the proponent must:
  - a. Not further harm the object
  - b. Immediately cease all work at the particular location
  - c. Secure the area to avoid further harm to the Aboriginal object
  - d. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au), providing any details of the Aboriginal object and its location; and
  - e. Not recommence any work at the particular location unless authorised in writing by Heritage NSW.
2. If Aboriginal burials are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.
3. Cooperate with the appropriate authorities and relevant Aboriginal community representatives to facilitate:
  - a. The recording and assessment of the find(s)
  - b. The fulfilment of any legal constraints arising from the find(s), including complying with Heritage NSW directions
  - c. The development and implementation of appropriate management strategies, including consultation with stakeholders and the assessment of the significance of the findings).
4. Where the find(s) are determined to be an Aboriginal object(s), recommencement of work in the area of the find(s) can only occur in accordance with any consequential legal requirements and after gaining written approval from Heritage NSW (normally an Aboriginal Heritage Impact Permit).



### APPENDIX 3: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION

	
A retouched silcrete flake	A quartz flake
	
Microliths (scale = 1 cm)	Volcanic flakes
	
Flake characteristics (scale = 1 cm)	A mudstone/tuff core from which flakes have been removed

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## APPENDIX 4: HISTORIC HERITAGE: UNANTICIPATED FINDS PROTOCOL

---

A historic artefact is anything that is the result of past activity not related to the Aboriginal occupation of the area. This includes pottery, wood, glass, and metal objects as well as the built remains of structures, sometimes heavily ruined.

Heritage significance of historic items is assessed by suitably qualified specialists who place the item or site in context and determine its role in aiding the community's understanding of the local area, or their wider role in being an exemplar of state or even national historic themes.

The following protocol should be followed if previously unrecorded or unanticipated historic objects are encountered:

1. All ground surface disturbance in the area of the finds should cease immediately, then:
  - a) The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted
  - b) The site supervisor will be informed of the find(s).
2. If finds are suspected to be human skeletal remains, then NSW Police must be contacted as a matter of priority.
3. If there is substantial doubt regarding the historical significance for the finds, then gain a qualified opinion from an archaeologist as soon as possible. This can circumvent proceeding further along the protocol for items that turn out not to be significant. If a quick opinion cannot be gained, or the identification is that the item is likely to be significant, then proceed to the next step.
4. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au), providing any details of the historic find and its location.
5. If in the view of the heritage specialist or Heritage NSW the findings appear not to be significant, work may recommence without further investigation. Keep a copy of all correspondence for future reference.
6. If in the view of the heritage specialist or Heritage NSW the finds appear to be significant, facilitate the recording and assessment of the finds by a suitably qualified heritage specialist. Such a study should include the development of appropriate management strategies.
7. If the find(s) are determined to be significant historic items (i.e. of local or state significance), any re-commencement of ground surface disturbance may only resume following compliance with any legal requirements and gaining written approval from Heritage NSW.





## APPENDIX L – BIODIVERSITY ASSESSMENT



# ECOLOGICAL ASSESSMENT

for a  
Proposed Extension to the Existing Australian Native Landscapes  
Facility  
at

**Lot 1 DP714149  
Pindimar Road  
TEA GARDENS  
NSW**

**Prepared by:**

**WILDTHING** Environmental Consultants  
38c Stapleton Street  
WALLSEND NSW 2287  
ABN: 41 033 509 215

**For:**

Australian Native Landscapes  
C/o Tattersall Lander Pty. Ltd.  
PO Box 580  
RAYMOND TERRACE NSW 2324

***Job No: 12376***




***June 2020***

# WILDTHING

## Environmental Consultants

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Email: [admin@wildthing.com.au](mailto:admin@wildthing.com.au) [www.wildthing.com.au](http://www.wildthing.com.au)  
A division of Tattersall Lander Pty Ltd  
ABN: 41 003 509 215

Project Name	Ecological Assessment for proposed additions to the existing Australian Native Landscapes facility at Lot 1 DP 714149 Pindimar Road, Tea Gardens NSW.	
Project Number	12376	
Prepared by	Daryl Harman BEnvSc Senior Ecologist	
	Dr Kylie Bridges BEnvSc Hons PhD Ecologist	
	Mungo Worth Ecologist	
Status	15/06/2020	
Version Number	Final	

### Disclaimer

This report has been prepared in accordance with the proposal provided by the Client and outlined within this report. All findings, conclusions or recommendations contained within this report are based upon the data and results collected under the times and conditions specified in the report and are only applicable for the proposal considered within this report. This report has been prepared for use exclusively by the Client. No responsibility for its use by any other party is accepted by Wildthing Environmental Consultants.



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APPENDIX B – FLORA LIST

APPENDIX C - FAUNA LIST

APPENDIX D – KOALA ASSESSMENT REPORT

## **1.0 INTRODUCTION**

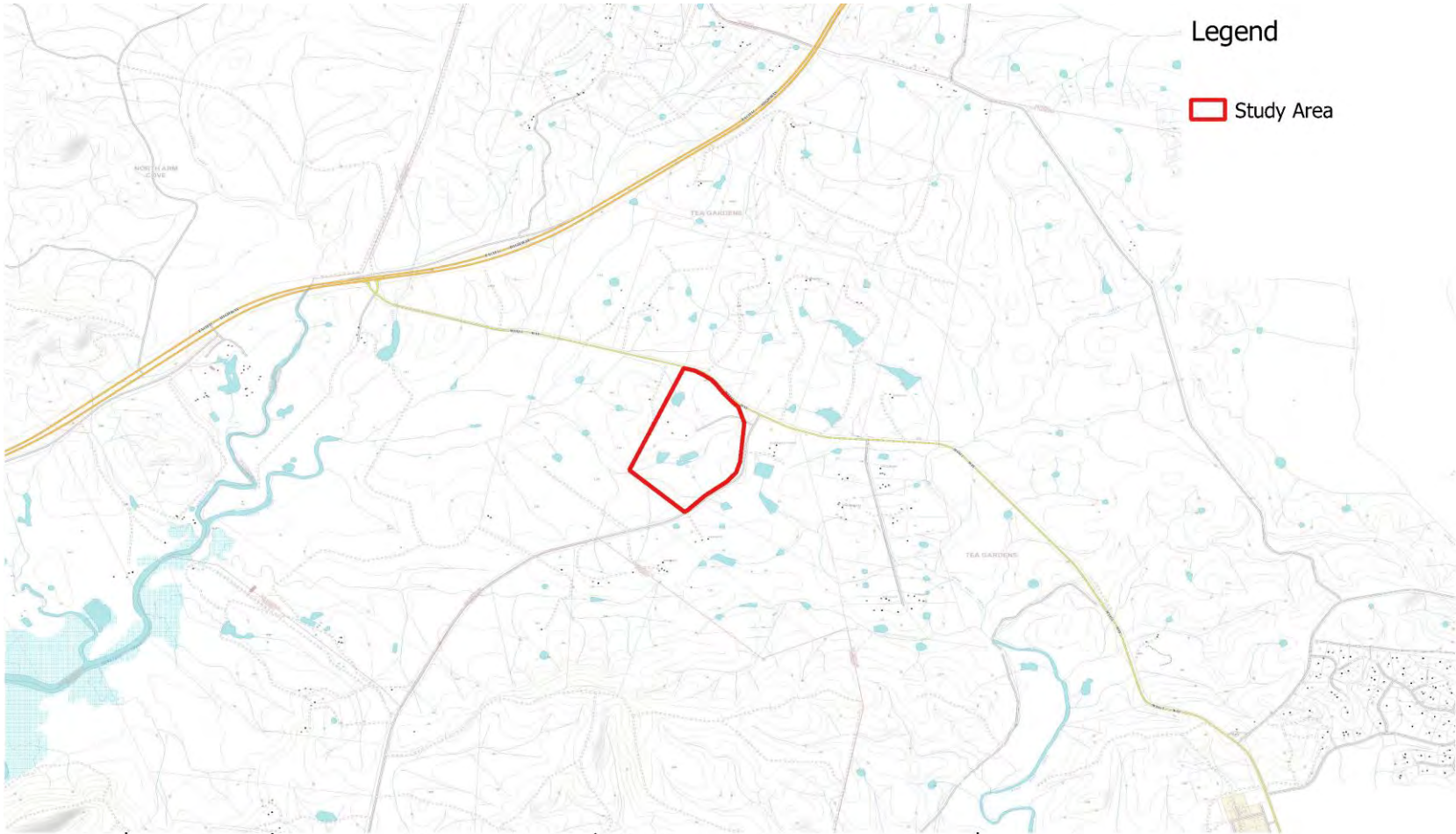
Flora, fauna and habitat studies have been undertaken for a proposed extension to the existing Australian Native Landscapes facility at Lot 1 DP 714149 Pindimar Road, Tea Gardens NSW. The investigations were in accordance with the requirements of the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The results are presented here in the form of an Ecological Assessment.

### **1.1 LOCATION OF THE STUDY AREA**

The site is located on the south-western side of the intersection of Pindimar Road and Myall Way approximately 5km north-west of the Tea Gardens CBD (Figure 1.1 & 1.2). The study area (Lot 1 DP 714149) was approximately 42ha.

### **1.2 THE DEVELOPMENT**

The proposed development is for extensions to the existing Australian Native Landscapes facility, including packing sheds, workshop extension, wood waste processing building, silt trap, storage tanks, dam extension and associated works. The proposal involves an extension to the north side of the existing workshop and a wood waste processing extension. No further vegetation clearing is required for these actions. A silt trap is proposed to be installed to the north of the site, collecting runoff from the proposed wood chip mill extension. This action will require vegetation clearing. The development will also involve the construction of two packing sheds on the existing hardstand area to the south east of the development. Further clearing of vegetation is required for this action. An extension to the dam located within the northwest of the site is proposed and will require further vegetation clearing and two storage tanks used for firefighting is proposed to be installed to the north of the site with no vegetation clearing required. Lastly, additional works involving a wetland area further filtering discharge from the proposed silt trap before it enters the dam to the north is proposed and will require further vegetation clearing. Plans for the proposed development have been provided in Figures 1.3 and 1.4.



Job Ref	12376
A4 Scale	1:20000

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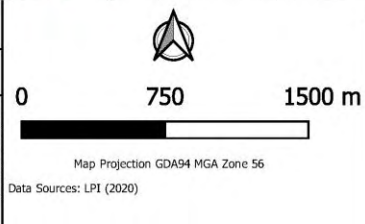
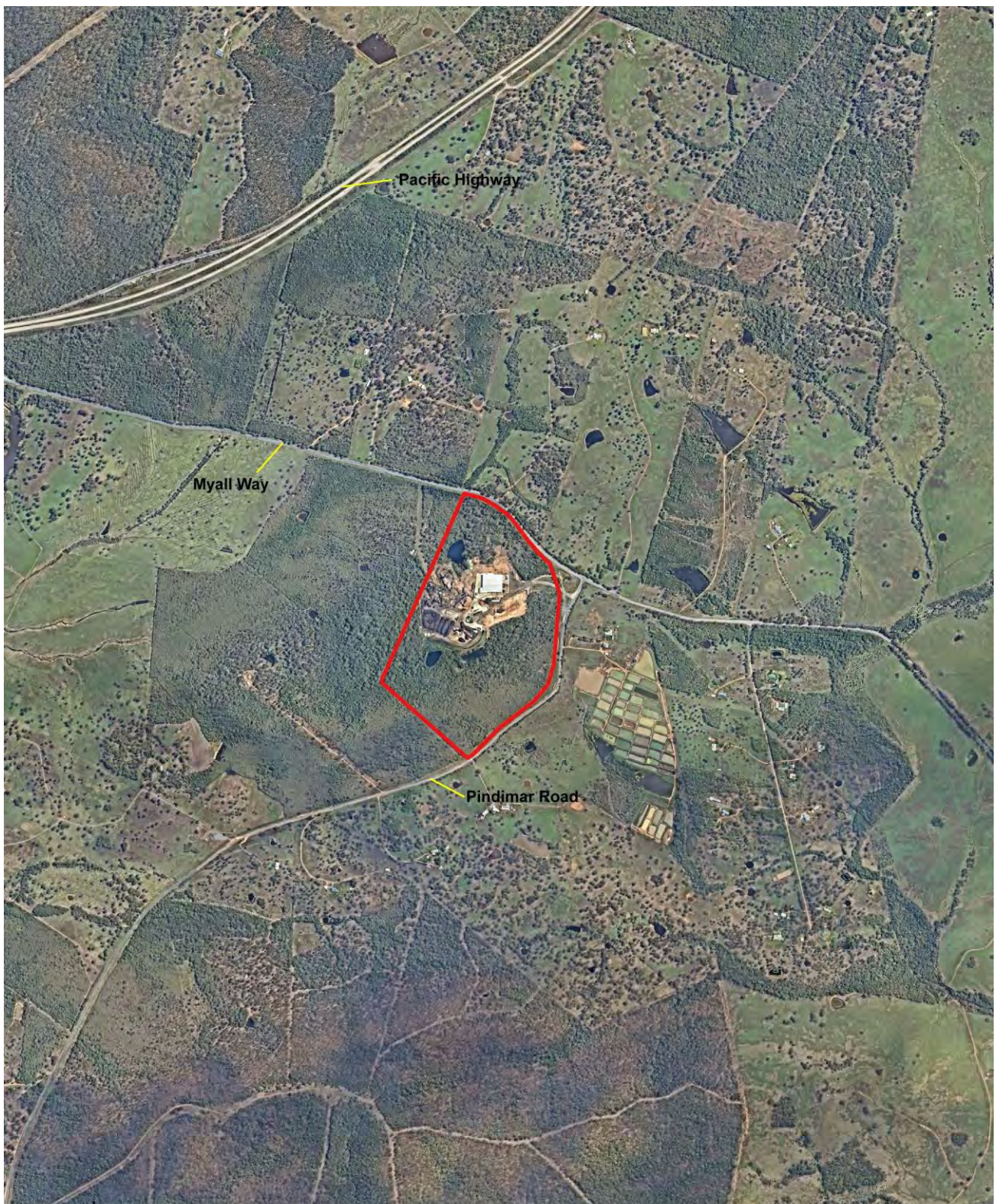


Figure 1.1  
**Location of Study Area**  
12 Pindimar Road  
TEA GARDENS, NSW  
June 2020

WILDTHING  
Environmental Consultants  
(a Division of Tattersall Lander Pty Ltd)  
ABN 41 003 509 215





Author	DH
A4 Scale	1:18000
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Figure 1.2

**Study Area - Lot 1  
 DP 714149**

12 Pindimar Road  
 TEA GARDENS, NSW

Aerial Photo  
 Nearmap 11 February 2020

Legend  
 Study Area

**WILDTHING**  
 Environmental Consultants  
 (a Division of Tattersall Lander Pty Ltd)  
 ABN 41 003 509 215









Job Ref	12376
A4 Scale	1:2000

0 75 m

Map Projection GDA94 MGA Zone 56

Data Sources: LPI (2019),

Figure 1.4.

**Proposal showing areas of impact**

12 Pindimar Road  
TEA GARDENS, NSW

June 2020

**WILDTHING**  
Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215

## **2.0 SITE CONTEXT**

The site is located within the NSW North Coast Bioregion and Karuah Manning Sub-bioregion (regions gazetted by the Minister, or an Interim Biogeographical Regionalisation of Australia (IBRA Bioregion). The site is also located within the Newcastle Coastal Ramp NSW Landscape and occurs in the Mid Coast Local Government Area (LGA).

## **2.1 HYDROGEOGRAPHY**

Three first order prescribed streams and four dams are present within the site (Figure 2.1). A first order stream is located within with in the northwest of the study, which flows out of Dam 3 which is proposed to be extended. Another first order stream runs to the south-west through the study area feeding Dams 1 and 2. A third first order stream is located within the southeast corner of the site away from the proposal.

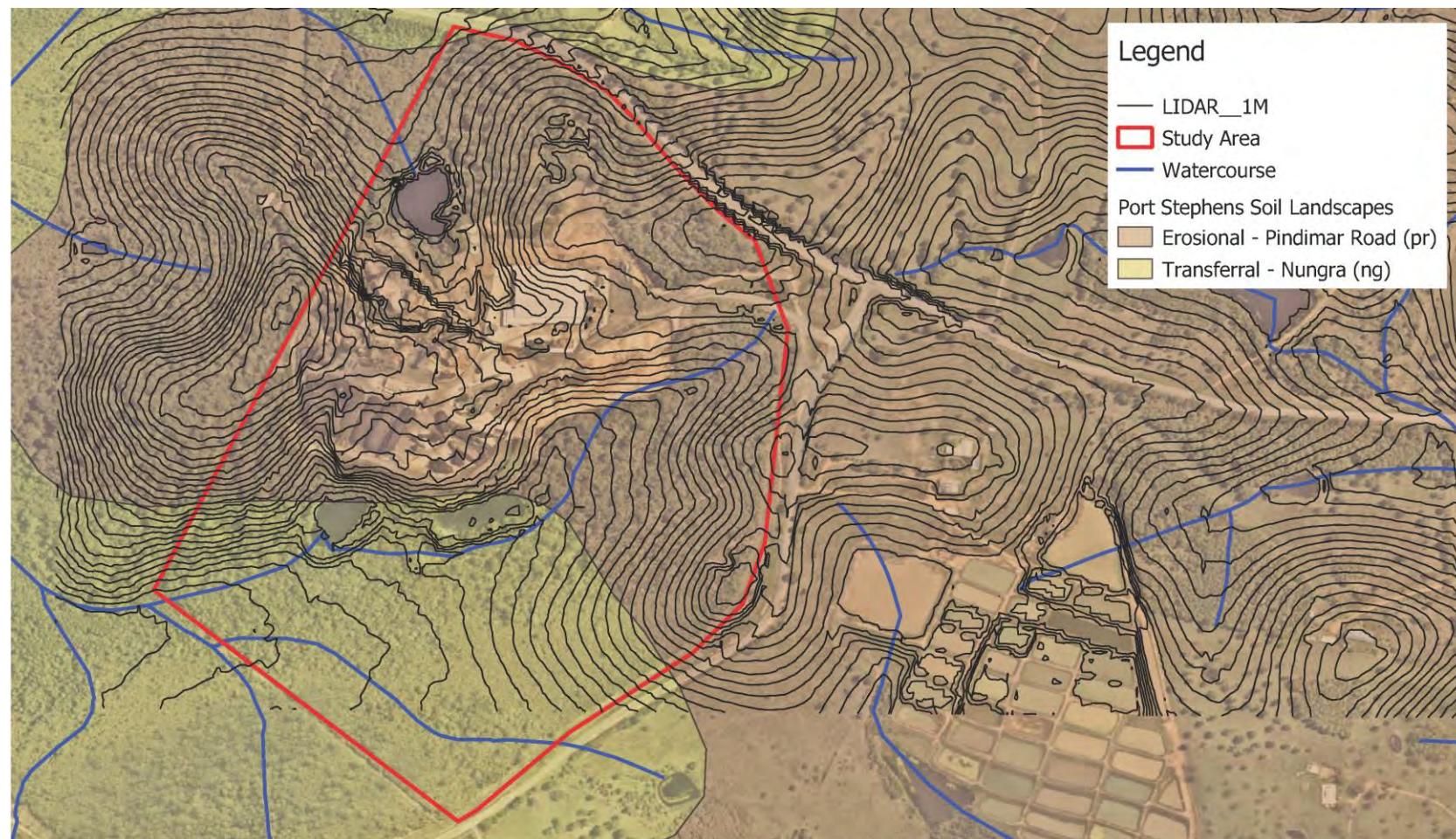
## **2.2 TOPOGRAPHY, GEOLOGY AND SOILS**

According to the Soil Landscapes of the Port Stephens 1:100 000 Sheet (Murphy, 1993) two soil landscapes the Pindimar Road (pr) and the Nungra (ng) were present within the study area. The erosional landscape Pindimar Road covered the norther two-thirds of the study area including the entire area of impact. The Pindimar Road Soil Landscape is characterised by undulating to rolling hills on Carboniferous fossiliferous mudstones and lesser interbeds of lithic sandstones of the Wootton Beds. The soils are moderately deep (30-70cm) well drained Brown Podzolic Soils. The Transferral Nungra Soil Landscape is located on gently inclined Footslopes and drainage plains of the Coweabah Hills. They consist of Quaternary alluvium and deep silty footslope deposits eroded from surrounding hills and underlying Carboniferous rock strata. Soils consists of poorly drained soliths.

## **2.3 VEGETATION**

With the exception of the existing footprint of the ANL operations the surrounding area was undeveloped and covered in native vegetation consisting primarily of open forest. The invasive *Pinus elliotii* (Slash Pine) was common within parts of the study area.





Job Ref	12376
A4 Scale	1:4000

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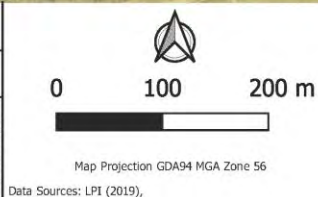


Figure 2.1

**Topography, Soils and  
Hydrogeography**

12 Pindimar Road  
TEA GARDENS, NSW

June 2020

**WILDTHING**  
Environmental Consultants  
(a Division of Tattersall Lander Pty Ltd)  
ABN 41 003 509 215

### **3.0 LEGISLATIVE CONTEXT**

The following sections detail the legislative frameworks relevant to this report.

#### **3.1 NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017**

The assessment of development applications in NSW is regulated under Part 4 or Part 5 of the EP&A Act. Part 1 Section 1.7 of the EP&A Act links proponents to Part 7 of the BC Act for the operation of the EP&A Act in connection with potential impacts to the terrestrial environment. The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs).

#### **3.2 NSW BIODIVERSITY CONSERVATION ACT 2016**

The purpose of the BC Act is “to establish a pathway to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity and to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values”.

In accordance with the BC Act, the Biodiversity Assessment Method (BAM) and entry into the Biodiversity Offsets Scheme (BOS) is applicable to certain development activities based on specific Preparation of a Biodiversity Development Assessment Report (BDAR) is required for a development application that meets any of the following criteria detailed in Table 3.1.

As the proposed development was not found to comply within any of the criteria it was determined that a BDAR and entry into the BOS threshold would not be applicable for this development. Thus, the survey methodology detailed in the following sections have been undertaken in accordance with the requirements for a standard Assessment of Significance.

The BC Act also imposes various obligations on determining authorities in relation to impacts on biodiversity values that are serious and irreversible. For applications for development consent under Part 4 of the EP&A Act these obligations generally require a decision-maker to refuse to grant development consent. In order to provide clarity regarding what could be considered a serious and irreversible impact a guidance document has been released (NSW Gov 2017) which identifies the species and ecological communities (SAIL entities) that are likely to be the subject of serious and irreversible impacts. No candidate SAIL entities were found to be present within the site thus no obligation for development refusal would be applicable to this proposed development from relevant regulatory bodies.



**Table 3.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposed development.**

CRITERIA FOR ENTRY INTO THE BIODIVERSITY OFFSETS SCHEME (BOS)	SECTION CRITERIA ADDRESSED	ASSESSMENT OF CRITERIA
Part 4 development activities deemed to be 'State Significant' under the NSW Environmental Planning and Assessment Act 1979 (NSW EP&A Act)		The proposal is not recognised as State Significant
Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.	Section 7.0	No declared areas of outstanding biodiversity value were located within or in proximity to the site.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;	Section 7.0	The five-part test found no significant impact on threatened species, populations or ecological communities listed under Schedules 1 and 2 of the BC Act.
Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map);	Section 3.0 Figure 3.1.	The NSW Biodiversity Values Map was consulted on the 10 June 2020. As of this date it was determined that there were no mapped 'Biodiversity Values' within the proposed development footprint or lot (Study Area). Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act. An extract of the Biodiversity Values Map has been provided in Figure 3.1.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.	Section 6.0	The minimum allowable area of native vegetation clearance for the proposed development, as determined by the prescribed minimum lot size, is 1.00 ha. Area calculations have determined that the direct clearance of native vegetation for the proposed development will not exceed 1ha.



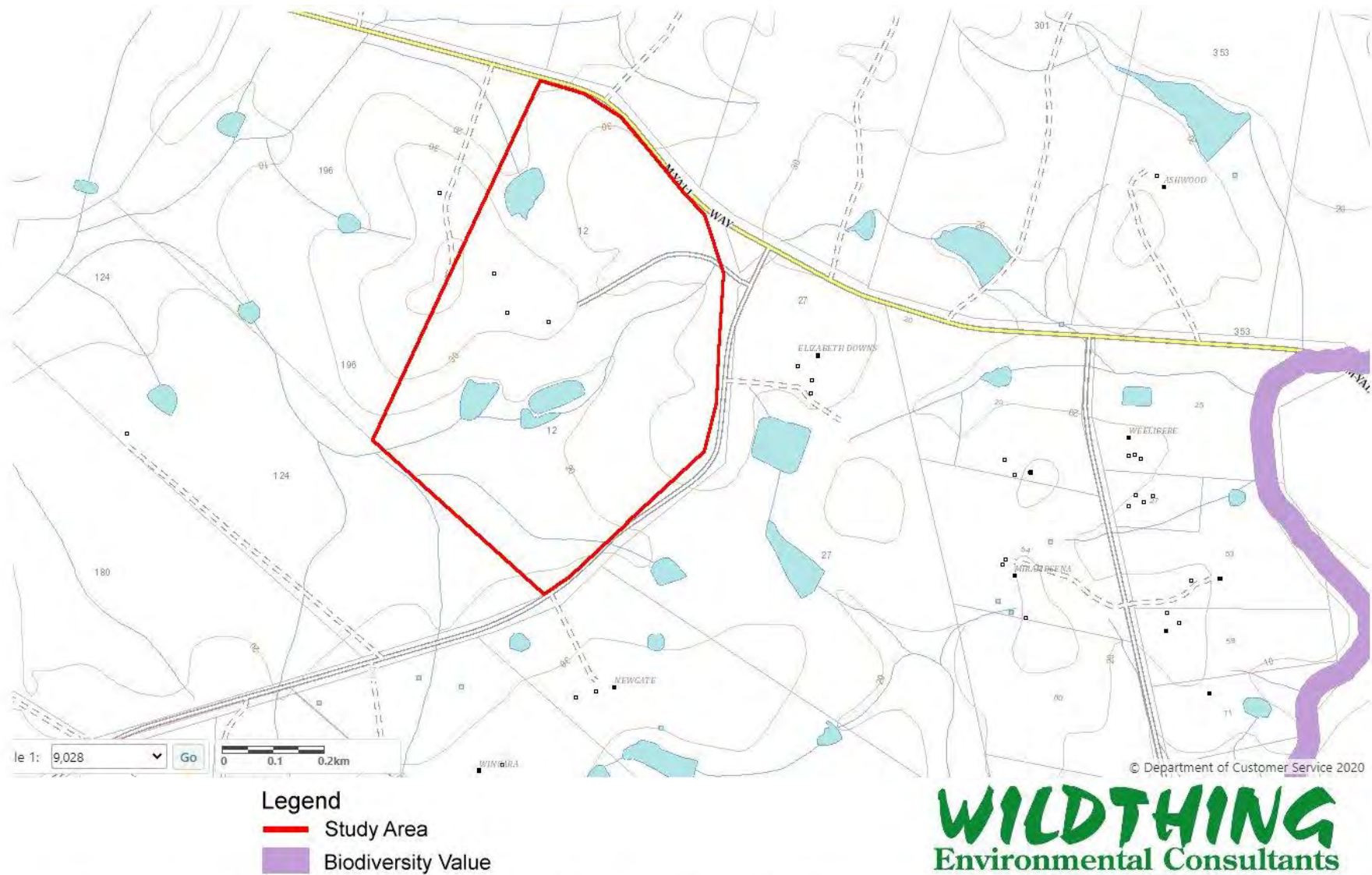


Figure 3.1: Biodiversity Values within the vicinity of the study area (Biodiversity Values Map - 10 June 2020) (DPIE, 2020)

### **3.3 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999**

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a project, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Commonwealth Minister for the Department of the Environment and Energy (DoEE).

MNES categories listed under the EPBC Act are:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities (Section 18 and 18A);
- Migratory species;
- Commonwealth marine areas;
- Nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

Initially MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will require referral to, and may require the approval of, the Commonwealth Minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES.

### **3.4 BIOSECURITY ACT 2015**

The NSW Biosecurity Act 2015 provides regulatory controls and powers to manage noxious weeds in NSW. For weed management this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS).

### **3.5 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2019**

The principal aim of State Environment Planning Policy (Koala Habitat Protection) 2019 (SEPP Koala Habitat Protection), is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This Policy applies to each local government area listed in Schedule 1, of which Mid Coast Council is listed. Mid Coast Council does

not have a current Koala Plan of Management (KPoM). Therefore, the aim of the policy is achieved by requiring that a consent authority's determination of a development application is consistent with Part 3 of the SEPP Koala Habitat Protection Guideline (DPIE, 2020) where there is no KPoM.

The site is larger than 1ha and is mapped under the Koala Development Application Map as containing suitable koala habitat. The site also contained a total of seven Schedule 2 Koala Feed Trees. The proposal does not meet all criteria under Tier 1 of the Development Assessment Process. Therefore, under Tier 2 a Koala Assessment Report has been completed within Appendix D of this report for the proposal.

Detailed analysis of the proposal under the SEPP Koala Habitat Protection is located within Section 12 and Appendix D of this report.

### **3.6 LICENSING**

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under NPWS Scientific Investigation Licence SL100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Department of Primary Industries (Trim File No. 13/251) for Fauna Survey for Biodiversity and Impact Assessment.

## 4.0 METHODOLOGY

### 4.1 DESKTOP ASSESSMENT

A site-specific literature and database review were undertaken prior to conducting the field survey and the preparation of this report. A list of the resources reviewed, the date they were accessed and the spatial extent of the search conducted, where relevant, is provided in Table 4.1.

**Table 4.1: Desktop Resources**

RESOURCE	LAST ACCESS DATE	SPATIAL EXTENT
<b>Biodiversity Values and Landscape Maps</b>		
BioNet Atlas of NSW Wildlife (BioNet) (OEH, 2020a)	28 May 2020	10x10km radius of subject site
Commonwealth Protected Matters Search Tool (PMST) (DoEE 2020b)	28 May 2020	10x10km radius of subject site
NSW Biodiversity Values Map (OEH, 2019b)	5 June 2020	Entire Subject Site
Koala Development Application Map (DPIE, 2020c)	4 June 2020	Entire Subject Site
SIX Maps (DPI 2019)	10 June 2020	Entire Subject Site
Nearmap 2020	11 February 2020	Entire Subject Site
NSW Government SEED Mapping	4 June 2020	Entire Subject Site
Mitchell Landscape Maps, Version 2 (DECC) (2002).	4 June 2020	Entire Subject Site
Australia's IBRA Bioregions and sub-bioregions.	4 June 2020	Entire Subject Site
<b>Threatened Species and Vegetation Databases</b>		
Commonwealth species profiles and threats database (SPRAT) (DoEE 2020a)	5 June 2020	-
OEH Profiles of threatened species, population, and ecological communities (OEH 2020c)	5 June 2020	-
OEH BioNet vegetation classification database (OEH 2020d)	5 June 2020	-

## 4.2 FIELD ASSESSMENT

Fieldwork was undertaken on site between September 2019 and June 2020. A summary of the time spent on site during fieldwork and the prevailing weather conditions at the time is contained in Table 4.2.

**Table 4.2: Survey Dates, Times and Weather Conditions**

DATE	TIME	SURVEY EFFORT (PERSON HOURS)	ACTIVITY	WEATHER
05/09/2019	1130 - 1400	4.5	General site inspection Threatened orchid searches Avifauna survey Vegetation survey Incidental observations	0/8 Cloud, 22°C, 72% Relative humidity, Wind NE 15km/h
12/09/2019	1200 - 1430	2.5	Threatened orchid searches Threatened flora searches Avifauna survey Incidental observations	3/8 Cloud, 24.4°C, 14% Relative humidity, Wind NW 30km/h
09/10/2019	0800 - 1300	10.0 (Two persons)	Threatened orchid searches Threatened flora searches ( <i>Tetratheca juncea</i> ) Avifauna survey Vegetation survey Incidental observations	1/8 Cloud, 15°C, 53% Relative humidity, Wind SW 17km/h
16/12/2019	0730 - 1400	6.5	Vegetation Survey Threatened Orchid Searches Diurnal fauna survey Incidental observations	4/8 Cloud, 22°C, 74% Relative humidity, Wind S 31km/h
16/03/2020	1030 - 1530	10.0 (Two persons)	Trap deployment First Camera Trap deployment Incidental observations	4/8 Cloud, 21°C, 74% Relative humidity, Wind SE 26km/h
17/03/2020	0620 - 0745	1.4	Checking traps Incidental observations	3/8 Cloud, 15°C, 92% Relative humidity, Wind SE 19km/h
18/03/2020	0620 - 0730	1.2	Checking traps Incidental observations	2/8 Cloud, 13.5°C, 88% Relative humidity, Wind SW 2km/h
19/03/2020	0625 - 0740	1.25	Checking traps Incidental observations	0/8 Cloud, 14°C, 84% Relative humidity, Wind NW 7km/h
20/03/2020	0630 - 1000	7 (Two persons)	Checking and retrieval of traps Anabat deployed near dam Second Camera Trap deployed near dam Incidental observations	0/8 Cloud, 14.5°C, 94% Relative humidity, Wind NW 2km/h
24/03/2020	1915 - 1845	1.5	Amphibian Survey Spotlighting Bat Call Survey (Anabat)	6/8 Cloud, 21°C, 70% Relative humidity, Wind N 26km/h
25/03/2020	0930 - 1030	1.0	Avifauna Survey Reptile Survey First Camera Trap retrieval	1/8 Cloud, 20°C, 75% Relative humidity, Wind NW 6km/h



DATE	TIME	SURVEY EFFORT (PERSON HOURS)	ACTIVITY	WEATHER
27/03/2020	1900 - 1830	1.5	Amphibian Survey Spotlighting Bat Call Survey (Anabat)	4/8 Cloud, 24°C, 60% Relative humidity, Wind NE 11km/h
23/04/2020	1000 - 1200	2.0	Vegetation Survey Avifauna Survey Anabat Retrieval Second Camera trap retrieval	2/8 Cloud, 20°C, 55% Relative humidity, Wind NW 13km/h
10/06/2020	1430 - 1900	4.5	Vegetation Survey Amphibian Survey Stagwatch, Spotlighting Call Playback Survey and listening periods	8/8 Cloud, 18°C, Calm, 85% Relative Humidity. Wind NE 16km/h. Rainy.  No moon seen.
11/06/2020	1430 - 1900	4.5	Threatened flora searches Amphibian Survey Stagwatch, Spotlighting Call Playback Survey and listening periods	1/8 Cloud, 17°C, Calm, 85% Relative Humidity. Wind SW 13km/h.  No moon seen.
12/06/2020	1000 - 1400	4.0	Spot Assessment Technique	6/8 Cloud, 16°C, Calm, 88% Relative Humidity. Wind NW 9km/h.

A detailed methodology for the surveys listed within Table 4.2 above have been described in the following Sections 4.2 – 4.3.10:

### **4.3 VEGETATION AND HABITAT ASSESSMENT METHODOLOGY**

The initial determination of the basic vegetation community boundaries was undertaken through the review of an orthophoto covering the site. Following this, a detailed ground survey was conducted in accordance with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004).

Flora searches for threatened species were undertaken across the site in the manner described by Cropper (1993) as the 'Random Meander Technique'. This involved walking in a random manner throughout the entire study site, visiting the full range of potential habitats and checking every plant species seen. A list of all flora species identified on site has been provided in Appendix A.

#### **4.3.1 TARGETED THREATENED FLORA SURVEYS**

Targeted surveys were used in accordance with the NSW Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft) (Department of Environment and Conservation 2004), NSW Guide to Surveying Threatened Plants State of New South Wales (OEH, 2016a) and the Draft survey guidelines for Australia's threatened orchids (DoEE, 2013).

Seasonal surveys during known flowering periods were undertaken to maximise detection of targeted threatened cryptic plant species, particularly *Tetradlea juncea* (Black-eyed Susan). The searches were undertaken by up to two ecologists walking parallel transects (Cropper 1993) which were spaced at approximately 15m intervals across the entire study area. Hand held Global Positioning System (GPS) was used to assist with navigation along the transect. The locations of all individual plants were recorded by the use of GPS. The flowering periods of the targeted cryptic flora are shown in Table 4.3. The track location of targeted threatened flora searches is shown in Figure 4.1.

**Table 4.3: Flowering periods of targeted threatened cryptic flora species.**

SPECIES	Flowering Period months of the year											
	J	F	M	A	M	J	J	A	S	O	N	D
<i>Corybas dowlingii</i>												
<i>Cryptostylis hunteriana</i>												
<i>Diuris arenaria</i>												
<i>Diuris praecox</i>												
<i>Pterostylis chaetophora</i>												
<i>Rhizanthella slateri</i>												
<i>Tetradlea juncea</i>												

#### 4.3.2 GENERAL HABITAT FOR NATIVE SPECIES

From the vegetation appraisal, diurnal fauna survey and a general inspection of the site and surrounding areas, a subjective assessment of the general habitat value of this site was made. Considered in this assessment were:

- occurrence of that habitat type in the general vicinity;
- degree of disturbance and degradation;
- area occupied by that habitat on site;
- continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors; and
- structural and floral diversity.

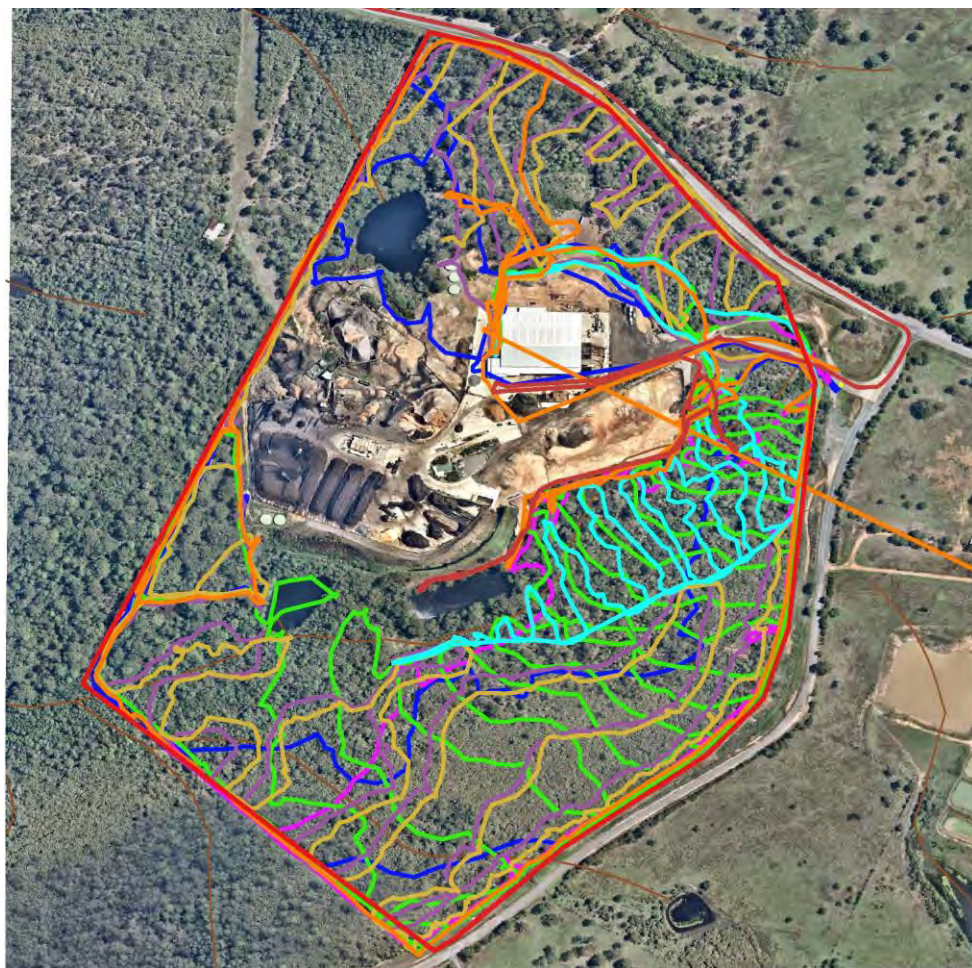
#### 4.3.3 HABITAT FOR SIGNIFICANT SPECIES

The subject site was evaluated as potential habitat for each of the threatened species reported on the BioNet (OEH, 2020) and PMST (DoEE, 2020) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna; and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.4.

#### 4.3.4 HOLLOW BEARING TREE SURVEY

During the fieldwork, a survey was undertaken to identify hollow-bearing trees within the areas to be impacted. Hollow-bearing trees are a habitat resource utilised by a variety of native avifaunal and mammalian species. This resource is usually a limiting factor in the occurrence of hollow-dependent species on a site, due to the time taken for hollows to form in trees. It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured.

Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground.



### Legend

- Study Area
- 20200325\_ANL\_Tracks
- 20190905\_ANL\_Tracks
- 20190912\_ANL\_Tracks
- 20191009\_ANL\_Tracks
- 20191009\_ANL\_Tracks
- 20191216\_ANL\_Tracks
- 20200316\_ANL\_Tracks
- 20200610\_ANL\_Tracks
- 20200611\_ANL\_Tracks

Job Ref	12376
A4 Scale	1:4000

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Map Projection GDA94 MGA Zone 56

Data Sources: Nearmap (2020),

Figure 4.1

### Targeted Flora Surveys

12 Pindimar Road  
 TEA GARDENS, NSW

June 2020

WILDTHING  
 Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215



#### **4.4 TERRESTRIAL FAUNA ASSESSMENT METHODOLOGY**

The methodology adopted consisted of an assessment of the potential use of the site by any Schedule 1 and 2 fauna identified on the OEH and DoEE Databases. This was undertaken by both appraising the extent of likely habitat upon the site, searches for secondary indications of threatened species utilising the site, and incidental observations of native fauna in general. The survey was carried out in accordance with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004).

##### **4.4.1 SMALL TERRESTRIAL MAMMAL TRAPPING**

Terrestrial mammal trapping was undertaken using 40 Elliott Type A traps (8x10x33cm). The traps were left in place for four consecutive nights giving a total of 160 small terrestrial trap nights. The traps were hidden in thick grass, under shrubs or and around trees and were camouflaged with vegetation where the ground cover was sparse. The baits used for the traps were a mixture of rolled oats, peanut butter and honey mixture, and Good-O's (dry dog food). The traps were checked early each morning and, where necessary, reset and rebaited. The location of the small terrestrial traps is shown in Figure 4.2.

##### **4.4.2 MEDIUM TERRESTRIAL MAMMAL TRAPPING**

Medium terrestrial mammal trapping was undertaken using 5 cage traps (60×35×40cm). The traps were left in place for four consecutive nights giving a total of 20 terrestrial trap nights. The traps were hidden in thick grass, under shrubs or near fallen logs and were camouflaged with vegetation where the ground cover was sparse. The bait used for the traps was raw chicken wings. The traps were checked early each morning and where necessary, reset and rebaited. The location of the Medium Terrestrial Mammal trap survey is shown in Figure 4.2.

##### **4.4.3 ARBOREAL TERRESTRIAL MAMMAL TRAPPING**

Arboreal mammal trapping was undertaken using 20 Elliott Type B traps (15 × 15 × 46cm) to determine the presence of arboreal mammals, particularly *Petaurus norfolcensis* (Squirrel Glider) and *Petaurus australis* (Yellow-bellied Glider) which are known to occur in similar habitats in the local area (DPIE, 2020). The traps were left in place for four consecutive nights giving a total of 80 terrestrial trap nights. The traps were placed around 3 - 4 metres above the ground on platforms mounted on tree trunks. Trees, which were targeted, contained hollows, were flowering or had scratches present on the boles. The baits used consisted of a rolled oats, peanut butter and honey mixture, and liquorice. The traps were sprayed with honey mixed in water before being placed in the trees to attract fauna and mask the smell of humans. The tree trunks were also sprayed with this mixture each day. In all cases the traps were checked early each morning and, where necessary, reset and rebaited. The location of the Arboreal Mammal trap survey is shown in Figure 4.2.





Job Ref	12376
A4 Scale	1:2500

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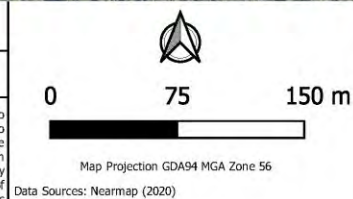


Figure 4.2

### Fauna Trapping Surveys

12 Pindimar Road  
TEA GARDENS, NSW

March 2020

#### 4.4.4 MICROCHIROPTERAN BAT CALL SURVEY

Bat echo-location calls were recorded using an Anabat detector in areas which were considered likely to be used by bats. These positions were selected to sample potential hunting sites for bats, including flyways, clearings and ecotones. Echolocation surveys used a combination of set point and hand held mobile surveys. Mobile Surveys were conducted during spotlighting surveys. Stationary call activated microchiropteran bat detection was also undertaken from dusk to dawn for five nights (19 - 24 March 2020). The transformed calls were analysed using an Anabat V Zero Crossing Analysis Interface feeding into a computer and identified by comparison with sample bat calls. The bat calls recorded by Wildthing Environmental Consultants were analysed in-house by Mungo Worth. The location of the bat call surveys is shown in Figure 4.3.

#### 4.4.5 AMPHIBIAN SURVEY

Amphibian surveys included a combination of diurnal and nocturnal census methods. Systematic searches involved opportunistic searches within appropriate habitat for basking or sheltering individuals. Appropriate cover such as logs was turned over for resting individuals. Nocturnal surveys were undertaken in suitable habitat and involved listening for the characteristic call of male frogs. The location of the amphibian surveys is shown in Figure 4.3.

#### 4.4.6 REPTILE SURVEY

Searches for reptiles involved a combination of diurnal and nocturnal searches. Diurnal searches for reptiles involved searching in likely habitat (i.e. leaf litter, dead logs and long grass) during the morning and afternoon survey period. Nocturnal searches were conducted for reptile species active at night such as geckos and some species of snakes and involved searching in likely habitats with the aid of a spotlight. The location of the reptile surveys is shown in Figure 4.3.

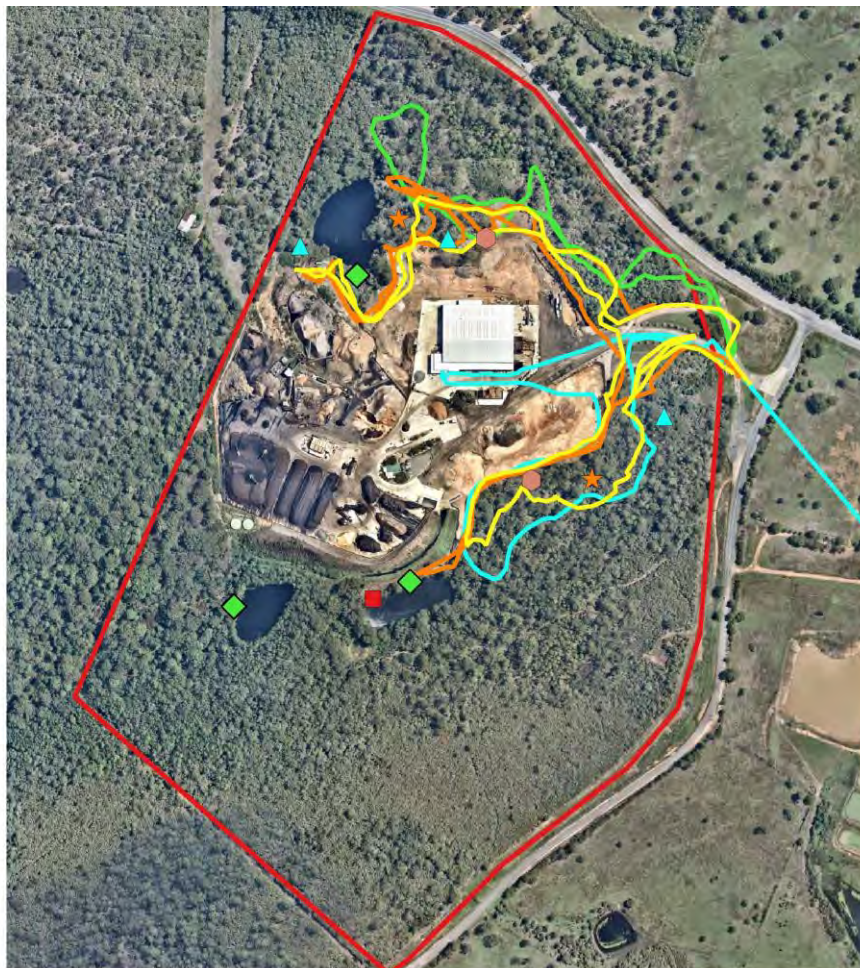
#### 4.4.7 DIURNAL AVIFAUNA SURVEY

The diurnal avifauna survey involved transects targeting potential habitat within the site for species such as *Daphoenositta chrysoptera* (Varied Sittella) and *Glossopsitta pusilla* (Little Lorikeet). Surveys were conducted at peak activity periods (i.e. dawn and dusk) for three periods for half an hour. Incidental observations and secondary indications (i.e. distinctive feathers and nests) of avifauna were also recorded. Searches for chewed cones underneath Allocasuarina trees were also conducted to determine the presence of *Calyptorhynchus lathami* (Glossy Black Cockatoos). The location of the diurnal avifauna surveys is shown in Figure 4.3.

#### 4.4.8 NOCTURNAL AVIFAUNA AND MAMMAL CALL PLAYBACK SURVEY

During the nocturnal avifauna and mammal surveys pre-recorded calls of *Ninox connivens* (Barking Owl), *Ninox strenua* (Powerful Owl), *Tyto novaehollandiae* (Masked Owl), *Tyto tenebricosa* (Sooty Owl), *Burhinus grallarius* (Bush Stone-curlew), *Petaurus australis* (Yellow-bellied Glider) and *Phascolarctos cinereus* (Koala) were broadcast through an amplification system designed to project the sound for at least 1km under still night conditions. An initial listening period of 10 minutes was undertaken, followed by 5 minutes of calls. A period of two minutes of quiet listening was then





Legend

- Owl\_Calls
- Reptile\_Surveys
- Amphibian\_Surveys
- Anabat Stationary
- Avifauna\_Surveys
- Spotlighting Route - 11 June 2020
- Spotlighting Route - 10 June 2020
- Spotlighting Route - 27 March 2020
- Spotlighting/Mobile Bat Call Survey Route - 24 March 2020
- Study Area

Job Ref	12376
A4 Scale	1:6000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 100 200 m

Map Projection GDA94 MGA Zone 56

Data Sources: Nearmap (2019),

Figure 4.3.

Targeted Fauna Surveys

12 Pindimar Road  
 TEA GARDENS, NSW  
 June 2020

employed after each 5-minute bracket of calls. At the conclusion of the call playback survey, spotlighting was carried out in the vicinity of the call playback site. The location of the nocturnal avifauna and mammal call playback surveys is shown in Figure 4.3.

#### **4.4.9 SPOTLIGHTING SURVEY**

Spotlighting was undertaken on foot four nights. The spotlighting surveys undertaken involved walking at a slow pace around the study area and stopping every 2 minutes, allowing the observer to hear movements of animals. The location of the spotlighting surveys is shown in Figure 4.3.

#### **4.4.10 SPOT ASSESSMENT TECHNIQUE (SAT)**

This technique is a tool for determining localised levels of habitat use by Koalas and was undertaken on 12 June 2020. The SAT involved a radial assessment of “Koala activity” within the immediate area surrounding a tree of any species that is known to have been utilised by the species, or otherwise considered to be of some importance for Koala conservation and/or management purposes. In the field the technique was applied as follows:

1. Locate and uniquely mark with flagging tape a tree (the centre tree) that meets one or more of the following selection criteria:
  - a. a tree of any species beneath which one or more Koala faecal pellets have been observed and/or
  - b. a tree in which a Koala has been observed and/or
  - c. any other tree known or considered to be potentially important for the Koala, or of interest for other assessment purposes.
2. identify and uniquely mark the 29 nearest trees to the centre tree,
3. undertake a search for the Koala faecal pellets beneath each of the 30 marked trees based on a cursory inspection of the undisturbed ground surface within a distance of 100 centimetres around the base of each tree, followed (if no faecal pellets are initially detected) by a more thorough inspection involving disturbance of the leaf litter and ground cover within the prescribed search area.

Two-person minutes per tree was dedicated to the faecal pellet search. The search of an individual tree was concluded once a single faecal pellet has been detected or when the maximum search time has expired, whichever happens first. This process was repeated until each of the 30 trees in the site had been assessed.

The SAT assessment was undertaken in three separate locations. The locations and results are located within Appendix D of this report.

#### **4.4.11 CAMERA TRAPPING**

Two camera traps (Reconyx Hyperfire 2) were set up in two different locations within the study area from 16 March 2020 to 25 March 2020 and 20 March 2020 to 23 April 2020. Cameras were set either

for arboreal mammals or terrestrial mammals. The bait for arboreal setups consisted of a rolled oats and honey mixture, peanut butter.

#### 4.5 SIGNIFICANT SPECIES

The subject site was evaluated as potential habitat for each of the threatened species reported on the BioNet (OEH, 2020) and PMST (DoEE, 2020) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.4 and an assessment of the likelihood of occurrence of these threatened species within the subject site is provided in Table 5.3.

**Table 4.4: Threatened species, endangered populations and ecological communities considered.**

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
<b>Flora Species</b>			
* <i>Arthraxon hispidus</i>	Hairy-joint Grass	V	V
<i>Corybas dowlingii</i>	Red Helmet Orchid	E1	
* <i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V
<i>Diuris arenaria</i>	Tomaree Doubletail	E1	
<i>Diuris praecox</i>	Newcastle Doubletail	V	V
<i>Genoplesium littorale</i>	Tuncurry Midge Orchid	E4A	CE
<i>Pterostylis chaetophora</i>		V	
* <i>Phaius australis</i>	Lesser Swamp Orchid	E1	E
<i>Tetraloche juncea</i>	Black-eyed Susan	V	V
<i>Prostanthera densa</i>	Villous Mint-bush	V	V
<i>Angophora inopina</i>	Charmhaven Apple	V	V
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	
* <i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	V
* <i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V
<i>Melaleuca groveana</i>	Grove's Paperbark	V	
<i>Rhodamnia rubescens</i>	Scrub Turpentine	E4A	
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E1	V
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flowered Grevillea	V	V
* <i>Cynanchum elegans</i>	White-flowered Wax Plant		E
* <i>Persicaria elatior</i>	Tall Knotweed	V	V
<i>Chamaesyce psammogeton</i>	Sand Spurge	E1	
* <i>Asperula asthenes</i>	Trailing Woodruff	V	V
* <i>Thesium australe</i>	Austral Toadflax	V	V
<b>Invertebrates</b>			
* <i>Synemon plana</i>	Golden Sun Moth	E1	CE
<b>Amphibians</b>			
<i>Crinia tinnula</i>	Wallum Froglet	V	
* <i>Litoria aurea</i>	Green and Golden Bell Frog	E1	V
<i>Litoria brevipalmata</i>	Green-thighed Frog	V	
<i>Mixophyes balbus</i>	Stuttering Frog	E1	V
* <i>Mixophyes iteratus</i>	Giant Barred Frog	E1	E
<b>Birds</b>			
<i>Limosa lapponica</i>	Bar-tailed Godwit		M
* <i>Limosa lapponica menzbieri</i>	Northern Siberian Bar-tailed Godwit		CE
<i>Limosa limosa</i>	Black-tailed Godwit	V	M
* <i>Actitis hypoleucos</i>	Common Sandpiper		M
* <i>Tringa nebularia</i>	Common Greenshank		M
* <i>Tringa stagnatilis</i>	Marsh Sandpiper		M



Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
<i>Xenus cinereus</i>	Terek Sandpiper	V	M
* <i>Arenaria interpres</i>	Ruddy Turnstone		M
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler		M
* <i>Calidris acuminata</i>	Sharp-tailed Sandpiper		M
<i>Calidris alba</i>	Sanderling	V	M
* <i>Calidris canutus</i>	Red Knot		M
* <i>Calidris ferruginea</i>	Curlew Sandpiper	E1	CE & M
* <i>Calidris melanotos</i>	Pectoral Sandpiper		M
<i>Calidris ruficollis</i>	Red-necked Stint		M
* <i>Calidris tenuirostris</i>	Great Knot		CE & M
<i>Numenius madagascariensis</i>	Eastern Curlew		CE & M
* <i>Numenius minutus</i>	Little Curlew		M
<i>Numenius phaeopus</i>	Whimbrel		M
* <i>Pachyptila turtur subantarctica</i>	Fairy Prion		V
* <i>Charadrius bicinctus</i>	Double-banded Plover		M
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	V
* <i>Charadrius mongolus</i>	Lesser Sand-plover	V	M
* <i>Pluvialis fulva</i>	Pacific Golden Plover		M
* <i>Pluvialis squatarola</i>	Grey Plover		M
* <i>Thinornis rubricollis rubricollis</i>	Hooded Plover (eastern)	CE	V
<i>Gallinago hardwickii</i>	Latham's Snipe		M
* <i>Gallinago megala</i>	Swinhoe's Snipe		M
* <i>Gallinago stenura</i>	Pin-tailed Snipe		M
* <i>Rostratula benghalensis australis</i>	Australian Painted Snipe	E1	V & M
* <i>Botaurus poiciloptilus</i>	Australasian Bittern	E1	E
<i>Ixobrychus flavicollis</i>	Black Bittern	V	
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	
<i>Burhinus grallarius</i>	Bush Stone-curlew	E1	
<i>Esacus magnirostris</i>	Beach Stone-curlew	E4A	
* <i>Sternula nereis nereis</i>	Australian Fairy Tern		V
<i>Sternula albifrons</i>	Little Tern	E1	M
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	
<i>Lathamus discolor</i>	Swift Parrot	E1	CE
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	
<i>Apus pacificus</i>	Fork-tailed Swift		M
<i>Hirundapus caudacutus</i>	White-throated Needletail		M
* <i>Monarcha melanopsis</i>	Black-faced Monarch		M
* <i>Monarcha trivirgatus</i>	Spectacled Monarch		M
* <i>Myiagra cyanoleuca</i>	Satin Flycatcher		M
* <i>Rhipidura rufifrons</i>	Rufous Fantail		M
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	
* <i>Cuculus optatus</i>	Oriental Cuckoo		M
* <i>Anthochaera phrygia</i>	Regent Honeyeater	E4A	CE & M
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	
<i>Chthonicola sagittata</i>	Speckled Warbler	V	
<i>Epthianura albifrons</i>	White-fronted Chat	V	
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V	
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	
* <i>Grantiella picta</i>	Painted Honeyeater	V	V
* <i>Dasyornis brachypterus</i>	Eastern Bristlebird	E1	E
<i>Hieraaetus morphnoides</i>	Little Eagle	V	
<i>Pandion cristatus</i>	Eastern Osprey	V	M
* <i>Erythrotriorchis radiatus</i>	Red Goshawk	E4A	V
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	V	
<i>Ninox connivens</i>	Barking Owl	V	
<i>Ninox strenua</i>	Powerful Owl	V	
<i>Tyto longimembris</i>	Eastern Grass Owl	V	
<i>Tyto novaehollandiae</i>	Masked Owl	V	

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
<i>Tyto tenebriosa</i>	Sooty Owl	V	
<b>Mammals</b>			
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll	V	V
<i>*Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	
<i>Phascolarctos cinereus</i>	Koala	V	
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo	V	V
<i>Petaurus australis</i>	Yellow-bellied Glider	V	
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	
<i>Petauroides volans</i>	Greater Glider		V
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	
<i>Psuedomys novaehollandiae</i>	New Holland Mouse		V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V	
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	
<i>Miniopterus australis</i>	Little Bentwing-bat	V	
<i>Miniopterus schreibersii oceanensis</i>	Large Bentwing-bat	V	
<i>Myotis macropus</i>	Large-footed Myotis	V	
<i>Phoniscus papuensis</i>	Golden-tipped Bat	V	
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	
<i>Chalinolobus dwyeri</i>	Large Pied Bat	V	V
<b>Endangered Populations</b>			
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area		E2	
Koala, Hawks Nest and Tea Gardens population		E2	V
<b>Endangered Ecological Communities</b>			
Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland ecological community			E
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	E
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E3	
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	CE
Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion		E3	
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V2	
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E3	
Lowland Rainforest of Subtropical Australia		E3	CE

E=Endangered Species    E3=Endangered Ecological Community    V=Vulnerable Species  
V2= Vulnerable Ecological Community    E4A/E4B/CE=Critically Endangered    M=Migratory Species

## 5.0 RESULTS

### 5.1 FLORA ASSEMBLAGES

The vegetation of the subject site was stratified by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database, the following PCTs were present within the study area:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion;
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands;
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast.
- Highly Disturbed Vegetation;
- Aquatic Dam Vegetation.

A comprehensive description of these assemblages present within the study area is provided within Tables 5.1 and 5.2. Figure 5.1 provides a map of the extent of vegetation within the site. A full list of the flora species recorded during the fieldwork is listed in Appendix A.

*\*Note on Vegetation Community Distribution Map. A map of vegetation of any area seeks to describe the distribution of the plant species in that area by defining a number of vegetation units (assemblages or communities) which are relatively internally homogenous. Whilst such mapping is a convenient tool, it greatly oversimplifies the real situation. Plants rarely occur in defined communities with distinct boundaries. Accordingly, vegetation units used for the accompanying map should be viewed as indicative of their extent rather than being precise edges of communities.*





### Legend

#### Vegetation\_Map

- PCT 1213
- PCT 1619
- PCT 1715
- PCT 1722
- Dam Aquatic Vegetation
- Highly Disturbed Vegetation
- Bushfire\_APZ\_24m

#### 214200\_DA SHED\_MAY\_2020\_c\_final entities

- BATTER
- PROPOSED\_BATTER
- PROPOSED\_CAR\_PARK
- PROPOSED\_CONCRETE\_BARRIER
- PROPOSED\_FOGO
- PROPOSED\_PIPES
- PROPOSED\_RET\_WALL\_HATCH
- PROPOSED\_ROAD\_EDGE
- PROPOSED\_SHED
- PROPOSED\_TANKS
- Study Area

Job Ref	12376
A4 Scale	1:6000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

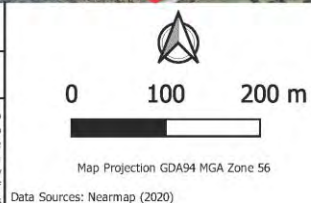


Figure 5.1

### Vegetation Map

12 Pindimar Road  
TEA GARDENS, NSW

June 2020

**WILDTHING**  
Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215

Table 5.1: Details of PCT 1213

PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion;	
Vegetation Formation	Dry Sclerophyll Forest (Shrubby sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Extent within study area	10.20ha
Extent within development footprint	0.33ha 0.08ha Modified for Bushfire APZ
Description of this Plant Community Type occurring on site.	<p>This community was dominated by the canopy <i>Eucalyptus siderophloia</i> (Grey Ironbark), <i>Eucalyptus propinqua</i> (Small-fruited Grey Gum) and <i>Corymbia maculata</i> (Spotted Gum). Other canopy species included <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark), <i>Corymbia gummifera</i> (Red Bloodwood) and <i>Eucalyptus globoidea</i> (White Stringybark)</p> <p>Common Mid Storey species included <i>Allocasuarina torulosa</i> (Forest Oak)</p> <p>Common shrub species were <i>Dodonaea triquetra</i> (Common Hop Bush), <i>Pultenaea villosa</i> (Hairy Bush Pea), <i>Leucopogon juniperinus</i> (Prickly Bearded Heath), <i>Acacia longifolia</i> (Sydney Golden Wattle) and <i>Breynia oblongifolia</i> (Breynia).</p> <p>The ground cover was composed of species such as <i>Themeda australis</i> (Kangaroo Grass), <i>Imperata cylindrica</i> var. <i>major</i> (Blady Grass) and <i>Pteridium esculentum</i> (Bracken Fern).</p>
Associated Species* - NSW Vegetation Information System (VIS) classification database. *The associated species which were present within the site and informed assignment of this PCT have been made bold	<p><b>Canopy</b> - <i>Corymbia maculata</i>; <i>Eucalyptus siderophloia</i>; <i>Eucalyptus crebra</i>; <i>Eucalyptus punctata</i>; <i>Eucalyptus fibrosa</i>; <i>Eucalyptus acmenoides</i>; <i>Eucalyptus moluccana</i>; <i>Eucalyptus tereticornis</i>;</p> <p><b>Mid-Storey</b> - <i>Acacia falcata</i>; <i>Acacia implexa</i>; <i>Allocasuarina torulosa</i>; <i>Breynia oblongifolia</i>; <i>Glycine clandestina</i>, <i>Hardenbergia violacea</i>; <i>Leucopogon juniperinus</i>; <i>Persoonia linearis</i></p> <p><b>Ground Covers</b>: <i>Aristida vagans</i>; <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>; <i>Cymbopogon refractus</i>; <i>Dianella caerulea</i>, <i>Echinopogon ovatus</i>; <i>Entolasia stricta</i>; <i>Lomandra multiflora</i> subsp. <i>multiflora</i>; <i>Microlaena stipoides</i> var. <i>stipoides</i>; <i>Pratia purpurascens</i>; <i>Vernonia cinerea</i> var. <i>cinerea</i>;</p>
TEC Status	This community is not consistent with any listed TEC.





**Plate 1: PCT 1213 – North-west of study area**



**Plate 2: PCT 1213 – Central eastern part of study area.**



Table 5.2: Details of PCT 1619.

PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation);
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests;
Extent within development footprint	0.04ha clearing 0.04ha Modified Bushfire APZ
Extent within study area	4.08ha
Description of this Plant Community Type occurring on site.	<p>Common canopy species were <i>Eucalyptus globoidea</i> (White Stringybark), <i>Angophora costata</i> (Smooth-barked Apple), <i>Corymbia gummifera</i> (Red Bloodwood).</p> <p>Common Mid-storey species were <i>Allocasuarina littoralis</i> (Black Sheoak), <i>Glochidion ferdinandi</i> (Cheese Tree).</p> <p>Common Ground Covers were <i>Themeda australis</i> (Kangaroo Grass), <i>Pteridium esculentum</i> (Bracken Fern). <i>Doryanthes excelsa</i> (Gymea Lily).</p>
Associated Species* - NSW Vegetation Information System (VIS) classification database. *The associated species which were present within the site and informed assignment of this PCT have been made bold	<p><u>Upper Stratum Species</u>  <b><i>Angophora costata</i></b>; <b><i>Corymbia gummifera</i></b>; <i>Eucalyptus capitellata</i>;</p> <p><u>Mid/shrub Stratum Species</u>  <i>Banksia spinulosa</i>; <i>Allocasuarina littoralis</i>; <i>Xanthorrhoea latifolia</i>; <i>Leptospermum polygalifolium</i>; <i>Acacia myrtifolia</i>; <i>Persoonia levis</i>; <i>Persoonia linearis</i>; <i>Billardiera scandens</i>.</p> <p><u>Ground Cover</u>  <b><i>Themeda australis</i></b>; <b><i>Panicum simile</i></b>; <i>Aristida vagans</i>; <b><i>Dianella caerulea</i></b>; <b><i>Lepidosperma laterale</i></b>; <b><i>Lomandra obliqua</i></b>; <i>Goodenia heterophylla</i>;</p>
TEC Status	This community is not consistent with any listed TEC.



Plate 3: PCT 1619. South-west of study area.



Plate 4: PCT 1619. South-west of study area.



Table 5.3: Details of PCT 1715

PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;	
Vegetation Formation	
Vegetation Class	
Extent within development footprint	10.79ha
Extent within study area	0ha
Description of this Plant Community Type occurring on site.	This assemblage was characterised by a very dense layer of paperbarks particularly <i>Melaleuca nodosa</i> (Ball Honeymyrtle). Other paperbark species included <i>Melaleuca linearifolia</i> (Snow in Summer). Canopy trees were generally well spaced with common species being, <i>Corymbia maculata</i> (Spotted Gum), <i>Eucalyptus tereticornis</i> (Forest Red Gum) and <i>Angophora floribunda</i> (Rough-barked Apple).
Associated Species* - NSW Vegetation Information System (VIS) classification database. *The associated species which were present within the site and informed assignment of this PCT have been made bold	<p><u>Upper Stratum</u>  <i>Eucalyptus resinifera</i>;</p> <p><u>Mid Stratum</u>  <i>Melaleuca nodosa</i>; <i>Leptospermum polygalifolium</i>; <i>Glochidion ferdinandi</i>; <i>Acacia longifolia</i>; <i>Melaleuca linariifolia</i>;</p> <p><u>Ground Layer</u>  <i>Imperata cylindrica</i>; <i>Lomandra longifolia</i>; <i>Dianella caerulea</i>; <i>Gahnia clarkei</i>; <i>Entolasia stricta</i>; <i>Themeda australis</i>.</p>
TEC Status	This community has some similarities to the state listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast however was unlikely to be this TEC.
Photos	Photos of this community on site are shown in Plates 5 & 6.





Plate 5: PCT 1715



Plate 6: PCT 1715



Table 5.4: Details of PCT 1722

PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;	
Vegetation Formation	Forested Wetlands;
Vegetation Class	Coastal Swamp Forests;
Extent within development footprint	0ha
Extent within study area	2.6ha
Description of this Plant Community Type occurring on site.	<p>This vegetation assemblage was associated with the lower areas of ground within the study area associated with the drainage lines. Canopy species varied and included specimens of <i>Angophora floribunda</i> (Rough-barked Apple), <i>Eucalyptus robusta</i> (Swamp Mahogany) and <i>Casuarina glauca</i> (Swamp Oak). Common mid-storey species were <i>Melaleuca styphelioides</i> (Prickly-leaved Paperbark), and <i>Melaleuca linariifolia</i> (Snow in Summer).</p> <p>Common ground covers included <i>Gahnia clarkei</i> (Sword Grass).</p>
Associated Species* - NSW Vegetation Information System (VIS) classification database. *The associated species which were present within the site and informed assignment of this PCT have been made bold	<p><u>Upper Stratum</u>  <b><i>Eucalyptus robusta</i></b>; <i>Livistona australis</i>; <i>Acmena smithii</i>; <b><i>Casuarina glauca</i></b>;  <u>Mid Stratum</u>  <i>Pittosporum undulatum</i>; <b><i>Glochidion ferdinandi</i></b>; <b><i>Melaleuca linariifolia</i></b>; <b><i>Melaleuca styphelioides</i></b>;  <u>Ground Layer</u>  <b><i>Hypolepis muelleri</i></b>; <i>Gahnia clarkei</i>; <i>Adiantum aethiopicum</i>; <b><i>Commelina cyanea</i></b>;</p>
TEC Status	This community was found to be consistent with the state listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.
Photos	Photos of this community on site are shown in Plates 7–8.





Plate 7: PCT 1722



Plate 8: PCT 1722

**Table 5.5: Details of Aquatic Dam\_Vegetation**

<b>PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion;</b>	
<b>Vegetation Formation</b>	NA
<b>Vegetation Class</b>	NA
<b>Extent within study area</b>	
<b>Extent within development footprint</b>	0ha the northern dam is proposed to be expanded.
<b>Description of this Plant Community Type occurring on site.</b>	Five contracted dams were present within the site. Flora species recorded within the dams included <i>Typha orientalis</i> (Cumbungi).
<b>Associated Species* - NSW Vegetation Information System (VIS) classification database. *The associated species which were present within the site and informed assignment of this PCT have been made bold</b>	NA
<b>TEC Status</b>	This community is not consistent with any listed TEC.





**Plate 10: Constructed in the south-west of the study area (Dam No. 1)**



**Plate 11: Larger constructed dam in the centre of the study area (Dam 2)**





**Plate 12: Constructed in the north-west of the study area (Dam No. 3).**



**Plate 13: Smaller constructed dam in the centre east of the study area.**



**Table 5.6: Highly Disturbed Vegetation**

Maintained Exotic Groundcover	
Vegetation Formation	NA
Vegetation Class	NA
Extent within Site	
Vegetation Description	Areas of highly modified vegetation were present within and on the periphery of the existing development. Areas included maintained lawns, and vegetation growing out of piles of soil and debris and existing basins to the south of the existing development. Common plants included the introduced <i>Pennisetum clandestinum</i> (Kikuyu).
TEC Status	NA

### 5.1.1 ENDANGERED AND VULNERABLE ECOLOGICAL COMMUNITIES

Seven Endangered Ecological Communities (EEC) listed under the TSC Act 1995 are known to occur within the local area:

- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South-East Corner Bioregions;
- Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions;
- River Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions;
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions;
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions;
- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South-East Corner bioregions;
- Subtropical Coastal Floodplain Forest of the NSW North Coast, Sydney Basin and South-East Corner bioregions (SCFF).

Five threatened Ecological Communities listed under the EPBC Act 1999 are considered to have suitable habitat within the local area:

- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia;
- Lowland Rainforest of Subtropical Australia;
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community;
- *Posidonia australis* seagrass meadows of the Manning-Hawkesbury ecoregion;
- Subtropical and Temperate Coastal Saltmarsh.

Approximately 2.6ha of the state listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions was present on the

lower ground in the southern half of the study area. This TEC will not be directly impacted as a result of the proposal.

### 5.1.2 ENDANGERED POPULATIONS

The Emu population in the NSW North Coast Bioregion and Port Stephens LGA has been previously recorded within 10km of the site according to the BioNet database (DPIE, 2020). The proposal is unlikely to have a significant impact on this population such that a viable local population would be placed at risk of extinction.

### 5.1.3 THREATENED FLORA SPECIES

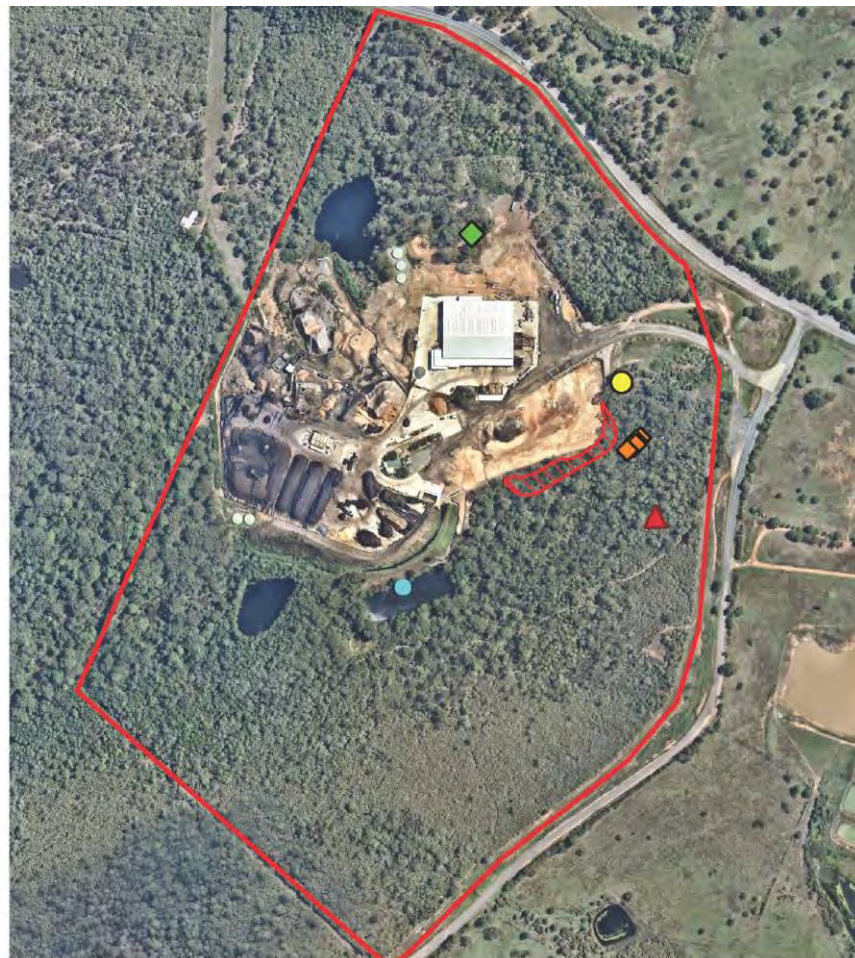
One threatened flora species, *Callistemon linearifolius* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Sixteen additional threatened flora species were also considered to have potential habitat within the study area as a result of the presence of suitable habitat and database searches. These flora species were:

- *Cryptostylis hunteriana* (Leafless Tongue-orchid);
- *Corybas dowlingii* (Red Helmet Orchid);
- *Diuris praecox* (Newcastle Doubletail);
- *Diuris arenaria* (Tomaree Doubletail)
- *Pterostylis chaetophora* (Tall Rustyhood);
- *Tetradlea juncea* (Black-eyed Susan)
- *Angophora inopina* (Charmhaven Apple);
- *Rhodamnia rubescens* (Scrub Turpentine);
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum);
- *Syzygium paniculatum* (Magenta Lilly Pilly)
- *Melaleuca biconvexa* (Biconvex Paperbark)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea);
- *Cynanchum elegans* (White-flowered Wax Plant);
- *Persicaria elatior* (Tall Knotweed);
- *Asperula asthenes* (Trailing Woodruff);
- *Eucalyptus glaucina* (Slaty Red Gum).

Of these listed species the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetradlea juncea* (Black-eyed Susan). No suitable habitat is considered to be available for the remaining species. The location of the *Callistemon linearifolius* specimens are shown in Figure 5.2. The impact of the proposal on threatened flora species has been addressed in Section 7.0 and Appendix A of this report.

### 5.1.4 PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE

Four priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 5.4. The site lies within the Hunter Local Land Services Region.



#### Legend

- Bushfire\_APZ\_24m
- Study Area

#### Threatened Fauna

- Callistemon\_linearifolius
- Glossy Black Cockatoo
- Squirrel Glider
- Little Lorikeet
- Recorded Threatened Bats

Job Ref	12376
A4 Scale	1:6000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

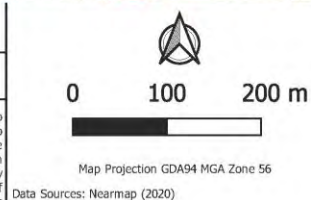


Figure 5.2:

#### Threatened Species - Locations

12 Pindimar Road  
 TEA GARDENS, NSW

June 2020

**WILDTHING**  
 Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215



**Table 5.4: Priority Weed species found within the study area.**

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou Bush).	Biosecurity Zone	T, N
<i>Senecio madagascariensis</i> (Fireweed)	General Biosecurity Duty Prohibition on dealings	N
<i>Lantana camara</i> (Lantana)	General Biosecurity Duty Prohibition on dealings	T, N
<i>Senecio madagascariensis</i> Fireweed	General Biosecurity Duty Prohibition on dealings	N
<i>Rubus fruticosus</i> aggregate	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure*	N
<i>Asparagus</i> species	General Biosecurity Duty Prohibition on dealings	

T – Listed as a Threatening Process under the NSW TSC Act 1995.

N – Weed of National Significance.

**\*Priorities under the Biosecurity Act 2015**

**General Biosecurity Duty** - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).

**Prohibition on dealings** - Must not be imported into the State or sold

**Biosecurity Zone** - Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone

**Regional Recommended Measure** - Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

*Pinus elliotii* (Slash Pine) was particularly invasive within parts of the study area. General control of the remaining weed species above should be integrated in the general land management regime of the site.

## 5.2 HABITAT APPRASIAL

### 5.2.1 HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY

The vegetation and landforms present within the site offer potential habitat for a number of native species. The broad habitat type within the site consisted of open dry forest, swamp forest and maintained introduced grassland, a detailed description of the habitat value of each broad habitat type has been provided below.

#### Dry Sclerophyll Forest

Dry Sclerophyll Forest within the study area would provide suitable habitat opportunities for a variety of species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would all find potential foraging resources within this complex. A relatively small number of hollow-bearing trees were present which would provide nesting and roosting sites for a variety of avifauna and other hollow dependant species such as arboreal mammals and tree-roosting bats. Hunting opportunities as part of a larger exist for birds of prey, given that the variable tree coverage and understorey vegetation has created a myriad of ecotones and habitat densities. Such habitat is suitable for terrestrial species including small and medium sized mammals, macropods, reptiles and potentially for some frog species adapted to drier areas.

#### Swamp Sclerophyll Forest

Swamp Sclerophyll Forest occurring along lower drainage lines provided suitable habitat opportunities for a variety of species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would all find potential foraging resources within this complex. Flowering specimens of *Eucalyptus robusta* (Swamp Mahogany) and paperbark species would provide a seasonal food source for Flying-Foxes and nectivorous bird species. The few hollow-bearing trees provided nesting and roosting opportunities for hollow dependent species such as arboreal mammals, tree-roosting bats and nesting avifauna. Surface water collected in low lying areas was found to be ephemeral in nature and would be dry for the majority of the year. This area would provide habitat for amphibians during periods of high rainfall.

#### Constructed Dams

Five constructed dams within the study area provide suitable habitat for a range of frog, reptile, mammal and waterbird species. These areas would also act as a water source for other native animals such as macropods and offer potential hunting habitat for microchiropteran bats such as *Myotis macropus* (Large-footed Myotis) that prefer to hunt above or around water bodies.

#### Maintained Exotic Groundcover

Maintained exotic groundcover would only provide habitat for a small number of species such as granivorous and insectivorous birds, macropods and microchiropteran bat species would find potential foraging resources as part of a larger home range.

According to the National Parks and Wildlife Service Key Habitats and Corridors for Forest Fauna-Occasional Paper 32 – Figure 7.20 (Scott, 2003) the subject site is located on an area of Key Habitat and forms part of a regional corridor running north-west to south-east. Considering the highly degraded vegetation community at this location, the relatively small scale of the proposal and taking into account the large area of surrounding habitat it is not likely to have a significant impact on this corridor.

### **5.2.2 HABITAT CORRIDORS**

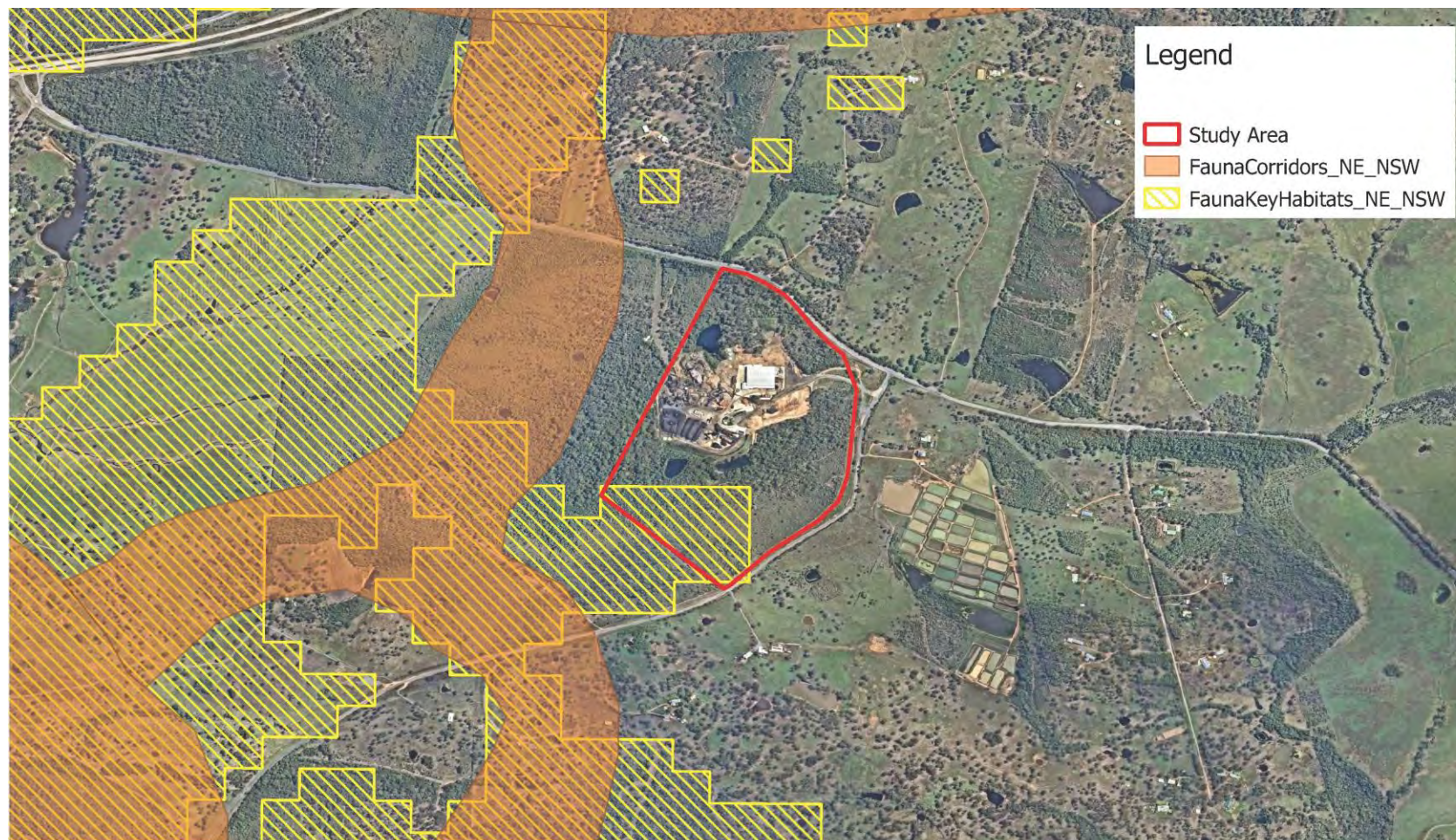
According to the National Parks and Wildlife Service Key Habitats and Corridors for Forest Fauna-Occasional Paper 32 – Figure 7.20 (Scott, 2003) an area of Key Habitat was located within the south of the study area outside the area of impact. This area of Key Habitat is connected to a corridor which runs north-south approximately 250m to the west of the study area. Considering the relatively small scale of the proposal and taking into account the large area of surrounding habitat it is not likely to have a significant impact on corridors or Key Fauna Habitat. Figure 5.3 shows the location of the corridor and Key Fauna Habitat in relation to the study area.



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### **5.3 HABITAT FOR SIGNIFICANT SPECIES**

An assessment of habitat attributes on site has been undertaken for the significant species listed in Table 4.4. The results of the assessment using definitions shown in Table 5.5 are displayed in Table 5.6. Threatened species identified in this assessment as having potential habitat available on site have been considered further in Section 7.0 of this report.



Job Ref	12376
A4 Scale	1:10000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.



Map Projection GDA94 MGA Zone 56

Data Sources: Nearmap (2020),  
 Scotts (2003)

Figure 5.3.

### Key Habitats and Corridors

12 Pindimar Road  
 TEA GARDENS, NSW

June 2020

**WILDTHING**  
 Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215



**Table 5.5: Definitions of likelihood of occurrence criteria.**

Likelihood of Occurrence	Threatened Fauna	Threatened Flora
Unlikely	Suitable habitat is absent from the study area and/or the study area is outside of the species known distribution	
Low	<ul style="list-style-type: none"> <li>The species has not been recorded in the locality (10km) within the last five years; and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a highly modified, limited or degraded state; and/or</li> <li>This species may be an occasional visitor, but habitat similar or of higher quality is widely distributed in the local area.</li> </ul>	<ul style="list-style-type: none"> <li>The species has not been recorded in the locality (10km) within the last five years, and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a highly modified or degraded state</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is unlikely to be dependent on habitat within the study area (i.e. for breeding or important life cycle periods) or to maintain a permanent resident population. However, the species may seasonally, opportunistically or occasionally use resources within the study area; and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a moderately modified, limited or degraded state</li> </ul> <p>This category includes fauna species that were targeted by seasonal surveys and were not recorded, wide ranging species which may fly-over' the site, regardless of the habitat types present and generalist species with non-specific habitat requirements</p>	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or.</li> <li>Although potential habitat is present in the study area the suitable habitat is in a moderately modified or degraded state.</li> </ul> <p>This category includes flora species that were targeted by seasonal surveys and were not recorded.</p>
High	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is highly likely that the species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods) and is likely to maintain a resident population. This includes species that are known to visit the study area during regular seasonal movements or migration.</li> </ul>	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is highly likely to inhabit the study area and is dependent on identified suitable habitat.</li> </ul>
Known	The species was observed in the study area during the current survey and/or was recorded during a survey conducted on the site during the last 5 years.	

**Table 5.6: Habitat Assessment for Significant Species**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
FLORA					
<i>Arthraxon hispidus</i> Hairy-joint Grass		V		Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps. Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common.	<b>Unlikely</b> No preferred habitat was present. No known local records.
<i>Corybas dowlingii</i> Red Helmet Orchid	E1		No	Forms colonies and typically grows in gullies in tall open forest on well-drained gravelly soil at elevations of 10-200m. Is restricted to New South Wales where it is currently known from 4 localities including Port Stephens (2 localities), Bulahdelah and Freemans Waterhole south of Newcastle. A population is known from Stoney Ridge Reserve on Soldiers Point on the southern shore of Port Stephens.	<b>Low</b> No preferred habitat in the form of areas of well drained gravelly soil was present within the study area.
<i>Cryptostylis hunteriana</i> Leafless Tongue-orchid	V	V	No	Is a saprophyte, which grows in small, localised colonies on flat plains close to the coast. Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. Is known to occur at Lemon Tree Passage, Salt Ash and Nelson Bay, Bulahdelah and Lake Macquarie. A major population of this species was located at Bulahdelah within the Bypass area where the largest population has been found.	<b>Low</b> Suitable habitat was considered to be present within the study area.
<i>Diuris arenaria</i> Tomaree Doubletail	E1		Yes	Depicted to exist in a great variety of environments including coastal heath woodlands (Jones 1999), dry sclerophyll forests (Bishop 2000) and open grasslands. Endemic to the Tomaree Peninsula Port Stephens (Jones, 1999, Bishop 2000) where it has a wide distribution. Colonies known to occur in Nelson Bay, Shoal Bay, Anna Bay, Tomaree National Park, Worimi Conservation Lands and Bobs Farm.	<b>Low</b> No preferred habitat was present. No known records north of the northern shore of Port Stephens.
<i>Diuris praecox</i> Newcastle Doubletail	V	V	No	Known from between Bateau Bay and Smiths Lake. Large populations have been recorded within power line easements at Anna Bay, Bobs Farm and Adamstown Heights. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	<b>Low</b> Suitable habitat was considered to be present within the area of dry sclerophyll forest.
<i>Genoplesium littorale</i> Tuncurry Midge Orchid	E4A	CE		Known only from a small area in the Great Lakes Local Government Area just north of Tuncurry on the NSW mid-north Coast. Grows in coastal heath close to the ocean in deep, well-drained sandy soils. The vegetation consists of a variety of shrub species such as <i>Leptospermum laevigatum</i> , <i>Monotoca elliptica</i> , <i>Ochrosperma lineare</i> and <i>Banksia</i> spp. Lichens and various graminoids are often present alongside the orchids.	<b>Unlikely</b> No preferred habitat was present. No known local records.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAIL		
<i>Pterostylis chaetophora</i> Tall Rustyhood	V			The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey. In NSW, it is currently known from 18 scattered locations in a relatively small area between Taree and Kurri Kurri, extending to the south-east towards Tea Gardens and west into the Upper Hunter, with additional records near Denman and Wingen. This species has also been recorded near Grahamstown Dam near Medowie (Pers.com. Steve Lewer OEH).	<b>Moderate</b> Suitable habitat was considered to be present.
<i>Phaius australis</i> Lesser Swamp Orchid	E1	E		Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south, to Port Macquarie. Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	<b>Unlikely</b> Whilst suitable habitat was considered to be present within the area of swamp forest, this orchid species has not been recorded south of Port Macquarie.
<i>Tetradlea juncea</i> Black-eyed Susan	V	V		Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	<b>Moderate</b> Suitable habitat was present.
<i>Prostanthera densa</i> Villous Mint-bush	V	V		This species is known to occur on clay soils on volcanic hills and on sandy soils occurring as a shallow mantle over volcanic hills. It has been reported generally from sclerophyll forest and shrubland on coastal headlands and near-coastal ranges, chiefly on sandstone. The closest records are likely to occur on Gang Gang Hill, Nelson Bay well to the north of the study area.	<b>Unlikely</b> No suitable habitat was present.
<i>Angophora inopina</i> Charmhaven Apple	V	V	No	Found in shallow sandy soils within open woodland/forest assemblages in co-dominant distribution with <i>Eucalyptus haemastoma</i> (Scribbly Gum), <i>Corymbia gummifera</i> (Red Bloodwood) and <i>Eucalyptus capitellata</i> (Brown Stringybark), as well as within wet-dry heath, and swamp forest communities. The main occurrences of this species are in the Wyong and Lake Macquarie LGA. Disjunct populations have also been found south of Karuah in the Port Stephens LGA and north of Karuah in the Great Lakes LGA.	<b>Low</b> Marginal habitat was present.
<i>Callistemon linearifolius</i> Netted Bottle Brush	V			Grows in dry sclerophyll forest on the coast and adjacent ranges. From the Georges River to the Hawkesbury River in the Sydney area, and north to Nelson Bay. Known to occur within the nearby Stony Ridge Reserve on Soldiers Point.	<b>Located on site</b> Suitable habitat was present.
<i>Eucalyptus glaucina</i> Slaty Red Gum	V	V		The Slaty Red Gum principally occurs in the Casino area in northern NSW and from Gloucester to Broke, in mid-northern NSW. It grows mostly on gentle slopes near drainage lines in alluvial and clayey soils, in open forest.	<b>Low</b> Marginal habitat was present.



SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAIL		
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i> Drooping Red Gum	V	V		Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, <i>E. parramattensis</i> subsp. <i>decadens</i> is a characteristic species of 'Kurri Sand Swamp Woodland and in the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland'.	<b>Low</b> Marginal habitat was present
<i>Melaleuca biconvexa</i> Biconvex Paperbark	V	V		Only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Generally, grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	<b>Low</b> Suitable habitat was present.
<i>Melaleuca groveana</i> Grove's Paperbark	V			Widespread, scattered populations in coastal districts north of Yengo National Park to southeast Queensland. Grows in heath and shrubland, often in exposed sites, in low coastal hills, escarpment ranges and tablelands on outcropping granite, rhyolite and sandstone on rocky outcrops and cliffs. It also occurs in dry shrubby open forest and woodlands	<b>Unlikely</b> No suitable habitat was present.
<i>Rhodamnia rubescens</i> Scrub Turpentine	E4A		Yes	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	<b>Low</b> Suitable habitat was present.
<i>Syzygium paniculatum</i> Magenta Lilly Pilly	E1	V		Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	<b>Low</b> Marginal habitat was present
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> Small-flower Grevillea	V	V		Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest and is found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Common canopy species vary greatly with community type but generally are species that favour soils with a strong lateritic influence including <i>Eucalyptus fibrosa</i> , <i>E. parramattensis</i> , <i>Angophora bakeri</i> and <i>Eucalyptus sclerophylla</i> .	<b>Low</b> Suitable habitat was present.
<i>Cynanchum elegans</i> White-flowered Wax Plant	E1	E	No	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea level to about 600m ASL.	<b>Low</b> Suitable habitat was present.
<i>Persicaria elatior</i> Tall Knotweed	V	V	No	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson,	<b>Low</b> Suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
				Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	
<i>Chamaesyce psammogeton</i> Sand Spurge	E1			This prostrate perennial herb grows on foredunes and exposed sites on headlands.	<b>Unlikely</b> This species is unlikely to occur on site due to the lack of exposed foredune areas.
<i>Asperula asthenes</i> Trailing Woodruff	V	V		Occurs only in NSW. It is found in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area/Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR). Occurs in damp sites, often along river banks.	<b>Low</b> Marginal habitat was present. No known nearby records.
<i>Thesium australe</i> Austral Toadflax	V	V		Grows in grassland or woodland, often in damp sites.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA - INVERTEBRATES</b>					
<i>Synemon plana</i> Golden Sun Moth	E	CE		The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA - AMPHIBIANS</b>					
<i>Crinia tinnula</i> Wallum Froglet	V			Occurs along the coastal margin from Litabella National Park in south-east Queensland to Kurnell in Sydney. Found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedge lands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests.	<b>Low-Moderate</b> Suitable habitat was present within the area of swamp sclerophyll forest. Is known to occur within area.
<i>Litoria aurea</i> Green and Golden Bell Frog	E1	V		Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	<b>Low</b> Suitable habitat was present. No known nearby records.
<i>Litoria brevipalmata</i>	V			Open Forest, rainforest bordering cleared areas.	<b>Moderate</b>

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	BC Act 2016	EPB C Act 1999	SAIL		
Green-thighed Frog					Suitable habitat was present.
<i>Mixophyes balbus</i> Stuttering Frog	E1	V		Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	<b>Unlikely</b> No suitable habitat was present.
<i>Mixophyes iteratus</i> Giant Barred Frog	E1	E		Occurs on forest slopes of the Great Dividing Range, generally between 20-800m A.S.L. It appears to prefer riparian vegetation or other moist vegetation communities, generally on rich organic soils. Deep leaf litter and/or thick cover is necessary for this species. Water quality must be of a high standard, and the species occurs in 1st to 3rd order streams (i.e. 'young' streams), and is absent from ponds and ephemeral pools. Graded banks with undercuts and steep edges are favourable haunts of this frog.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA - BIRDS</b>					
<i>Limosa lapponica</i> Bar-tailed Godwit		M		Tidal mudflats, estuaries, sewerage ponds, shallow river margins, brackish or saline inland lakes and flooded pastures (Pizzey & Knight, 2001).	<b>Unlikely</b> No suitable habitat was present.
<i>Limosa lapponica menzbieri</i> Northern Siberian Bar-tailed Godwit		CE & M		Habitat utilised by this species includes tidal mudflats, river edges, sandy beaches, brackish swamps as well as the shallows of lakes, reservoirs and sewage farms.	<b>Unlikely</b> No suitable habitat was present.
<i>Limosa limosa</i> Black-tailed Godwit	V	M		Habitat utilised by this species includes tidal mudflats, river edges, sandy beaches, brackish swamps as well as the shallows of lakes, reservoirs and sewage farms.	<b>Unlikely</b> No suitable habitat was present.
<i>Actitis hypoleucos</i> Common Sandpiper		M		Shallow pebbly, muddy or sandy edges of rivers and streams, coastal and inland; dams, lakes, sewage ponds, margins of tidal rivers, waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches.	<b>Unlikely</b> No suitable habitat was present.
<i>Tringa nebularia</i> Common Greenshank		M		Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	<b>Unlikely</b> No suitable habitat was present.
<i>Tringa stagnatilis</i> Marsh Sandpiper		M		Salt; fresh, brackish or saline wetlands; sewage ponds, mangroves, tidal flats and estuaries.	<b>Unlikely</b> No suitable habitat was present.
<i>Xenus cinereus</i> Terek Sandpiper	V	M		Tidal Mudflats, estuaries, shores, reefs and coastal swamps.	<b>Unlikely</b> No suitable habitat was present.
<i>Arenaria interpres</i> Ruddy Turnstone		M		Tidal reefs and pools; weed-covered rocks; pebbly, shelly and sandy shores with stranded seaweed; mudflats; occasionally inland shallow waters; sewage ponds and open or ploughed ground.	<b>Unlikely</b> No suitable habitat was present.
<i>Heteroscelus brevipes</i> Grey-tailed Tattler		M		Estuaries, tidal mudflats, mangroves, wave-washed rocks, and reefs; shallow river margins, coastal and inland.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris acuminata</i>				Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland	<b>Unlikely</b>

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	BC Act 2016	EPB C Act 1999	SAIL		
Sharp-tailed Sandpiper		M		wetlands; sewage ponds and irrigated pastures.	<b>No suitable habitat was present.</b>
<i>Calidris alba</i> Sanderling	V	M		The species is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed. Sanderlings also occur on beaches that may contain wave-washed rocky outcrops. Less often the species occurs on more sheltered sandy shorelines of estuaries, inlets and harbours. Rarely, they are recorded in near-coastal wetlands, such as lagoons, hypersaline lakes, saltponds and samphire flats. They occur from Hastings Point, in the Tweed area, south to Shoalhaven Heads and Comerong Island. Sanderlings have been recorded further south, though rarely. Records are known from Jervis Bay, Moruya, Tuross Head and Brou Lake.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris canutus</i> Red Knot		M		Tidal mudflats, sandflats, beaches, saltmarshes, flooded pastures, ploughed lands.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris ferruginea</i> Curlew Sandpiper		M		Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris ruficollis</i> Red-necked Stint		M		Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris tenuirostris</i> Great Knot	V	M		Inhabits beaches, coastal mudflats, bay shores, estuarine environments; sometimes freshwater wetlands.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris ruficollis</i> Red-necked Stint		M		Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	<b>Unlikely</b> No suitable habitat was present.
<i>Numenius madagascariensis</i> Eastern Curlew		CE M		Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	<b>Unlikely</b> No suitable habitat was present.
<i>Numenius minutus</i> Little Curlew		M		Dry grasslands, floodplains, margins of drying swamps; tidal mudflats, crops and sewage ponds.	<b>Unlikely</b> No suitable habitat was present.
<i>Numenius phaeopus</i> Whimbrel		M		Whimbrels are found mainly on the coast, on tidal and estuarine mudflats, especially near mangroves. They are sometimes found on beaches and rocky shores. Whimbrels are common across northern Australia and uncommon to rare further south.	<b>Unlikely</b> No suitable habitat was present.
<i>Pachyptila turtur</i> <i>subantarctica</i> Fairy Prion		V		In Australia, breeding is recorded on two rock stacks off Macquarie Island and on the nearby Bishop and Clerk Island. The population may have been larger prior to the arrival of black rats on Macquarie Island. The subspecies digs burrows among rocks or low vegetation in which to nest. Burrows may be dug below mat forming herbs. Feeds by plucking food from the ocean surface.	<b>Unlikely</b> No suitable habitat was present.

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	BC Act 2016	EPB C Act 1999	SAIL		
<i>Charadrius bicinctus</i> Double-banded Plover		M		Wide beaches, tidal mudflats, saltmarsh, sparsely vegetated margins of shallow saline and freshwater.	<b>Unlikely</b> No suitable habitat was present.
<i>Charadrius leschenaultia</i> Greater Sand-plover	V	M		Inhabits sheltered bays, harbours and estuaries with large intertidal sandflats mudflats or bare paddocks.	<b>Unlikely</b> No suitable habitat was present.
<i>Charadrius mongolus</i> Lesser Sand-plover	V	M		Inhabits sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats.	<b>Unlikely</b> No suitable habitat was present.
<i>Pluvialis fulva</i> Pacific Golden Plover		M		Estuaries, tidal mudflats, saltmarshes, mangroves; rocky reefs, margins of shallow open inland swamps, sewage ponds.	<b>Unlikely</b> No suitable habitat was present.
<i>Pluvialis squatarola</i> Grey Plover		M		Mudflats, saltmarsh, tidal reefs and estuaries.	<b>Unlikely</b> No suitable habitat was present.
<i>Thinornis rubricollis</i> <i>rubricollis</i> Hooded Plover (eastern)	CE	V		Presently the Hooded Plover occurs in NSW north to Sussex Inlet. Occasionally, individual birds are sighted slightly further north to the Shoalhaven River and Comerong Beach and one bird was sighted at Lake Illawarra in March 2001. In south-eastern Australia Hooded Plovers prefer sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally Hooded Plovers are found on tidal bays and estuaries, rock platforms and rocky or sand-covered reefs near sandy beaches, and small beaches in lines of cliffs. They regularly use near-coastal saline and freshwater lakes and lagoons, often with saltmarsh.	<b>Unlikely</b> No suitable habitat was present.
<i>Gallinago hardwickii</i> Latham's Snipe		M		Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	<b>Low</b> Suitable habitat was present.
<i>Gallinago megala</i> Swinhoe's Snipe		M		Habitat specific to Australia includes the dense clumps of grass and rushes round the edges of fresh and brackish wetlands. This includes swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains pitted with crab holes	<b>Low</b> Suitable habitat was present.
<i>Gallinago stenura</i> Pin-tailed Snipe		M		During non-breeding period the Pin-tailed Snipe occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans in more arid parts of species' range.	<b>Unlikely</b> No suitable habitat was present.
<i>Rostratula australis</i> Australian Painted-snipe	E1	E		Margins of swamps and streams, chiefly those covered with low and stunted vegetation.	<b>Unlikely</b> No suitable habitat was present.



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<i>Botaurus poiciloptilus</i> Australasian Bittern	E1	E		The Australasian Bittern lives alone or in loose groups and favours permanent freshwaters dominated by sedges, rushes, reeds or cutting grasses (eg. Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia) and feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in rice fields.	<b>Low</b> Suitable habitat was present.
<i>Ixobrychus flavicollis</i> Black Bittern	V		No	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	<b>Low</b> Suitable habitat was present.
<i>Ephippiorhynchus asiaticus</i> Black-necked Stork	E1			Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Breeding has been recorded as far south as Tomago NSW.	<b>Unlikely</b> No suitable habitat was present.
<i>Burhinus grallarius</i> Bush Stone Curlew	E1			Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.	<b>Low</b> Marginal habitat was present.
<i>Esacus magnirostris</i> Beach Stone-curlew	E4a			Inhabits undisturbed sandy beaches, especially those with extensive mangrove-backed sandflats, mudflats or reefs exposed at low tide. It has also been recorded utilising cane fields that are located in proximity to tidal areas.	<b>Unlikely</b> No suitable habitat was present.
<i>Sternula nereis nereis</i> Australian Fairy Tern		V		The Fairy Tern (Australian) nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline	<b>Unlikely</b> No suitable habitat was present.
<i>Sternula albifrons</i> Little Tern	E1			Migrating from eastern Asia, the Little Tern is found on the north, east and south-east Australian coasts. Exclusively coastal, nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands.	<b>Unlikely</b> No suitable habitat was present.
<i>Ptilinopus magnificus</i> Wompoo Fruit-Dove	V			This frugivorous Rainforest specialist inhabits the canopy of Sub-tropical, Warm-temperate and Littoral Rainforests. Favoured feed trees include Figs, Laurels, Myrtles and native Tamarind. The females lay one egg on a flimsy platform of vine tendrils on a slender horizontal branch.	<b>Low</b> Secondary habitat was present.
<i>Calyptorhynchus lathamii</i> Glossy Black-Cockatoo	V			Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	<b>Recorded within the Study Area</b> Suitable foraging habitat was present.
<i>Lathamus discolor</i> Swift Parrot	E1	CE M		Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	<b>Low-Moderate</b> Seasonal foraging habitat was present.

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	BC Act 2016	EPB C Act 1999	SAIL		
<i>Glossopsitta pusilla</i> Little Lorikeet	V			Tall Open Forests, woodlands, orchards, parks and street trees.	<b>Recorded within the Study Area</b> Suitable habitat was present.
<i>Apus pacificus</i> Fork-tailed Swift		M		Inhabits the airspace over open country from semi deserts to coasts.	<b>Moderate</b> Due to the non-specific habitat requirements of this species habitat was considered to be present.
<i>Hirundapus caudacutus</i> White-throated Needletail		M		Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	<b>Moderate</b> Due to the non-specific habitat requirements of this species habitat was considered to be present.
<i>Monarcha melanopsis</i> Black-faced Monarch		M		Utilises a range of habitats including rainforests, eucalypt woodlands & coastal scrubs.	<b>Low</b> Due to the non-specific habitat requirements of this species habitat was considered to be present.
<i>Monarcha trivirgatus</i> Spectacled Monarch		M		Wet forests, thickly wooded gullies, waterside vegetation and mangroves.	<b>Low</b> Suitable habitat was present.
<i>Myiagra cyanoleuca</i> Satin Flycatcher		M		Heavily vegetated gullies in forests and taller woodlands. During migration this species also utilises coastal forests, woodlands, mangroves, remnant trees in paddocks and gardens.	<b>Moderate</b> Suitable habitat was present within the subject site.
<i>Rhipidura rufifrons</i> Rufous Fantail		M		Utilises a range of habitats including rainforests, wet sclerophyll forests, monsoon forests, scrubs, mangroves, watercourses, parks and gardens. During migration this species also utilises farms, street trees and buildings.	<b>Recorded within the Study Area</b> Transitory habitat was present.
<i>Artamus cyanopterus</i> c cyanopterus Dusky Woodswallow	V			The Dusky Woodswallow is found in open forests and woodlands, and may be seen along roadsides and on golf courses.	<b>Low</b> Suitable habitat was present.
<i>Cuculus optatus</i> Oriental Cuckoo		M		Inhabits a range of forests, typically feeding on insects and larvae.	<b>Low</b> Due to the non-specific habitat requirements of this species habitat was considered to be

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	BC Act 2016	EPB C Act 1999	SAIL		
					present.
<i>Anthochaera phrygia</i> Regent Honeyeater	E4A	CE M		Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	<b>Low</b> Seasonal foraging habitat was present.
<i>Daphoenositta chrysoptera</i> Varied Sittella	V			Open eucalypt woodland/forest, mallee, inland acacia, coastal tea-tree scrubs, golf courses, orchards and parks.	<b>Moderate</b> Suitable habitat was present.
<i>Grantiella picta</i> Painted Honeyeater	V			Nomadic, within a range of generally drier forested areas with mistletoes.	<b>Unlikely</b> No preferred habitat was present.
<i>Dasyornis brachypterus</i> Eastern Bristlebird	E1	E		Habitat is characterised by dense, low vegetation including heath and open woodland with a heathy understorey; in northern NSW occurs in open forest with tussocky grass understorey.	<b>Unlikely</b> Associated vegetation formation was not present. No local records.
<i>Hieraaetus morphnoides</i> Little Eagle	V			The Little Eagle occupies habitats rich in prey within open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used (Marchant and Higgins 1993; Aumann 2001a). For nest sites it requires a tall living tree within a remnant patch, where pairs build a large stick nest in winter and lay in early spring.	<b>Moderate</b> Suitable habitat was present.
<i>Pandion cristatus</i> Eastern Osprey	V			Found right around the Australian coast line. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes.	<b>Unlikely</b> Only marginal nesting habitat was present.
<i>Erythrotriorchis radiatus</i> Red Goshawk	E4A	E		The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.	<b>Low</b> Only marginal habitat was present.
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	V	M		Occupies habitat characterised by the presence of large areas of open water and feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans. The nests are built in a variety of sites including tall trees, bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or even in artificial structures.	<b>Recorded flying over the Study Area</b> Only suitable nesting habitat was present.
<i>Ninox connivens</i> Barking Owl	V			Is found in forest and woodland, encountered most commonly in savanna and paperbark woodlands. It sometimes roosts in rainforests, but it requires the more open country for hunting and hollow Eucalypts for breeding.	<b>Low</b> Suitable habitat was present.
<i>Ninox strenua</i> Powerful Owl	V			Inhabits a wide range of vegetation types from wet Eucalypt forests with a Rainforest understorey to Dry Open Forests and Woodlands. The species has been recorded utilising disturbed habitats such as exotic pine plantations and large trees in parks and	<b>Low - Moderate</b> Hunting and roosting habitat was present.

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	BC Act 2016	EPB C Act 1999	SAII		
				gardens. Powerful Owls nest in a slight depression in the wood-mould on the base of a cavity in a large old tree, sometimes in excess of 25 metres above the ground.	
<i>Tyto longimembris</i> Eastern Grass Owl	V			Recorded occasionally in all mainland states of Australia but are most common in northern and north-eastern Australia. Found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	<b>Unlikely</b> This species is unlikely to utilise the site.
<i>Tyto novaehollandiae</i> Masked Owl	V			A range of wooded habitats that contain mature trees with large hollows for roosting and nesting, and more open areas for hunting.	<b>Low</b> Only hunting habitat was present.
<i>Tyto tenebricosa</i> Sooty Owl	V			Prefers dense dimly-lit forests, inhabiting pockets of rainforest and wet sclerophyll forest mainly in mountainous areas, often in south-east facing gullies.	<b>Unlikely</b> Due to the lack of rainforest and tall wet sclerophyll forest the Sooty Owl would be considered unlikely to be present.
<b>FAUNA - MAMMALS</b>					
<i>Dasyurus maculatus</i> ssp. <i>maculatus</i> Spotted-tailed Quoll	V	V		Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	<b>Moderate</b> Suitable habitat was present.
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	E	V		Found in steep rocky sites in sclerophyll forests with a grassy understorey.	<b>Unlikely</b> This species is unlikely to utilise the site.
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	V			Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	<b>Moderate - High</b> Foraging and nesting habitat were present.
<i>Phascolarctos cinereus</i> Koala	V	V		Coastal woodland and open forest containing suitable food trees.	<b>Moderate</b> Preferred Koala feed tree species were present.
<i>Potorous tridactylus</i> sp. <i>tridactylus</i> Long-nosed Potoroo	V	V		This species is known from a variety of habitats, including Rainforest, Open Forests and Woodlands with dense groundcover, and dense, wet coastal heathlands. Soft (often sandy) substrates are preferred by this species.	<b>Low</b> Suitable habitat was present.
<i>Petaurus australis</i> Yellow-bellied Glider	V			Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Is found along the eastern coast to the western	<b>Low - Moderate</b> Suitable habitat was present.

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	BC Act 2016	EPB C Act 1999	SAIL		
				slopes of the Great Dividing Range, from southern Queensland to Victoria.	
<i>Petaurus norfolcensis</i> Squirrel Glider	V			Dry sclerophyll forests and woodlands with exudates for foraging and hollows for nesting.	<b>Recorded within the Study Area</b> Foraging and nesting habitat was present.
<i>Petauroides volans</i> Greater Glider		V		Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	<b>Low</b> Suitable habitat was present.
<i>Cercartetus nanus</i> Eastern Pygmy-possum	V			Feeds mostly on the pollen and nectar from banksias, eucalypts and understorey plants and will also eat insects, seeds and fruit. Hollow bearing trees are favoured for shelter and nesting although spherical nests constructed of short shredded bark have been found between the wood and bark of eucalypts. This species has been recorded north of Fern Bay within Coastal Sand Blackbutt Forest (Umwelt, 2004).	<b>Low</b> Suitable habitat was present.
<i>Pseudomys gracilicaudatus</i> Eastern Chestnut Mouse	V			Found in heathland, wet heathland and swamps.	<b>Low</b> Suitable habitat was present.
<i>Psuedomys novaehollandiae</i> New Holland Mouse		V		Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	<b>Low</b> Marginal habitat was present within the area of dry sclerophyll forest.
<i>Pteropus poliocephalus</i> Grey-headed Flying-Fox	V	V		Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	<b>High</b> Seasonal foraging habitat was available in the form of flowering myrtaceous canopy species.
<i>Micronomus norfolkensis</i> Eastern Freetail-bat	V			Appears to live in sclerophyll forests and woodland. Roosts in tree hollows or under loose bark.	<b>Recorded within the Study Area</b> Suitable hunting and roosting habitat were available.
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	V			Inhabits sclerophyll forests and has been observed roosting in holes and hollow trunks of Eucalypts.	<b>Moderate</b> Suitable hunting and roosting habitat were available.
<i>Miniopterus australis</i> Little Bentwing-bat	V			Tropical rainforest to warm-temperate wet and dry sclerophyll forest; caves or similar structures for roosting.	<b>Recorded within the Study Area</b> Suitable hunting habitat was present. Preferred roosting habitat was absent.
<i>Miniopterus orianae oceanensis</i> Large Bentwing-bat	V			Wet and dry tall open forest, rainforest, monsoon forest, open woodland, paperbark forests and open grasslands, caves or similar structures for roosting. It occasionally uses tree hollows.	<b>Recorded within the Study Area</b> Suitable hunting habitat was present. Preferred roosting habitat was absent.



SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Myotis macropus</i> Southern Myotis	V			Various habitats of the coast and adjacent ranges with suitable waterbodies for hunting; caves or similar structures for roosting. It occasionally uses tree hollows.	<b>Recorded within the Study Area</b> Suitable waterbodies were present for hunting. Preferred roosting habitat in the form of caves was absent.
<i>Phoniscus papuensis</i> Golden-tipped Bat	V			Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. It is also recorded in tall open forest. This species roosts mainly in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests, also in tree hollows, dense foliage and epiphytes; located in rainforest gullies on small first and second-order streams. There is a paucity of local record of this species.	<b>Low</b> Marginal habitat was present.
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	V			Has been reported from a wide variety of habitats. Roosts in tree hollows, animal burrows, dry clay cracks, under rock slabs and in abandoned Sugar Glider nests.	<b>Low - Moderate</b> Suitable hunting and roosting habitat were present.
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat	V			Tree-lined creeks, woodland/clearing ecotones and rainforest creeks, roosting mainly in tree hollows.	<b>Recorded within the Study Area</b> Suitable foraging and roosting habitat were present.
<i>Vespadelus troughtoni</i> Eastern Cave Bat	V			The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	<b>Low</b> Foraging habitat was present. No preferred roosting habitat was available within the site.
<i>Chalinolobus dwyeri</i> Large Pied Bat	V	V		Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	<b>Low</b> Suitable foraging habitat was present. Preferred roosting habitat was absent.
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E2			Predominantly open habitats, including plains, grasslands, woodlands and scrubs, and may occur occasionally in forest.	<b>Low</b> Suitable habitat was present.
Koala, Hawks Nest and Tea Gardens population	E2	V		The population extends in the south-east to the Yacaaba Headland and in the south-west to the peninsula west of Winda Woppa. The population is limited in the west and north-west to the outskirts of the built-up area of Tea Gardens, including the	The study area is located outside the designated area of the population.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
				Shearwater Estate, where it is bounded by Toonang Drive. The population is limited in the north to an east-west line three kilometres north of the northern boundary of the Hawks Nest Golf Course, although occasional sightings have been made outside these boundaries. The population is bounded in the south and east by the ocean.	

## 5.4 FAUNA APPRASIAL RESULTS

### 5.4.1 SMALL TERRESTRIAL MAMMAL TRAPPING

During this component of the survey two species of mammal, *Antechinus stuartii* (Brown Antechinus) and the introduced *Rattus rattus* (Black Rat) were captured. The results of the small terrestrial mammal survey are shown in Table 5.7.

Neither of these species are listed as threatened under State or National legislation.

**Table 5.7: Small Terrestrial Mammal Trapping Results.**

DATE	TRAP NO	SPECIES	SEX
Trapping period 16 March – 20 March 2020			
Tuesday 16/03/2020	T25	<i>Antechinus stuartii</i> (Brown Antechinus)	Male
Wednesday 17/03/2020	T32	<i>A. stuartii</i>	Male
Thursday 18/03/2020	T6 T17	* <i>Rattus rattus</i> (Black Rat) <i>A. stuartii</i>	Unknown Male
Friday 19/03/2020	T17 T20 T37	<i>A. stuartii</i> <i>A. stuartii</i> <i>A. stuartii</i>	Female Male Male

### 5.4.2 MEDIUM TERRESTRIAL MAMMAL TRAPPING

During this component of the survey one vertebrate species *Varanus varius* (Lace Monitor) was captured in C2 on Friday 19/03/2020. This species is not listed as threatened under State or National legislation.

### 5.4.3 ARBOREAL MAMMAL TRAPPING

During this component of the survey two species of mammal, *Petaurus norfolcensis* (Squirrel Glider) and *Antechinus stuartii* (Brown Antechinus) were captured. The results of the small terrestrial mammal survey are shown in Table 5.8.

*Petaurus norfolcensis* (Squirrel Glider) is listed as threatened under State legislation and has been assessed further in Section 7 and Appendix A of this report. The location of *P. norfolcensis* within the site is shown in Figure 4.2.

**Table 5.8: Arboreal Mammal Trapping Results.**

DATE	TRAP NO	SPECIES	SEX
Trapping period 16 March – 20 March 2020			
Tuesday 16/03/2020		No captures	
Wednesday 17/03/2020		No captures	
Thursday 18/03/2020	A3 A6	<i>A. stuartii</i> <i>A. stuartii</i>	Female
Friday 19/03/2020	A16	<i>Petaurus norfolcensis</i> (Squirrel Glider)	Female

#### 5.4.4 MICROCHIROPTERAN BAT CALL DETECTION

Seven species of microchiropteran bat, *Austronomus australis* (White-striped Freetail Bat), *Micronomus norfolkensis* (Eastern Freetail Bat), *Chalinolobus gouldii* (Gould's Wattled Bat), *Miniopterus australis* (Little Bentwing-bat), *Miniopterus orianae oceanensis* (Large Bentwing-bat), *Myotis macropus* (Large-footed Myotis) and *Scoteanax rueppellii* (Greater Broad-nosed Bat) were recorded within the site. Calls attributed to the Genus *Vespadelus* were consistent with *Vespadelus vulturnus* (Little Forest Bat). A number of calls attributed to the Genus *Nyctophilus* were likely to be either *N. geoffroyi* (Lesser Long-eared Bat) or *N. gouldi* (Gould's Long-eared Bat) were also recorded.

Five of these microchiropteran bat species; *M. norfolkensis*, *M. australis*, *M. orianae oceanensis*, *M. macropus* and *S. rueppellii* are listed as threatened species therefore have been further addressed in Section 7 and Appendix A of this report.

#### 5.4.5 AMPHIBIAN SURVEY

A number of amphibian species were recorded within the study area during surveys. Common species recorded included *Crinia signifera* (Common Eastern Froglet), *Litoria fallax* (Eastern Dwarf Tree Frog) and *Limnodynastes peronii* (Striped Marsh Frog). The list of amphibian species recorded on site is located in Appendix C.

None of these amphibian species are listed as threatened according to State or National legislation.

#### 5.4.6 REPTILE SURVEY

Four species of reptile, *Intellagama lesueurii lesueurii* (Eastern Water Dragon), *Varanus varius* (Lace Monitor), *Dendrelaphis punctulata* (Green Tree Snake) and *Lampropholis delicata* (Grass Skink), were recorded as a result of the reptile survey and incidental observations.

None of these reptile species are listed as threatened according to State or National legislation.

#### 5.4.7 AVIFAUNA SURVEY

An array of avifauna species was found to be present within the study area. Common Species recorded included *Rhipidura fuliginosa* (Grey Fantail), *Malurus cyaneus* (Superb Fairy-wren), *Lichenostomus chrysops* (Yellow-faced Honeyeater), *Philemon corniculatus* (Noisy Miner), *Cracticus tibicen* (Australian Magpie); *Cracticus nigrogularis* (Pied Butcherbird), *Dacelo novaeguineae* (Laughing Kookaburra), *Trichoglossus haematodus* (Rainbow Lorikeet), *Cormobates leucophaea* (White-throated Treecreeper), *Platycercus eximius* (Eastern Rosella) and *Acanthiza pusilla* (Brown Thornbill). The list of avifauna species recorded within the site is located within Appendix C.

Three threatened species, *Glossopsitta pusilla* (Little Lorikeet), *Haliaeetus leucogaster* (White-bellied Sea-Eagle) and *Calyptorhynchus lathami* (Glossy Black-Cockatoo) were observed within the study area. These avifauna species have been further addressed in Section 7 and Appendix A of this report.

#### 5.4.8 NOCTURNAL AVIFAUNA AND MAMMAL CALL PLAYBACK SURVEY

There were no responses as a result of the nocturnal avifauna and mammal call playback.

#### 5.4.9 SPOTLIGHTING SURVEY

Two native vertebrate species; *Trichosurus vulpecula* (Common Brushtail Possum) and *Podargus strigoides* (Tawny Frogmouth) were observed within the study area during the spotlighting surveys. The introduced *Oryctolagus cuniculus* (European Rabbit) was also observed within the site during spotlighting surveys.

These species are not listed as threatened under State or National legislation, however the European Rabbit is listed as a Key Threatening Process under State legislation and has been addressed further in Section 7 of this report.

#### 5.4.10 CAMERA TRAPPING

Four fauna species were positively identified within the study area during camera trapping conducted between March and April 2020. Fauna species were the native *Macropus rufogriseus* (Red-necked Wallaby) and the introduced *Cervus elaphus* (Red Deer), *Vulpes vulpes* (Red Fox) and *Lepus capensis* (European Hare)

None of the species recorded on camera are listed as threatened under State or National legislation, however Deer and Fox are listed as a Key Threatening Process under State legislation and have been addressed further in Section 7 of this report.

### 5.5 SURVEY LIMITATIONS

As with all reports of this type the main survey limitation is considered to be the very short period of time in which the fieldwork was carried out. Limitations to the likelihood of detecting certain subject species were also encountered during this survey. Such limitations were generally related to the seasonal occurrence of species, be it as a result of known flowering periods for flora or migratory movements by fauna. The cooler temperatures experienced at the time of survey would limit the likelihood of detection some species such as amphibians, reptiles and microchiropteran bats. Motor vehicle traffic noise also limited the detection of calling species such as amphibians and avifauna species.

These limitations have been overcome by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. This precautionary principle was achieved by recognising that most threatened species are rare and therefore unlikely to be encountered during a survey even if they may utilise the site at other times. These species have been assessed on the basis of the presence of their habitat and the likely significance of that habitat to a viable local population.



## **6.0 IMPACT ASSESSMENT**

The following sections provide an analysis of the potential impact the proposal may have on the biodiversity values within the site and provide recommendations of compensatory and ameliorative measures that should be undertaken.

### **6.1 AVOIDANCE AND MINIMISATION OF IMPACTS**

A portion of the proposal (dwelling addition) has been positioned on maintained exotic groundcovers, however areas of native vegetation will require removal.

### **6.2 DIRECT IMPACT**

The proposal will result in the following direct and potential impacts/losses:

- The removal of 0.33ha of PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion
- Modification of 0.08ha of PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion for a Bushfire APZ;
- The removal of 0.04ha of PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands:
- Modification of 0.04ha of PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands for a Bushfire APZ;
- Up to 0.49ha of Highly Suitable Koala Habitat;
- Up to 0.49ha of suitable habitat for a number of threatened species.
- Injury/Mortality to native fauna during felling of trees.

### **6.3 INDIRECT IMPACTS**

The proposal may result in the following indirect and potential impacts:

- Erosion and sedimentation;
- Increased runoff of water that is high in tannins
- Increased spread of noxious and other weeds;
- Edge effects.

#### 6.4 MITIGATION MEASURES

A number of mitigation measures have been specified to minimise the impact of the loss of habitat and protection of the outside environment. The measures will include:

- Protection of retained habitat/vegetation;
- Protection of fauna during vegetation removal;
- Retention of Habitat Values
- Erosion Control;
- Branch trimming wherever possible to avoid removal of trees;
- Compensatory Plantings;

##### Protection of retained habitat/vegetation before and after construction

- Clearly define the extent of the construction boundary on the ground to prevent any unintended incursions by the use of a barrier fence etc;
- Carry out erosion & sediment control around the fill and construction area prior to any works;
- Clearly mark individual trees which are required to be removed:
- All trees are to be inspected on the morning of their removal for Koalas;

## 7.0 CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

Considerations of the effects of the vegetation removal undertaken for the proposed development under Section 7.3 of the BC Act (2016) for the concerned threatened species is given below. The species dealt with are those identified during the fieldwork and those identified as having potential habitat available on site in Table 4.3.

*For the purposes of the Section 7.3 of the BC Act (2016), the following factors have been taken into account in deciding whether there is likely to be a significant effect on this threatened species, populations or ecological communities, or their habitats:*

- a) *in the case of a threatened species, whether the proposed development or activity 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.*

### Threatened Flora

One threatened flora species, *Callistemon linearifolius* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Specimens of *C. linearifolius* will not be directly impacted by the proposal. It will be important that the Bushfire APZ be clearly defined on the ground to prevent any disturbance to these shrubs.

Sixteen additional threatened flora species were also considered to have potential habitat within the study area as a result of the presence of suitable habitat and database searches. These flora species were:

- *Cryptostylis hunteriana* (Leafless Tongue-orchid).
- *Corybas dowlingii* (Red Helmet Orchid);
- *Diuris praecox* (Newcastle Doubletail);
- *Diuris arenaria* (Tomaree Doubletail)
- *Pterostylis chaetophora* (Tall Rustyhood);
- *Tetraloche juncea* (Black-eyed Susan)
- *Angophora inopina* (Charmhaven Apple);
- *Rhodamnia rubescens* (Scrub Turpentine);
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum);
- *Syzygium paniculatum* (Magenta Lilly Pilly)
- *Melaleuca biconvexa* (Biconvex Paperbark)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea);
- *Cynanchum elegans* (White-flowered Wax Plant);
- *Persicaria elatior* (Tall Knotweed);
- *Asperula asthenes* (Trailing Woodruff);
- *Eucalyptus glaucina* (Slaty Red Gum).

Of these listed species the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetraloche juncea* (Black-eyed Susan). The proposal will result in an incremental reduction of marginal habitat for these threatened flora species in the locality, however it is not likely to have a significant impact on any of the above listed flora species on site such that a local population would be placed at risk of extinction.

### Threatened Fauna

A total of nine threatened fauna species were recorded within the study area during fieldwork:

- |   |                         |
|---|-------------------------|
| • <i>Glossopsitta pusilla</i>           | Little Lorikeet         |
| • <i>Calyptorhynchus lathamii</i>       | Glossy Black-Cockatoo   |
| • <i>Haliaeetus leucogaster</i>         | White-bellied Sea Eagle |
| • <i>Petaurus norfolcensis</i>          | Squirrel Glider         |
| • <i>Micronomus norfolkensis</i>        | Eastern Freetail-bat    |
| • <i>Miniopterus australis</i>          | Little Bentwing-bat     |
| • <i>Miniopterus orianae oceanensis</i> | Eastern Freetail Bat    |
| • <i>Myotis macropus</i>                | Large-footed Myotis     |
| • <i>Scoteanax rueppellii</i>           | Greater Broad-nosed Bat |

All nine species have been assessed in Appendix A of this report. The assessment found the proposal will result in a small incremental reduction of habitat for these species however is unlikely to disrupt the life cycle of these species such that local extinction would occur.

No other additional threatened species were recorded during fieldwork. Of the 53 addressed threatened fauna species the subject site was considered to contain suitable habitat for 30 species:

- |   |                               |
|---|-------------------------------|
| • <i>Crinia tinnula</i>                       | Wallum Froglet                |
| • <i>Litoria aurea</i>                        | Green and Golden Bell Frog    |
| • <i>Litoria brevipalmata</i>                 | Green-thighed Frog            |
| • <i>Botaurus poiciloptilus</i>               | Australasian Bittern          |
| • <i>Ixobrychus flavicollis</i>               | Black Bittern                 |
| • <i>Burhinus grallarius</i>                  | Bush Stone Curlew             |
| • <i>Ptilinopus magnificus</i>                | Wompoo Fruit-Dove             |
| • <i>Lathamus discolor</i>                    | Swift Parrot                  |
| • <i>Artamus cyanopterus cyanopterus</i>      | Dusky Woodswallow             |
| • <i>Anthochaera phrygia</i>                  | Regent Honeyeater             |
| • <i>Daphoenositta chrysoptera</i>            | Varied Sittella               |
| • <i>Hieraaetus morphnoides</i>               | Little Eagle                  |
| • <i>Erythrorhynchus radiatus</i>             | Red Goshawk                   |
| • <i>Ninox connivens</i>                      | Barking Owl                   |
| • <i>Ninox strenua</i>                        | Powerful Owl                  |
| • <i>Tyto novaehollandiae</i>                 | Masked Owl                    |
| • <i>Dasyurus maculatus ssp. maculatus</i>    | Spotted-tailed Quoll          |
| • <i>Phascogale tapoatafa</i>                 | Brush-tailed Phascogale       |
| • <i>Phascogale cinerea</i>                   | Koala                         |
| • <i>Potorous tridactylus sp. tridactylus</i> | Long-nosed Potoroo            |
| • <i>Petaurus australis</i>                   | Yellow-bellied Glider         |
| • <i>Cercartetus nanus</i>                    | Eastern Pygmy-possum          |
| • <i>Pseudomys gracilicaudatus</i>            | Eastern Chestnut Mouse        |
| • <i>Pseudomys novaehollandiae</i>            | New Holland Mouse             |
| • <i>Pteropus poliocephalus</i>               | Grey-headed Flying-Fox        |
| • <i>Falsistrellus tasmaniensis</i>           | Eastern False Pipistrelle     |
| • <i>Phoniscus papuensis</i>                  | Golden-tipped Bat             |
| • <i>Saccolaimus flaviventris</i>             | Yellow-bellied Sheathtail-bat |
| • <i>Vespadelus troughtoni</i>                | Eastern Cave Bat              |
| • <i>Chalinolobus dwyeri</i>                  | Large Pied Bat                |

Of these remaining threatened fauna species those most likely to utilise the site would include a number of the woodland birds, Grey-headed Flying-Fox and microchiropteran bats. The proposal will result in a

small incremental reduction habitat for the above species. Given the small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

The area of Swamp Forest within the subject site and study area was found to be consistent with the Endangered Ecological Community EEC; Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions. The proposal will allow the removal of up to 0.06ha of this TEC including 11 trees. A number of recommendations have been given for the protection of this EEC over the remainder of the site. The proposal will result in an incremental reduction of this community; however, it is unlikely to substantially impact or adversely modify the composition or extent of this TEC such that its local occurrence will be placed at risk of extinction.

c) *In relation to the habitat of a threatened species or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
- (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*
- (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 will result in the following direct and potential impacts/losses:

- Up to 0.06ha of Swamp Mahogany - Broad-leaved Paperbark - Swamp Water Fern - Plume Rush swamp forest on coastal lowlands of the Central Coast and Lower North Coast (PCT 1725);
- Up to 0.06ha of Endangered Ecological Community - Swamp Sclerophyll Forest.
- Up to 0.06ha of Preferred Koala Habitat (note: no specimens of preferred Koala Feed Tree species are required to be removed or occur within the site).
- Removal of up to 11 trees; 6 *Eucalyptus robusta* (Swamp Mahogany), 1 *Melaleuca quinquenervia* (Broad-leaved Paperbark), 1 *Eucalyptus pilularis* (Blackbutt), 1 Dead Tree, 1



*Angophora costata* (Smooth-barked Apple) & 1 *Schefflera actinophylla* (Umbrella Tree) (Table 6.1, Figure 6.1 & Appendix B);

- Injury/Mortality to native fauna during felling of trees.

Native vegetation occurring within the site would form part of a north-south and east-west corridor for native fauna species such as the Koala. The proposal will result in an incremental reduction of the integrity of the corridor however it is not considered to be a significant impact.

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 areas of outstanding biodiversity value are within the site.

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table 7.1.

**Table 7.1: Key Threatening Processes.**

<b>Key Threatening Process</b>	<b>Applicability in regards to the site</b>
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees are required to be removed.
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Pennisetum clandestinum</i> (Kikuyu) were recorded within the site. The proposal is unlikely to increase the impacts associated with these grass species.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the site. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the site.

## **8.0 ASSESSMENT OF OTHER BIODIVERSITY LEGISLATION**

### **8.1 CONSIDERATIONS UNDER THE STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2019**

The principal aim of State Environment Planning Policy (Koala Habitat Protection) 2019 (SEPP Koala Habitat Protection), is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This Policy applies to each local government area listed in Schedule 1, of which Dungog Shire Council is listed.

Seven key planning principles have been developed to help define the criteria and requirements set out in the SEPP Koala Habitat Protection Guideline. They are:

1. Understand and identify koala habitat values including landscape connectivity (such as habitat extent and habitat linking areas).
2. Avoid inappropriate land uses or intensifying land uses in koala habitat areas through appropriate landscape planning and site selection.
3. Encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas.
4. Minimise potential impacts to koalas and their habitat through design that avoids fragmentation or direct loss of koala habitat, and maintains the function of the koala habitat.
5. Implement best practice measures to manage identified threats to koalas and their habitat (such as those listed in Part 3).
6. Use compensatory (i.e., offsetting) measures only where they can be shown to meet the aim of the SEPP.
7. Use adaptive management strategies to monitor, evaluate and deliver appropriate planning outcomes for koalas in their local setting

#### **8.1.2 HOW DOES THE SEPP KOALA HABITAT PROTECTION APPLY TO THIS PROPOSAL**

The site is located within a Schedule 1 council, Mid Coast Council and is larger than 1ha. The site was therefore assessed on the Koala Development Application Map, which mapped the site as containing suitable koala habitat. The site is considered to be in the North Coast Koala Management Area. A total of 13 Schedule 2 Koala Food Trees associated with this region were located within the site. Species included *Allocasuarina torulosa* (Forest Oak), *Angophora floribunda* (Rough-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Corymbia maculata* (Spotted Red Gum), *Eucalyptus fibrosa* (Broad-leaved Red Ironbark), *Eucalyptus globoidea* (White Stringybark), *Eucalyptus moluccana* (Grey Box), *Eucalyptus propinqua* (Small-fruited Grey Gum), *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus siderophloia* (Grey Ironbark), and *Eucalyptus tereticornis* (Forest Red Gum), *Melaleuca quinquenervia* (Broad-leaved Paperbark).

Mid Coast Council does not have a current Koala Plan of Management (KPoM) and is therefore required to be assessed under the Development Assessment Process.

### **8.1.3 DEVELOPMENT ASSESSMENT PROCESS UNDER PART 3**

#### **8.1.3.1 Tier 1 - Low or no direct impact development**

The Tier 1 process is for development which can be demonstrated to have low or no direct impact on koalas or koala habitat as follows:

1. indirect impacts that will not result in clearing of native vegetation within koala habitat
2. the development is below the Biodiversity Offsets Scheme threshold under the BC Act
3. there is no native vegetation removal
4. the development footprint will not impede movement between koala habitat
5. adequate mitigation measures such as those listed in Table 1 below are implemented as necessary

The proposal does not meet all criteria under Tier 1 of the Development Assessment Process.

#### **8.1.3.2 Tier 2 - Development Applications impacting koalas and/or koala habitat**

Under Tier 2 a Koala Assessment Report has been completed within Appendix D of this report for the proposal.

## 9.0 CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Assessments have been made to determine whether or not the proposal or activity has, will have, or is likely to have a significant impact on a matter of National Environmental Significance. The matters of National Environmental Significance and the appropriate responses are listed below:

- *World Heritage properties;*

The site is not likely to have a significant impact to any World Heritage Properties.

- *wetlands recognised under the Ramsar convention as having international significance;*

The site is within 6km north of Myall Lakes Ramsar area located at Tea Gardens. It is unlikely the proposal will have a significant impact on this Ramsar wetland.

- *listed threatened species and communities;*

Three nationally threatened ecological communities were recorded on the DAWE database as having potential to occur within 10km of the site, these being:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community;
- Lowland Rainforest of Subtropical Australia;
- Subtropical and Temperate Coastal Saltmarsh

The ecological communities located within the site were not consistent with any nationally listed threatened ecological communities.

Forty-five nationally threatened species were recorded on the DAWE database as occurring or having potential habitat available within 10km of the site (note all pelagic species and ocean-going birds which do not complete part of their life cycles on mainland NSW were excluded from the search), these being:

- *Arthraxon hispidus* (Hairy-joint Grass)
- *Cryptostylis hunteriana* (Leafless Tongue Orchid)
- *Diuris praecox* (Newcastle Doubletail)
- *Phaius australis* (Lesser Swamp-orchid)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)
- *Angophora inopina* (Charmhaven Apple)
- *Eucalyptus glaucina* (Slaty Red Gum)
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)
- *Melaleuca biconvexa* (Biconvex Paperbark)
- *Syzygium paniculatum* (Magenta Lillypilly)
- *Tetradlea juncea* (Black-eyed Susan)
- *Cynanchum elegans* (White-flowered Wax Plant)
- *Prostanthera densa* (Villous Mintbush)



- *Asperula asthenes* (Trailing Woodruff)
- *Persicaria elatior* (Tall Knotweed)
- *Thesium australe* (Austral Toadflax)
- *Synemon plana* (Golden Sun Moth)
- *Litoria aurea* (Green and Golden Bell Frog)
- *Mixophyes balbus* (Stuttering Frog)
- *Mixophyes iteratus* (Giant Barred Frog)
- *Limosa lapponica baueri* (Bar-tailed Godwit)
- *Limosa lapponica menzbieri* (Northern Siberian Bar-tailed Godwit)
- *Calidris canutus* (Red Knot)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris tenuirostris* (Great Knot)
- *Numenius madagascariensis* (Eastern Curlew)
- *Charadrius mongolus* (Lesser Sand-plover)
- *Thinornis rubricollis rubricollis* (Hooded Plover)
- *Rostratula benghalensis australis* (Australian Painted Snipe)
- *Sternula nereis nereis* (Australian Fairy Tern)
- *Botaurus poiciloptilus* (Australasian Bittern)
- *Lathamus discolor* (Swift Parrot)
- *Hirundapus caudacutus* (White-throated Needletail)
- *Anthochaera phrygia* (Regent Honeyeater)
- *Grantiella picta* (Painted Honeyeater)
- *Dasyornis brachypterus* (Eastern Bristlebird)
- *Erythrorhynchus radiatus* (Red Goshawk)
- *Dasyurus maculatus maculatus* (Spotted-tailed Quoll)
- *Petrogale penicillata* (Brush-tailed Rock-wallaby)
- *Phascogale cinereus* (Koala)
- *Potorous tridactylus tridactylus* (Long-nosed Potoroo)
- *Petauroides volans* (Greater Glider)
- *Pseudomys novaehollandiae* (New Holland Mouse)
- *Pteropus poliocephalus* (Grey-headed Flying Fox)
- *Chalinolobus dwyeri* (Large Pied Bat)

With consideration to the EPBC Act Referral Guidelines for the Vulnerable Koala (DoE, 2014) the proposal will be under the 2ha removal threshold. The proposal will result in an incremental reduction of Highly Suitable Koala habitat within the local area however the action is not likely to result in significant impact at a national level and therefore no referral should be required.

No other nationally threatened species were recorded on site during the survey. Given the recommendations in Section 6.0 the proposal would not likely result in the modification or loss of any suitable habitat that would significantly affect the life cycle of any of the remaining fauna species or place any viable local populations of these species at risk of extinction.

- *migratory species protected under international agreements;*

Thirty-three nationally listed migratory species were recorded on the DoEE on-line database as occurring or having potential habitat available within 10km of the subject site, these being:

Migratory Terrestrial Species:

- *Cuculus optatus* (Oriental Cuckoo)

- *Hirundapus caudacutus* (White-throated Needletail)
- *Monarcha melanopsis* (Black-faced Monarch)
- *Monarcha trivirgatus* (Spectacled Monarch)
- *Myiagra cyanoleuca* (Satin Flycatcher)
- *Rhipidura rufifrons* (Rufous Fantail)

Migratory Wetland Species:

- *Actitis hypoleucos* (Common Sandpiper)
- *Arenaria interpres* (Ruddy Turnstone)
- *Calidris acuminata* (Sharp-tailed Sandpiper)
- *Calidris canutus* (Red Knot)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris melanotos* (Pectoral Sandpiper)
- *Calidris ruficollis* (Red-necked Stint)
- *Calidris tenuirostris* (Great Knot)
- *Charadrius bicinctus* (Double-banded Plover)
- *Charadrius mongolus* (Lesser Sand Plover)
- *Gallinago hardwickii* (Latham's Snipe)
- *Gallinago megala* (Swinhoe's Snipe)
- *Gallinago stenura* (Pin-tailed Snipe)
- *Limosa lapponica* (Bar-tailed Godwit)
- *Limosa limosa* (Black-tailed Godwit)
- *Numenius madagascariensis* (Eastern Curlew)
- *Numenius minutus* (Little Curlew)
- *Numenius phaeopus* (Whimbrel)
- *Pandion haliaetus* (Osprey)
- *Pluvialis fulva* (Pacific Golden Plover)
- *Pluvialis squatarola* (Grey Plover)
- *Tringa brevipes* (Grey-tailed Tattler)
- *Tringa nebularia* (Common Greenshank)
- *Tringa stagnatilis* (Marsh Sandpiper)
- *Xenus cinereus* (Terek Sandpiper)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)
- *Sternula albifrons* (Little Tern)

Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

- *nuclear activities;*

The proposal does not involve any type of nuclear activity.

- *the Commonwealth marine environment;*

The proposal does not involve the modification of the Commonwealth marine environment.

## 10.0 CONCLUSION

Flora, fauna and habitat studies have been undertaken for a proposed extension to the existing Australian Native Landscapes facility at Lot 1 DP 714149 Pindimar Road, Tea Gardens NSW.

The action involves extensions to the existing Australian Native Landscapes facility, including packing sheds, workshop extension, wood waste processing building, silt trap, storage tanks, dam extension and associated works. The footprint of the proposal will result in the removal of up to 0.37ha and modification of up to 0.12ha of native vegetation.

PCTs present within the site include:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion;
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands;
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast.
- Highly Disturbed Vegetation;
- Aquatic Dam Vegetation.

The area of Swamp Forest within the subject site was found to be consistent with the Endangered Ecological Community EEC; Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner Bioregions. This TEC will not be directly impacted as a result of the proposal.

One threatened flora species, *Callistemon linearifolious* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Specimens of *C. linearifolious* will not be directly impacted by the proposal. It will be important that the Bushfire APZ be clearly defined on the ground to prevent any disturbance to these shrubs.

Of the additional 16 flora species assessed, the most likely to occur within the study area would be *Pterostylis chaetophora* (Tall Rustyhood) and *Tetradlea juncea* (Black-eyed Susan). The proposal will result in an incremental reduction of marginal habitat for these threatened flora species in the locality, however it is not likely to have a significant impact on any of the above listed flora species on site such that a local population would be placed at risk of extinction.

A total of nine threatened fauna species were recorded within the site as a result of fieldwork:

- *Glossopsitta pusilla* (Little Lorikeet)

- *Calyptorhynchus lathamii* (Glossy Black-Cockatoo)
- *Haliaeetus leucogaster* (White-bellied Sea Eagle)
- *Petaurus norfolcensis* (Squirrel Glider)
- *Micronomus norfolkensis* (Eastern Freetail-bat)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Eastern Freetail Bat)
- *Myotis macropus* (Large-footed Myotis)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

The assessment found the proposal will result in a small incremental reduction of habitat for these nine species however is unlikely to disrupt the life cycle of these species such that local extinction would occur.

Of the 53 remaining addressed threatened fauna species the site was considered to contain suitable habitat for 30 species. Of these remaining threatened fauna species those most likely to utilise the site would include a number of the woodland birds, Grey-headed Flying-Fox and microchiropteran bats. The proposal will result in a small incremental reduction habitat for these species, however given the relatively small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

Investigations in accordance with State Environmental Planning Policy (Koala Habitat Protection) 2019 revealed that although the site did not contain any evidence of recent koala activity, the site contained a total of 13 Schedule 2 Koala Food Tree species which totalled greater than 15% with each PCT impacted by the development. Additionally, a total of six records of koala within 2.5km of the site over the past 18 years (DPIE, 2020). The site was therefore considered to contain 'Highly Suitable Koala Habitat'. The proposal will result in the loss or modification of approximately 0.49ha of highly suitable koala habitat. Provided the recommendations listed in this report are implemented the proposal is unlikely to have a significant impact on the Koala population such that a viable local population would be placed at risk of extinction.

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act (1999). Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

In conclusion, a number of recommendations have been given to reduce the impact of the proposal on threatened flora, fauna and communities. The proposal will result in an incremental reduction of habitat for a number of species, however is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

## 11.0 BIBLIOGRAPHY

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# **APPENDIX A**

## **CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016**

**CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016 - SIGNIFICANT EFFECT ON THREATENED SPECIES, POPULATIONS OR ECOLOGICAL COMMUNITIES, OR THEIR HABITATS**

Considerations of the effects of the vegetation removal undertaken for the proposed development under *Section 7.3* of the BC Act (2016) for threatened species located within the site is given below.

**Endangered ecological communities recorded within the study area:**

1. Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-east Corner bioregions

**Threatened species recorded within the study area:**

- |  |                         |
|--|-------------------------|
| 2. <i>Callistemon linearifolius</i>      | Netted Bottle Brush     |
| 3. <i>Glossopsitta pusilla</i>           | Little Lorikeet         |
| 4. <i>Calyptorhynchus lathami</i>        | Glossy Black-Cockatoo   |
| 5. <i>Haliaeetus leucogaster</i>         | White-bellied Sea Eagle |
| 6. <i>Petaurus norfolkensis</i>          | Squirrel Glider         |
| 7. <i>Micronomus norfolkensis</i>        | Eastern Freetail-bat    |
| 8. <i>Miniopterus australis</i>          | Little Bentwing-bat     |
| 9. <i>Miniopterus orianae oceanensis</i> | Eastern Freetail Bat    |
| 10. <i>Myotis macropus</i>               | Large-footed Myotis     |
| 11. <i>Scoteanax rueppellii</i>          | Greater Broad-nosed Bat |

## Endangered Ecological Communities recorded within the study area

### 1. Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.

#### Description

Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-east Corner bioregions is associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains (New South Wales Scientific Committee, 2004). The structure of the community is typically open forest, although partial clearing may have reduced the canopy to scattered trees. The most widespread and abundant dominant trees include *Eucalyptus robusta* (Swamp Mahogany) and *Melaleuca quinquenervia* (Broad-leaved Paperbark). South from Sydney *Eucalyptus botryoides* (Bangalay) and *Eucalyptus longifolia* (Woollybut) are common. Other common trees include *Eucalyptus resinifera* (Red Mahogany), *Livistona australis* (Cabbage Gum), *Callistemon salignus* (Willow Bottlebrush) and *Casuarina glauca* (Swamp Oak).

#### Conservation Status

Biodiversity Conservation Act 2016 – Listed as an Endangered Ecological Community  
Environmental Protection and Biodiversity Conservation Act 1999 – Not Listed.

#### Distribution

Found on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-east Corner bioregions.

#### Five Part Test of Significance

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a. *in the case of a threatened species, whether the proposed development or activity 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,*

NA

- b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
  - i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
  - ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Approximately 2.6ha of the state listed TEC Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions was present on the lower ground in the southern half of the study area. This TEC will not be directly impacted as a result of the proposal. It is important that strict sediment and tannin water controls be implemented to prevent any secondary impacts to this TEC. Taking the recommendations into consideration the proposal is unlikely to have an adverse effect on Swamp Sclerophyll Forest that its composition or local occurrence is likely to be placed at extinction.

- c. *in relation to the habitat of a threatened species or ecological community:*
- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - 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 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,*

No area of Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions is required to be directly impacted as a result of the proposal.

- 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),*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A1.

**Table A1: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

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**Threatened flora species recorded within the study area:**

**2. *Callistemon linearifolius***

**Netted Bottle Brush**

Description

This shrub is up to 3-4 m tall, with linear (long and narrow) to linear-lanceolate (lance shaped) leaves 8-10 cm long, and 5-7 mm wide with an sharp tip, thickened margins, and distinct lateral veins. The brushes (flowers) are red and usually 9-10 cm long and approximately 50 mm in diameter. The stem upon which the filaments occur are covered in a soft downy hair at flowering. The seed capsules are approximately 7 mm in diameter.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

Grows in dry sclerophyll forest on the coast and adjacent ranges. Flowers spring – summer.

Distribution

Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a. in the case of a threatened species, whether the proposed development or activity 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,*

One threatened flora species, *Callistemon linearifolious* (Netted Bottlebrush) was recorded within the study area, with seven specimens located adjacent to the drainage line to the south-east of the current development. Specimens of *C. linearifolious* will not be directly impacted by the proposal. It will be important that the proposed nearby Bushfire APZ be clearly defined on the ground to prevent any disturbance to these shrubs. The proposal will result in a small incremental reduction of habitat for *C. linearifolious* in the locality, however it is not likely to have a significant impact on any of the above listed flora species on site such that a local population would be placed at risk of extinction.

- b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
  - i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
  - ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

NA

- c. *in relation to the habitat of a threatened species or ecological community:*
- the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - 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 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,*

Whilst no specimens of *C. linearifolious* will be directly impacted, approximately 0.49ha of suitable habitat will be impacted. However, no important areas of habitat for *C. linearifolious* will be removed, modified, fragment or isolated.

- 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),*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A2.

**Table A2: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

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**Threatened fauna species recorded within the study area:**

**3. *Glossopsitta pusilla* Little Lorikeet**

Description

The Little Lorikeet is a small (16-19 cm; 40 g) bright green parrot, with a red face surrounding its black bill and extending to the eye.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not Listed.

Habitat Requirements and Ecology

This Lorikeet species occurs in forests, woodlands, large trees within open country, timbered watercourses, shelterbelts and street trees. Nests in a small hollow within a eucalypt.

Distribution

Distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a. in the case of a threatened species, whether the proposed development or activity 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,*

*Glossopsitta pusilla* (Little Lorikeet) was recorded within the study area during fieldwork. Suitable foraging and nesting habitat were present across the forested habitats of the study area. The proposal will require the removal/modification of 0.49ha of suitable foraging habitat. No potential nesting trees will require removal. The proposal is considered unlikely to result in the extinction of any local population of this mobile parrot species

- b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
  - i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
  - ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

NA

- c. in relation to the habitat of a threatened species or ecological community:*
  - i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - 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*
  - 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 will result in the removal of approximately 0.49ha of suitable foraging habitat. However, no important areas of habitat for the Little Lorikeet will be removed, modified, fragment or isolated.

- 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),*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A3.

**Table A3: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

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#### 4. *Calyptorhynchus lathamii* Glossy-Black Cockatoo

##### Description

The Glossy Black-cockatoo is a dusky brown to black cockatoo with a massive, bulbous bill and a broad, red band through the tail.

##### Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not Listed.

##### Habitat Requirements and Ecology

The Glossy Black-Cockatoo inhabits Wet and Dry Sclerophyll Forests and Woodlands. It prefers highland habitats in the northern part of its range but may be found closer to the coast when and where conditions are suitable. In the south they are widespread in lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses.

Glossy Black-Cockatoos forage primarily on the seeds of (*Allo*)*Casuarina* species, but will also take wood borers from large *Acacia* stems. *Allocasuarina torulosa*, *A. verticillata* and *A. littoralis* are the predominant food trees in N.S.W. On Kangaroo Island, *Casuarina stricta* is the predominant food source. They have also been observed eating *Angophora*, *Acacia* and *Eucalyptus* seeds. It now appears to supplement its diet with the seeds of exotic pine trees. A sign that foraging individuals have recently fed at a site is a scattering of leaves, twigs and freshly chewed cones under the (*Allo*)*Casuarina* trees. While feeding they are tame and relatively easy to approach. Flocks of Glossy Black-Cockatoos have been seen but are not common. They are usually seen in pairs or threes (being a pair and their young), or as feeding groups consisting of 10-12 birds that are likely to be loose family aggregations. Such groups seem to occupy an area permanently and have a distinctive flight pattern of slow, shallow wing-beats. Nesting takes place from March to August in the hollows of large Eucalypts, 10-20m above the ground, where a single egg is laid.

##### Distribution

The Glossy Black-Cockatoo inhabits Sclerophyll Forests and Woodlands of eastern Victoria to central Queensland, extending to the western slopes in New South Wales. A subspecies, *C. l. halmaturinus* exists on Kangaroo Island, South Australia.

##### Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:

- a) in the case of a threatened species, whether the proposed development or activity 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.

A small group of three specimens of Glossy Black Cockatoo were observed within the study area during fieldwork. The study area contained suitable foraging habitat for the Glossy Black Cockatoo in the form of *Allocasuarina torulosa* (Forest Oak) and *Allocasuarina littoralis* (Black Oak). No suitable large breeding hollows were recorded over the study area. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

NA

- b) *In relation to the habitat of a threatened species or ecological community:*
- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - (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*
  - (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 will result in the removal of approximately 0.49ha of suitable foraging habitat. However, no important areas of habitat for the Glossy Black Cockatoo will be removed, modified, fragment or isolated.

- c) *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).*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- d) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A4.

**Table A4: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

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Slater, P., Slater, P. & Slater, R. (1995). *The Slater Field Guide to Australian Birds*, Lansdowne Publishing Pty. Ltd., Sydney

**5. *Haliaeetus leucogaster* Sea Eagle**

Description

The White-bellied Sea Eagle is a large fishing raptor with large eagle that has long broad wings and a short, wedge-shaped tail. It measures 75–85 cm in length, and has a wingspan of 180–220 cm.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).

Distribution

The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Sea Eagle was observed flying over the study area during fieldwork on two occasions. No suitable hunting habitat in the form of large waterbodies was present within the study area. The study area may provide marginal nesting habitat however no large nests were also recorded.

- b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*  
(ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

- c) *In relation to the habitat of a threatened species or ecological community:*  
(i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*  
(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*  
(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 will result in the removal of approximately 0.49ha of marginal nesting habitat. However, no important areas of habitat for the Glossy Black Cockatoo will be removed, modified, fragment or isolated.



- 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).*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A5.

**Table A5: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

#### Bibliography:

Pizzey, G. & Knight, F. (1997). *Field Guide to the Birds of Australia*, Angus and Robertson, Sydney.

Slater, P., Slater, P. & Slater, R. (1995). *The Slater Field Guide to Australian Birds*, Lansdowne Publishing Pty. Ltd., Sydney

**6. *Petaurus norfolcensis* Squirrel Glider**

Description

The Squirrel Glider (*Petaurus norfolcensis*) is a medium sized arboreal gliding marsupial with long grey fur and a pronounced black dorsal strip extending from between the eyes to the base of the tail. The belly fur is white and the tail is grey and fluffy. The gliding membrane (patagium) extends from the wrist to the ankle. The Squirrel Glider is similar to the Sugar Glider (*Petaurus breviceps*) however is larger with a longer pointed face, longer and narrower ears and a much bushier furred tail.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements

Throughout its range *P. norfolcensis* is found in dry forest and woodland associations dominated by winter flowering eucalypts or with an understorey of winter flowering Banksias or gum producing Acacias (Smith, 2002). Squirrel Gliders nest in tree hollows or “dens” with a range of entrance diameters of 4-15cm. Squirrel Glider colonies and individuals may change nest sites frequently within their home range.

The Squirrel Glider eats a high proportion of invertebrates from the foliage of Eucalypts and Acacias supplemented by plant exudates in the form of Eucalypt and *Melaleuca* sap and *Acacia* gum. Insects (Coleoptera) and caterpillars (larval Lepidoptera) were found to be very important in its diet. The plant exudates, honeydew, pollen and nectar were considered to be more important in winter and spring. It is also likely that birds eggs are included in its diet. It is thought that a mixed stand of gum and high nectar producing Eucalypts, (including some which flower in winter) were important to support the Squirrel Glider.

Distribution

The Squirrel Glider is distributed throughout the dry sclerophyll forests and woodlands of eastern Australia from South Australia to Cairns. In Victoria its range was considered to be narrow where it inhabited remnant woodlands and open forests which have mature or mixed-age stands of more than one Eucalypt species, or riparian forests of *Eucalyptus camaldulensis* (River Red Gum). In N.S.W., the Squirrel Gliders’ range has recently been extended to coastal habitats, including Swamp Mahogany Swamp forests on the Central Coast. In Victoria the Squirrel Glider occurs predominantly in dry woodland west of the Great Dividing Range. The full range of habitats in which it is found in N.S.W. have not been fully reported in any literature.

The squirrel glider has been recorded from Tomaree National Park where it is considered to be widespread. It has been recorded over the Tomago sandbeds and Port Stephens from a range of localities that support high quality habitat. A local population is resident in the study area and within the local fragment of coastal swamp forest and open forest in Stockton Bight.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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.*

An individual Squirrel Glider was recorded within the study area as a result of the trapping survey. No gliders were observed during spotlighting surveys. The study area contained suitable foraging and

nesting habitat for the Squirrel Glider. No hollow-bearing trees will be removed as a result of the proposal. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

c) *In relation to the habitat of a threatened species or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
- (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*
- (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 will result in the removal of approximately 0.49ha of suitable foraging habitat. However, no important areas of habitat for the Squirrel Glider will be removed, modified, fragment or isolated.

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).*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A6.

**Table A6: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area.

Key Threatening Process	Applicability in regards to the study area
	The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

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**7. *Micronomus norfolkensis* Eastern Freetail-bat**

Description

*Micronomus norfolkensis* (Eastern Freetail-bat) has dark brown to reddish brown fur on the back and is slightly paler below. Like other freetail-bats it has a long (3 - 4 cm) bare tail protruding from the tail membrane. Like other freetail-bats they have hairless faces with wrinkled lips and triangular ears.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

*Micronomus norfolkensis* occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. It roosts mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.

Distribution

The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Eastern Freetail-bat was recorded within the study area as a result of the bat call survey. The study area contained suitable hunting and roosting for this microchiropteran species. However, no hollow-bearing trees will be removed as a result of the proposal. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

- b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
  - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

- c) *In relation to the habitat of a threatened species or ecological community:*
- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - (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*
  - (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 will result in the removal of approximately 0.49ha of suitable hunting habitat. However, no important areas of habitat for this species will be removed, modified, fragment or isolated.

- 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).

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A7.

**Table A7: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

#### Bibliography:

Allison, F.R. and Hoyer, G.A. (1995) Eastern Freetail-bat *Mormopterus norfolkensis* Ppp 484-5 in Strahan, R. (ed.). The Mammals of Australia. Reed Books, Sydney.

Churchill, S. (2008). Australian Bats. Allen & Unwin, Crows Nest, Australia.

**8. *Miniopterus australis* Little Bentwing-bat**

Description

*Miniopterus australis* (Little Bentwing-bat) has uniform chocolate fur on the back and slightly lighter fur on the belly. It has a short muzzle and domed head. The ears are short and rounded. The last phalanx on the third finger of the wing is about four times the length of the middle phalanx. This species is very similar to *Miniopterus schreibersii oceanensis* (Large Bentwing-bat) but has a smaller forearm (37 to 41mm).

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

This species inhabits tropical rainforest to warm-temperate wet and dry sclerophyll forest occurring along the coastal plains and adjacent ranges from Cape York to north-eastern N.S.W. It is a sub-canopy hunter with a preference for well-timbered areas but it is also known to hunt in clearings adjacent to forests. Prey items include crane flies, ants, moths and wasps. Flight characteristics include rapid movement with considerable maneuverability.

The species is a cave dweller that congregates in the summer months in maternity roost colonies and disperses during winter. In the southern part of their range they hibernate during winter but in the north they remain active throughout the year. Recorded roosts include caves, mines, stormwater drains, disused railway tunnels and houses. Mating, fertilisation and implantation occur from July to August, followed by a period of retarded embryonic development until mid-September. Pregnant females congregate in specified large nursery caves to rear their young. Births occur in December, when single young are born. It is often found to roost with the Large Bentwing-bat (*Miniopterus schreibersii*), and benefits from this larger species' ability to increase the roost temperature using metabolic heat. There is a huge nursery colony of 100,000 adult bats at Mt. Etna caves, in central Queensland.

Distribution

This species inhabits tropical rainforest to warm-temperate wet and dry sclerophyll forest occurring along the coastal plains and adjacent ranges from Cape York to north-eastern N.S.W. around the Hunter River. Its distribution within Australia becomes increasingly coastal towards the southern limit of its range in N.S.W.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Little Bentwing-bat was recorded within the study area as a result of the bat call survey. The study area contained suitable hunting habitat for this microchiropteran species. However, preferred roosting habitat in the form of cave and culverts was absent. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

c) *In relation to the habitat of a threatened species or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
- (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*
- (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 will result in the removal of approximately 0.49ha of suitable hunting habitat. However, no important areas of habitat for this species will be removed, modified, fragment or isolated.

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).*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A8.

**Table A8: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners	Noisy miners were recorded within the study area. The

Key Threatening Process	Applicability in regards to the study area
( <i>Manorina melanocephala</i> )	proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

**Bibliography:**

Churchill, S. (1998). Australian Bats. Reed New Holland Publishers, Sydney, Australia.

Dwyer, P.D. (1995). Little Bentwing-bat (*Miniopterus australis*). In: The Mammals of Australia, pp: 492-493. Strahan, R. (Ed). Reed Books, Australia.

NPWS. (2003). Atlas of NSW Wildlife, at 'www.nationalparks.nsw.gov.au'.

Parnaby, H. (1992). An Interim Guide to Identification of Insectivorous Bats of South-eastern Australia. Technical Reports of the Australian Museum, Sydney.



**9. *Miniopterus orianae oceanensis* Eastern Freetail Bat**

Description

The Eastern Bentwing-bat has chocolate to reddish-brown fur on its back and slightly lighter coloured fur on its belly. It has a short snout and a high 'domed' head with short round ears. The wing membranes attach to the ankle, not to the base of the toe. The last bone of the third finger is much longer than the other finger-bones giving the "bent wing" appearance. It weighs up to 20 grams, has a head and body length of about 6 cm and a wingspan of 30 - 35 cm.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the tree tops.

Distribution

Eastern Bentwing-bats occur along the east and north-west coasts of Australia.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Eastern Bentwing-bat was recorded within the study area as a result of the bat call survey. The study area contained suitable hunting habitat for this microchiropteran species. However, preferred roosting habitat in the form of cave and culverts was absent. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

- b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
  - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

- c) *In relation to the habitat of a threatened species or ecological community:*
- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - (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*
  - (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 will result in the removal of approximately 0.49ha of suitable hunting habitat. However, no important areas of habitat for this species will be removed, modified, fragment or isolated.

- 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).*

The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).

- e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A9.

**Table A9: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

#### Bibliography:

Churchill, S. (1998). Australian Bats. Reed New Holland Publishers, Sydney, Australia.

NPWS. (2003). Atlas of NSW Wildlife, at 'www.nationalparks.nsw.gov.au'.

Parnaby, H. (1992). An Interim Guide to Identification of Insectivorous Bats of South-eastern Australia. Technical Reports of the Australian Museum, Sydney.

**10. *Myotis macropus***

**Large-footed Myotis**

Description

It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws. It has dark-grey to reddish brown fur above and is paler below. It weighs up to 15 grams and has a wingspan of about 28 cm.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.

Distribution

Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.

**Five Part Test of Significance**

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Large-footed Myotis was recorded within the study area as a result of the bat call survey. The study area contained suitable hunting habitat over the constructed dams. Preferred roosting habitat in the form of cave and culverts was absent. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

- b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA

- c) *In relation to the habitat of a threatened species or ecological community:*
- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - (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*
  - (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 will result in the removal of approximately 0.49ha of suitable hunting habitat. However, no important areas of habitat for this species will be removed, modified, fragment or isolated.

- 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).*

*The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).*

- e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A10.

**Table A10: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

**Bibliography:**

Churchill, S. (1998). Australian Bats. Reed New Holland Publishers, Sydney, Australia.

NPWS. (2003). Atlas of NSW Wildlife, at 'www.nationalparks.nsw.gov.au'.

Parnaby, H. (1992). An Interim Guide to Identification of Insectivorous Bats of South-eastern Australia. Technical Reports of the Australian Museum, Sydney.

**11. *Scoteanax rueppellii***

**Greater Broad-nosed Bat**

Description

The Greater Broad-nosed Bat is a large powerful bat, up to 95 mm long, with a broad head and a short square muzzle. It is dark reddish-brown to mid-brown above and slightly paler below. It is distinguished from other broad-nosed bats by its greater size.

Conservation Status

Biodiversity Conservation Act 2016 – Listed as Vulnerable.

Environmental Protection and Biodiversity Conservation Act 1999 – Not listed.

Habitat Requirements and Ecology

This species apparently feeds on large moths and beetles, and some small vertebrates, emerging just after sundown, flying slowly and directly at a height of 3-6 metres, deviating only slightly to catch larger insects. It is also predatory on vertebrates including other bats, and is a noted carnivore on other captured bats in bat traps. *S. rueppellii* is known to hunt along tree-lined creeks, the junction of woodland and cleared paddocks, and low along rainforest creeks. It may have a preference for wet gullies in tall timber country.

The species roosts mainly in tree hollows but it has also been found in the roof spaces of old buildings. Little is known of the reproductive cycle, but it is suggested that the species follows the typical Vespertilionid pattern. What is known is that females congregate in maternity colonies and single young are born in January, slightly later than the other Vespertilionid bats that share its range. Males appear to be excluded from the colony during the birthing and rearing of the young.

Distribution

The Greater Broad-nosed Bat occurs only along the eastern coastal strip of Queensland and NSW where it is restricted to the coast and adjacent areas of the Great Dividing Range. In NSW it extends as far south as the Bega Plain. They are only found at low altitudes (below 500m).

Five Part Test of Significance

*The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following 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:*

- a) *in the case of a threatened species, whether the proposed development or activity 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 Greater Broad-nosed Bat was recorded within the study area as a result of the bat call survey. The study area contained suitable hunting and roosting for this microchiropteran species. However, no hollow-bearing trees will be removed as a result of the proposal. The proposal will result in a small incremental reduction in foraging habitat, however is unlikely to result in the extinction of any local population of this species.

- b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*  
(ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

NA



- c) *In relation to the habitat of a threatened species or ecological community:*
- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
  - (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*
  - (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 will result in the removal of approximately 0.49ha of suitable hunting habitat. However, no important areas of habitat for this species will be removed, modified, fragment or isolated.

- 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).*

*The proposal will not have an impact on areas of outstanding biodiversity value (either directly or indirectly).*

- e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the study area have been listed in Table A11.

**Table A11: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the study area
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the study area. The proposal is not likely to result in an increase in invasion by exotic perennial grasses.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the study area.

**Bibliography:**

Churchill, S. (1998). Australian Bats. Reed New Holland Publishers, Sydney, Australia.

Hoye, G.A. and Richards, G.C. (1995). Greater Broad-nosed Bat (*Scoteanax rueppellii*). In: The Mammals of Australia, pp: 527-8. Strahan, R. (Ed). Australian Museum / Reed Books, Sydney.

NPWS. (2003). Atlas of NSW Wildlife, at '[www.nationalparks.nsw.gov.au](http://www.nationalparks.nsw.gov.au)'.

## **APPENDIX B**

### **TOTAL FLORA LIST**

Introduced species are indicated by an asterisk (“\*”).

The following standard abbreviations are used to indicate subspecific taxa:

- subsp.** subspecies
- var.-** variety
- x -** hybrid between the two indicated species

**Threatened Species - NSW Biodiversity Conservation Act 2016 (BC Act)**

- V** Vulnerable
- E1** Endangered
- E2** Endangered Population
- E4A** Critically Endangered Population

**Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)**

- V** Vulnerable
- E** Endangered
- CE** Critically Endangered

**Serious and Irreversible Impact SAI**

**Regional Significance (Hunter Rare Plants Database – Version 1 2003)**

- L** endemic to Hunter Region
- DA** disjunct in the Hunter Region, rare or localized (aggregated)
- DB** disjunct in the Hunter Region, widespread and uncommon (broad)
- R** rare but extends beyond the Hunter Region
- U** everywhere uncommon
- N** at northern distributional limit in the Hunter
- E** at eastern distributional limit in the Hunter
- S** at southern distributional limited in the Hunter
- W** at western distributional limited in the Hunter
- T** may be threatened in the Hunter Region
- S** Probably secure in the Hunter Region

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>CLASS PSILOACEAE</b>						
<i>Psilotum nudum</i>	Skeleton Fork Fern					
<b>CLASS FILICOPSIDA (Ferns)</b>						
<b>Adiantaceae</b> syn. Sinopteridaceae						
<i>Adiantum aethiopicum</i>	Common Maidenhair Fern					
<i>Pellaea falcata</i> subsp. <i>falcata</i>	Sickle Fern					
<i>Pellaea paradoxa</i>						
<b>Aspleniaceae</b>						
<i>Asplenium australasicum</i>	Birdnest Fern					
<b>Blechnaceae</b>						
<i>Blechnum indicum</i>	Swamp Water Fern					
<i>Doodia aspera</i>	Rasp Fern					
<i>Doodia australis</i>	Common Rasp Fern					
<b>Dennstaedtiaceae</b>						
<i>Histiopteris incisa</i>	Batswing Fern					
<i>Hypolepis muelleri</i>	Harsh Ground Fern					
<i>Pteridium esculentum</i>	Bracken					
<b>Dicksoniaceae</b>						
<i>Calochlaena dubia</i>	Soft Bracken Fern					
<b>Gleicheniaceae</b>						
<i>Gleichenia dicarpa</i>	Pouched Coral Fern					
<b>Lindaeaceae</b>						
<i>Lindsaea linearis</i>	Screw Fern					
<i>Lindsaea microphylla</i>	Lacy Wedge Fern					
<b>Polypodiaceae</b>						
<i>Platyserium bifurcatum</i>	Elkhorn				W	
<i>Pyrrosia rupestris</i>	Rock Felt Fern					



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<b>Pteridaceae</b>						
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Mulga Fern					
<b>CONIFEROPSIDA (Conifers)</b>						
<b>Pinaceae</b>						
* <i>Pinus elliotii</i>	Slash Pine					
<b>MAGNOLIOPSIDA: Magnoliidae</b>						
<b>LILOPSIDA: (Monocotyledons)</b>						
<b>Anthericaceae</b>						
<i>Caesia parviflora</i>	Pale Grass-lily					
<i>Laxmannia gracilis</i>	Slender Wire Lily					
<i>Sowerbaea juncea</i>	Vanilla Lily					
<i>Thysanotus tuberosus</i>	Common Fringe Lily					Oct
<i>Tricoryne elatior</i>	Yellow Rush-lily					
<b>Asparagaceae</b>						
* <i>Asparagus aethiopicus</i>	Asparagus Fern					
<b>Colchicaceae</b>						
<i>Burchardia umbellata</i>	Milkmaids					Sept
<i>Wurmbea dioica</i>	Early Nancy					
<b>Commelinaceae</b>						
<i>Commelina cyanea</i>	Scurvy Weed					
<b>Cyperaceae</b>						
<i>Baumea rubiginosa</i>	Soft Twigrush					
<i>Carex appressa</i>	Saw Sedge					
<i>Carex maculata</i>						
* <i>Cyperus brevifolius</i>	Mullumbimby Couch					
<i>Cyperus difformis</i>	Dirty Dora					
* <i>Cyperus eragrostis</i>	Umbrella Sedge					

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<i>Cyperus polystachyos</i>	Bunchy Sedge					
<i>Fimbristylis dichotoma</i>	Common Fringe Sedge					
<i>*Isolepis prolifer</i>	Budding Club Rush					
<i>Gahnia aspera</i>	Rough Saw Sedge					
<i>Gahnia clarkei</i> amended	Sword Grass					
<i>Gahnia melanocarpa</i>	Black-fruit Saw-sedge					
<i>Gahnia radula</i>						
<i>Lepidosperma gunnii</i>	A Sword Sedge				W N D	
<i>Lepidosperma laterale</i>	Sword Sedge					
<i>Ptilothrix deusta</i>						
<i>Schoenus apogon</i>	Common Bog-rush					
<b>Doryanthaceae</b>						
<i>Doryanthes excelsa</i>	Gynea Lily					
<b>Hypoxidaceae</b>						
<i>Hypoxis hygrometrica</i>	Golden Weather-grass					
<b>Iridaceae</b>						
<i>Pattersonia sericea</i>	Silky Purple Flag					
<i>*Romulea rosea</i> var. <i>australis</i>	Onion Grass					
<b>Juncaceae</b>						
<i>*Juncus cognatus</i>						
<i>Juncus planifolius</i>						
<i>Juncus prismatocarpus</i>						
<i>Juncus subsecundus</i>	Finger Rush					
<i>Juncus usitatus</i>	Common Rush					
<b>Juncaginaceae</b>						
<i>Triglochin procerum</i> var. <i>procerum</i>	Water Ribbons					
<b>Lemnaceae change to Araceae</b>						
<b>Lomandraceae</b>						

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<i>Lomandra cylindrica</i>						
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Wattle Mat-rush					
<i>Lomandra glauca</i>	Pale Mat-rush					
<i>Lomandra gracilis</i>						
<i>Lomandra longifolia</i>	Spiny Mat Rush					Sept
<i>Lomandra micrantha</i>	Small-flowered Mat-Rush					April, May
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush					Sept
<i>Lomandra obliqua</i>	Fish Bones					Sept
<b>Luzuriagaceae</b>						
<i>Eustrephus latifolius</i>	Wombat Berry					
<i>Geitonoplesium cymosum</i>	Scrambling Lily					
<b>Orchidaceae</b>						
<i>Acianthus apprimus</i>	Mosquito Orchid				D	Feb, Apr
<i>Acianthus caudatus</i> syn. <i>Nemacianthus caudatus</i>	Mayfly Orchid					Sept
<i>Acianthus fornicatus</i>	Pixie Orchid					Aug
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E	V			
<i>Caleana major</i>	Large Duck Orchid					Sept
<i>Calochilus campestris</i>	Copper Beard Orchid					
<i>Calochilus paludosus</i>	Red Beardie					Sept, Oct
<i>Calochilus robertsonii</i>	Purplish Beard Orchid					
<i>Chiloglottis diphylla</i>						
<i>Chiloglottis reflexa</i>	Short-clubbed Wasp Orchid					
<i>Corunastylis</i> sp. <i>Charmhaven</i> (NSW896673)		E4A				
<i>Corybas barbarae</i>	Fairy Lanterns					
<i>Corybas dowlingii</i>	Red Lanterns	V				June, July
<i>Corybas pruinosus</i> syn. <i>Corysanthes pruinosa</i>	Toothed Helmet Orchid					
<i>Cryptostylis erecta</i>	Hooded Orchid					
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	E	E			Nov, Dec, Jan
<i>Cryptostylis subulata</i>	Large Tongue-orchid					Nov, Dec
<i>Cyanicula caerulea</i>	Blue Caladenia					
<i>Cymbidium canaliculatum</i>	Tiger orchid tree	E – pop Hunter				
<i>Cymbidium suave</i>	Snake Flower					Sept, Oct

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<i>Dendrobium aemulum</i>	Ironbark Orchid					
<i>Dendrobium melaleucaphilum</i>	Spider Orchid	E				
<i>Dendrobium speciosum</i>	Rock Lily					
<i>Dendrobium teretifolium</i>	Pencil Orchid					
<i>Dipodium punctatum</i>	Hyacinth Orchid					
<i>Dipodium variegatum</i>	Hyacinth Orchid					
<i>Diuris arenaria</i>	Tomaree Doubletail	V				Aug, Sept
<i>Diuris</i> sp. aff. <i>dendrobioides</i> (Hunter Valley)					R*	Sept
<i>Diuris disposita</i>	Willawarrin Doubletail	E				Sept, Oct
<i>Diuris pedunculata</i>	Small Snake Orchid	E	E			Aug, Sept, Oct
<i>Diuris</i> sp. aff. <i>punctata</i> (Ellalong)					Important taxa	
<i>Diuris praecox</i>	Donkey Orchid	V	V			July, Aug, Sept
<i>Lyperanthus suaveolens</i>	Brown Beaks					
<i>Microtis parviflora</i>	Slender Onion Orchid					Sept, Oct
<i>Myrmecophila formicifera</i> syn. <i>Chiloglottis formicifera</i>	Common Ant Orchid					April, May
<i>Petalochilus alatus</i> syn. <i>Caladenia alata</i>						
<i>Petalochilus carneus</i> syn. <i>Caladenia carnea</i>	Pink Fingers					
<i>Petalochilus catenatus</i> syn. <i>Caladenia catenata</i>	White Fingers					Aug, Sept
<i>Petalochilus pictus</i> syn. <i>Caladenia picta</i>	Painted Fingers					
<i>Petalochilus quadrifarius</i> syn. <i>Caladenia quadrifaria</i>	Large Pink Fingers					Sept
<i>Pterostylis acuminata</i>	Sharp Greenhood					Sept
<i>Pterostylis baptistii</i>	King Greenhood					Aug, Sept
<i>Pterostylis cobarensis</i>	Cobar Rustyhood	V				
<i>Pterostylis curta</i>	Blunt Greenhood					
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	E		DA R U N	Sept, Oct
<i>Pterostylis longifolia</i>	Tall Greenhood					
<i>Pterostylis nutans</i>	Nodding Greenhood					Jun, Jul, Aug
<i>Pterostylis obtusa</i>	Blunt-Tongue Greenhood					
<i>Pterostylis pedunculata</i>	Maroonhood					
<i>Spiranthes sinensis</i>	Ladies Tresses					Late Feb, Mar
<b>Pandanaceae</b>						
<i>Pandanus tectorius</i>	Pandanus					
<b>Philydraceae</b>						

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<i>Philydrum lanuginosum</i>	Woolly Frogsmouth					
<b>Phormiaceae</b>						
<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax-lily					
<b>Poaceae</b>						
* <i>Aira cupaniana</i>	Silvery Grass					
<i>Agrostis avenacea</i>	Blown Grass					
* <i>Andropogon virginicus</i>	Whisky Grass					
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass					
<i>Aristida jerichoensis</i>	Jericho Wiregrass					
<i>Aristida lignosa</i>						
<i>Aristida ramosa</i> var. <i>ramosa</i>	Three-awn Speargrass				W?	
<i>Aristida vagans</i>	Three-awn Speargrass					
<i>Aristida warburgii</i>						
* <i>Arundo donax</i>	Giant Reed					
<i>Austrostipa pubescens</i>						
<i>Austrostipa ramosissima</i>	Stout Bamboo Grass					
<i>Austrostipa scabra</i>	Speargrass					
<i>Austrostipa verticillata</i>	Slender Bamboo Grass					
* <i>Avena fatua</i>	Wild Oats					
* <i>Axonopus fissifolius</i>	Narrow-leaved Carpet Grass					
<i>Bothriochloa biloba</i>	Lobed Bluegrass		V		E? R*	
<i>Bothriochloa decipens</i>	Red grass					
<i>Bothriochloa macra</i>	Red Grass					
* <i>Briza maxima</i>	Quaking Grass					
* <i>Briza minor</i>	Shivery Grass					
* <i>Briza subaristata</i>	Perennial Quaking Grass					
* <i>Bromus catharticus</i>	Prairie Grass					
<i>Capillipedium spicigerum</i>	Scented Top					
* <i>Cenchrus clandestinus</i> syn <i>Pennisetum clandestinum</i>	Kikuyu					
* <i>Chloris gayana</i>	Rhodes Grass					
<i>Chloris truncata</i>	Windmill Grass					
<i>Chloris ventricosa</i>	Tall Windmill Grass					



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<i>Cleistochloa rigida</i>						
* <i>Cortaderia selloana</i>	Pampas Grass					
<i>Cynodon dactylon</i>	Common Couch					
* <i>Cymbopogon citratus</i>	Lemon Grass					
<i>Cymbopogon refractus</i>	Barbed Wire Grass					
<i>Dactyloctenium radulans</i>	Button Grass					
<i>Dichanthium setosum</i>	Blue Grass	V	V			
<i>Dichelachne micrantha</i>	Plume Grass					
<i>Dichelachne rara</i>						
<i>Digitaria brownii</i>	Cotton Panic Grass					
<i>Digitaria parviflora</i>	Smallflower Fingergrass					
<i>Digitaria porrecta</i>	Finger Panic Grass	E	E			
* <i>Echinochloa esculenta</i>	Japanese Millet					
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	Hedgehog Grass					
<i>Echinopogon ovatus</i>	Hedgehog Grass					
* <i>Ehrharta erecta</i>	Panic Veldt Grass					
* <i>Elusine indica</i>	Crowsfoot Grass					
* <i>Elusine tristachya</i>	Goose Grass					
<i>Elymus scaber</i>						
<i>Entolasia marginata</i>	Bordered Panic					
<i>Entolasia stricta</i>	Wiry Panic					
<i>Eragrostis brownii</i>	Browns Love Grass					
* <i>Eragrostis cilianensis</i>	Stinkgrass					
* <i>Eragrostis curvula</i>	African Lovegrass					
<i>Eragrostis elongata</i>	Clustered Lovegrass					
<i>Eragrostis interrupta</i>	Lovegrass					
<i>Eragrostis leptostachya</i>	Paddock Lovegrass					
* <i>Eragrostis tenuifolia</i>	Elastic Grass					
* <i>Hainardia cylindrica</i>	Common Barb-grass					
<i>Hemarthria uncinata</i>	Matgrass					
* <i>Hordeum leporinum</i>	Barley Grass					
* <i>Hordeum marinum</i>	Sea Barley Grass					
* <i>Hyparrhenia hirta</i>	Coolatai grass					Sept
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass					
<i>Ischaemum australe</i>	Thigh-socket Grass					

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<i>Lachnagrostis filiformis</i>	Common Blown-grass					
* <i>Lolium perenne</i>	Perennial Ryegrass					
* <i>Megathyrsus maximus</i> syn. <i>Panicum maximum</i>	Guinea Grass					
* <i>Melinis repens</i>	Red Natal Grass					
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Meadow Grass					
<i>Oplismenus aemulus</i>	Basket Grass					
<i>Oplismenus imbecillis</i>	Basket Grass					
<i>Panicum effusum</i>	Hairy Panic					
<i>Panicum pygmaeum</i>	Pygmy Panic					
<i>Panicum simile</i>	Two Colour Panic					
* <i>Panicum repens</i>	Torpedo Grass					
<i>Paspalidium distans</i>	Spreading Panic Grass					
* <i>Paspalum dilatatum</i>	Paspalum					
<i>Paspalum distichum</i>	Water Couch					
* <i>Paspalum urvillei</i>	Vasey Grass					
<i>Paspalum vaginatum</i>	Saltwater Couch					
* <i>Pennisetum setaceum</i>	African fountain grass					
<i>Phragmites australis</i>	Native Reed					
* <i>Phalaris aquatica</i>	Phalaris					
* <i>Poa annua</i>	Winter Grass					Aug, Sept
<i>Poa labillardieri</i>	Tussock Grass					
<i>Poa sieberiana</i>	Snow Grass					
* <i>Polypogon monspeliensis</i>	Annual Beardgrass					
<i>Rytidosperma bipartitum</i>	Wallaby Grass					
<i>Rytidosperma fulvum</i>	Wallaby Grass					
<i>Rytidosperma pallidum</i> syn. <i>Joycea pallida</i>	Red-anthered Wallaby Grass					Oct 13, Nov 14
* <i>Setaria gracilis</i>	Slender Pigeon Grass					
* <i>Setaria palmifolia</i>	Palm Grass					
* <i>Setaria sphacelata</i>	South African Pigeon Grass					
* <i>Sporobolus africanus</i>	Parramatta Grass					
<i>Spinifex sericeus</i>	Hairy Spinefex					
* <i>Sorghum halepense</i>	Johnson Grass					
<i>Sorghum leiocladum</i>	Wild Sorghum					
* <i>Sporobolus africanus</i>	Parramatta Grass					
<i>Sporobolus creber</i>	Slender Rats Tail					

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<i>*Stenotaphrum secundatum</i>	Buffalo Grass					
<i>Themeda australis</i>	Kangaroo Grass					Oct, Nov
<i>*Urochloa panicoides</i>	Liverseed Grass					
<i>*Vulpia bromoides</i>	Fescue					
<i>Zoysia micrantha</i> subsp. <i>macratha</i>	Prickly Couch					
<b>Restionaceae</b>						
<i>Baloskion tetraphyllum</i> subsp. <i>meiostachyum</i>	Plume Rush					
<i>Empodisma minus</i>	Spreading Rope Rush					
<b>Smilacaceae</b>						
<i>Smilax australis</i>	Smilax					
<i>Smilax glycyphylla</i>	Native Sarsaparilla					
<b>MAGNOLIIDAE (Dicotyledons)</b>						
<b>Acanthaceae</b>						
<i>Brunoniella australis</i>	Blue Trumpet					
<i>Pseuderanthemum variabile</i>	Pastel Flower					
<b>Amaranthaceae</b>						
<i>Alternanthera denticulata</i>	Lesser Joyweed					
<i>*Gomphrena celosioides</i>	Gomphrena Weed					
<b>Apiaceae</b>						
<i>Centella asiatica</i>	Indian Pennywort					
<i>*Hydrocotyle bonariensis</i>	Kurnell Curse					
<i>Hydrocotyle sibthorpioides</i>						
<i>Hydrocotyle tripartita</i>	Penny-weed					
<b>Apocynaceae</b>						
<i>*Gomphocarpus fruticosus</i>	Narrow-leaved Cottonbush					
<i>Marsdenia rostrata</i>	Common Milk Vine				W	
<i>Parsonsia straminea</i> var. <i>straminea</i>	Common Silkpod/Monkey Rope				W?	

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<b>Araliaceae</b>						
<i>Polyscias sambucifolia</i>	Elderberry Panax					
<b>Asteraceae</b>						
* <i>Ageratina adenophora</i>	Crofton Weed					Sept
* <i>Ageratina riparia</i>	Mist Flower					
* <i>Aster subulatus</i> syn. <i>Aster squamatus</i>	Bushy Starwort					
* <i>Bidens pilosa</i>	Cobblers Pegs					
* <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush					
* <i>Cirsium vulgare</i>	Spear Thistle					Sept
* <i>Conyza bonariensis</i>	Flax-leaved Fleabane					
<i>Euchiton involucratus</i> syn. <i>Gnaphalium involucratum</i>	Cudweed					
<i>Euchiton sphaericus</i>	Common Cudweed					
* <i>Facelis retusa</i>	Facelis					
* <i>Hypochaeris radicata</i>	Catsear, Flatweed					
<i>Lagenophora stipitata</i> (syn. <i>Lagenifera stipitata</i> )	Blue Bottle-daisy					
<i>Ozothamnus diosmifolium</i>	White Dogwood					Sept
* <i>Senecio madagascariensis</i>	Fireweed					Sept, Oct
<i>Sigesbeckia orientalis</i>	Indian-Weed					
* <i>Sonchus oleraceus</i>	Common Sow Thistle					
* <i>Tagetes minuta</i>	Stinking Roger					
<i>Vernonia cinerea</i> var. <i>cinerea</i>	Ironweed					
<b>Bignoniaceae</b>						
<i>Pandorea pandorana</i>	Wonga-wonga Vine					
<b>Campanulaceae</b>						
<b>Lobeliaceae</b>						
<i>Lobelia purpurascens</i>	White Root					
<b>Caryophyllaceae</b>						
* <i>Stellaria media</i>	Common Chickweed					Aug, Sept
<b>Cassythaceae</b>						

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<i>Cassytha pubescens</i>	Common Devils Twine					
<b>Casuarinaceae</b>						
<i>Allocasuarina littoralis</i>	Black She-oak					
<i>Allocasuarina torulosa</i>	Forest Oak					
<b>Celastraceae</b>						
<i>Denhamia silvestris</i> syn. <i>Maytenus silvestris</i>	Narrow leaved Orangebark				U	Oct, April
<b>Convolvulaceae</b>						
<i>Convolvulus erubescens</i>	Australian Bindweed					
<i>Dichondra repens</i>	Kidney Weed					
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>						
<i>Polymeria calycina</i>	Swamp Bindweed					
<b>Dilleniaceae</b>						
<i>Hibbertia aspera</i>	Rough Guinea Flower					
<i>Hibbertia dentata</i>	Twining Guinea Flower				W	Aug, Sept, Oct
<i>Hibbertia linearis</i>	Guinea Flower					
<i>Hibbertia pedunculata</i>						
<i>Hibbertia ripara</i>	Erect Guinea-flower					
<i>Hibbertia scandens</i>	Climbing Guinea Flower					Sept, Oct
<b>Dioscoreaceae</b>						
<i>Dioscorea transversa</i>	Native Yam					
<b>Doryanthaceae</b>						
<i>Doryanthes excelsa</i>	Gynea Lily					
<b>Droseraceae</b>						
<i>Drosera peltata</i> subsp. <i>peltata</i>	Sundew					
<b>Elaeocarpaceae</b>						
<i>Elaeocarpus reticulatus</i>	Blueberry Ash					Nov



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<b>Ericaceae</b>						
<i>Acrotriche divaricata</i>	Ground Berry				N	
<i>Epacris pulchella</i>	NSW Coral Heath					
<b>Fabaceae Subfamily (Caesalpinioideae)</b>						
<i>*Senna pendula</i> var. <i>glabrata</i>						
<b>Fabaceae Subfamily (Faboideae)</b>						
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea					
<i>Dillwynia retorta</i> subsp. <i>retorta</i>	Heathy Parrot Pea					July, Aug, Sept
<i>Glycine clandestina</i> subsp. complex	Love Creeper					Sept
<i>Gompholobium pinnatum</i>						
<i>Hardenbergia violacea</i>	False Sarsaparilla					Aug, Sept
<i>Kennedia rubicunda</i>	Dusky Coral Pea					Sept, Oct
<i>*Medicago polymorpha</i>	Burr Medic					
<i>*Phaseolus vulgaris</i>	Common Bean					
<i>Phyllota phyllioides</i>	Heath Phyllota					
<i>Platylobium formosum</i>	Handsome Flat-pea					Sept
<i>Pultenaea villosa</i>	Hairy Bush Pea					
<i>*Trifolium repens</i>	White Clover					
<b>Fabaceae (Subfamily Mimosoideae)</b>						
<i>Acacia falcata</i>	Falcata Wattle				W	
<i>Acacia implexa</i>	Hickory					
<i>Acacia longifolia</i>	Sydney Golden Wattle					
<i>Acacia myrtifolia</i>	Myrtle Wattle					
<i>Acacia suaveolens</i>	Sweet-scented Wattle					
<i>Acacia terminalis</i>	Sunshine Wattle					
<i>Acacia ulicifolia</i>	Prickly Moses					
<b>Geraniaceae</b>						
<i>Geranium solanderi</i>	Native Geranium					
<b>Goodeniaceae</b>						
<i>Goodenia bellidifolia</i> subsp. <i>bellidifolia</i>						

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<i>Goodenia heterophylla</i>	Variable-leaved Goodenia					
<i>Goodenia macbarronii</i>	Narrow Goodenia					
<i>Goodenia ovata</i>	Hop Goodenia					Sept
<i>Goodenia paniculata</i>	Branched (Swamp) Goodenia					
<b>Hypericaceae</b>						
<i>Hypericum gramineum</i>	Native St Johns Wort					
<b>Lamiaceae</b>						
* <i>Stachys arvensis</i>	Stagger Weed					
<i>Westringia fruticosa</i>	Coastal Rosemary					
<b>Loranthaceae</b>						
<i>Dendrophthoe vitellina</i>	Apostle Mistletoe					Sept, Oct, Nov
<b>Malvaceae</b>						
* <i>Modiola carliniana</i>	Red-flowered Mallow					Sept
* <i>Sida rhombifolia</i>	Paddys Lucerne					
<b>Menispermaceae</b>						
<i>Stephania japonica</i> var. <i>japonica</i>	Snake Vine					
<b>Myrsinaceae</b>						
<i>Myrsine variabilis</i> syn. <i>Rapanea variabilis</i>	Muttonwood					
<b>Myrtaceae</b>						
<i>Angophora costata</i>	Smooth-barked Apple					Oct, Nov
<i>Angophora hispida</i>	Dwarf Apple					
<i>Angophora inopina</i>	Charmhaven Apple	V	V			
<i>Angophora subvelutina</i>	Broad-leaved Apple					
<i>Backhousia mytifolia</i>	Grey Myrtle					
<i>Baeckea imbricata</i>	Heath Myrtle					
<i>Callistemon acuminatus</i>	Tapering-leaved Bottlebrush					
<i>Callistemon citrinus</i>	Crimson Bottlebrush					
<i>Callistemon linearifolius</i>	Netted Bottlebrush	V				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Callistemon linearis</i>	Narrow-leaved Bottlebrush					
<i>Callistemon pachyphyllus</i>	Wallum Bottlebrush					
<i>Callistemon rigidus</i>	Stiff Bottlebrush					
<i>Callistemon salignus</i>	Willow Bottlebrush					
<i>Callistemon sieberi</i>	River Bottlebrush					
<i>Callistemon viminalis</i>	Weeping Bottlebrush					
<i>Calytrix tetragona</i>	Common Fringe-myrtle					
<i>Choricarpia leptopetala</i>	Brown Myrtle					
<i>Corymbia citriodora</i>	Lemon-scented Gum					
<i>Corymbia intermedia</i>	Pink Bloodwood					
<i>Corymbia eximia</i>	Yellow Bloodwood					
<i>Corymbia gummifera</i>	Red Bloodwood					Jan, Feb, Mar, Apr
<i>Corymbia maculata</i>	Spotted Gum					
<i>Corymbia torelliana</i>	Cadaga					QLD species
<i>Corymbia trachyphloia</i>	White Bloodwood					
<i>Eucalyptus acmenoides</i>	White Mahogany					Sept, Oct
<i>Eucalyptus agglomerata</i>	Blue-leaved Stringybark					
<i>Eucalyptus albens</i>	White Box					
<i>Eucalyptus amplifolia</i> subsp. <i>amplifolia</i>	Cabbage Gum					
<i>Eucalyptus benthamii</i>	Nepean River Gum					
<i>Eucalyptus beyeriana</i>	Beyer's Ironbark					
<i>Eucalyptus bicostata</i>	Eurabbie					
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum					
<i>Eucalyptus botryoides</i>	Bangalay					
<i>Eucalyptus bridgesiana</i>	Apple Box					
<i>Eucalyptus camaldulensis</i>	River Red Gum	E-pop H				
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V			
<i>Eucalyptus canaliculata</i>	Large-fruited Grey Gum					
<i>Eucalyptus capitellata</i>	Brown Stringybark					Jan
<i>Eucalyptus carnea</i>	Grey-leaved Mahogany					
<i>Eucalyptus castrensis</i>	Pokolbin Mallee Box					
<i>Eucalyptus cinerea</i>	Argyle Apple					
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark					Sept, Oct
<i>Eucalyptus dalrympleana</i>	Mountain Gum					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Eucalyptus dawsonii</i>	Slaty Box				N E	Oct
<i>Eucalyptus dealbata</i>	Tumbledown Red Gum					
<i>Eucalyptus deanii</i>	Broad-leaved Blue Gum					
<i>Eucalyptus dives</i>	Broad-leaved Peppermint					
<i>Eucalyptus dwyeri</i>	Dwyer's Red Gum					
<i>Eucalyptus elata</i>	River Peppermint					
<i>Eucalyptus elegans</i>	Northern Narrow-leaved Ironbark					
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark					
<i>Eucalyptus fergusonii</i> subsp. <i>dorsiventralis</i>						
<i>Eucalyptus fergusonii</i> subsp. <i>fergusonii</i>	Ferguson's Ironbark					
<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	Broad-leaved Ironbark					
<i>Eucalyptus fracta</i>	Small-leaved Ironbark					
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V			
<i>Eucalyptus globoidea</i>	White Stringybark					
<i>Eucalyptus globulus</i>	Tasmanian Blue Gum					
<i>Eucalyptus goniocalyx</i>	Bundy					
<i>Eucalyptus grandis</i>	Flooded Gum					Feb
<i>Eucalyptus haemastoma</i>	Scribbly Gum					Jan
<i>Eucalyptus hypostomatica</i>	Southern Forest Box					
<i>Eucalyptus laevopinea</i>	Silver Top Stringybark					
<i>Eucalyptus largeana</i>	Craven Grey Box	E				
<i>Eucalyptus largiflorens</i>	Black Box					
<i>Eucalyptus longifolia</i>	Woollybutt					
<i>Eucalyptus macrorhyncha</i>	Red Stringybark					
<i>Eucalyptus melliodora</i>	Yellow Box					
<i>Eucalyptus microcarpa</i>	Western Grey Box					
<i>Eucalyptus microcorys</i>	Tallowwood					Oct
<i>Eucalyptus moluccana</i>	Grey Box					
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V				
<i>Eucalyptus obliqua</i>	Messmate					
<i>Eucalyptus oblonga</i>	Oblong-leaved Stringybark					
<i>Eucalyptus oreades</i>	Blue Mountains Ash					
<i>Eucalyptus oresbia</i>	Small-fruited Mountain Gum	V				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Eucalyptus paniculata</i> subsp. <i>paniculata</i>	Grey Ironbark					
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	V			
<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i>						
<i>Eucalyptus pauciflora</i>	Snow Gum					
<i>Eucalyptus pilularis</i> ssp. <i>pilularis</i>	Blackbutt					Dec, Jan
<i>Eucalyptus piperita</i>	Sydney Peppermint					Jan
<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Bimble Box					
<i>Eucalyptus</i> sp. Pokolbin	Pokolbin Ironbark					
<i>Eucalyptus placita</i>	Cork-barked Ironbark					
<i>Eucalyptus planchoniana</i>	Bastard Tallowwood					
<i>Eucalyptus polyanthemos</i> subsp. <i>polyanthemos</i>	Red Box					
<i>Eucalyptus prominula</i>	Wollombi Stringybark					
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum					
<i>Eucalyptus pulverulenta</i>	Silver-leaved Gum					
<i>Eucalyptus pumila</i>	Pokolbin Mallee	V				
<i>Eucalyptus punctata</i>	Grey Gum					
<i>Eucalyptus radiata</i>	Small-leaved Peppermint					
<i>Eucalyptus racemosa</i>	Narrow-leaved Scribbly Gum					
<i>Eucalyptus regnans</i>	Mountain Ash					
<i>Eucalyptus resinifera</i> subsp. <i>resinifera</i>	Red Mahogany					
<i>Eucalyptus robusta</i>	Swamp Mahogany					Mar, April, May
<i>Eucalyptus rossii</i>	Inland Scribbly Gum					
<i>Eucalyptus rudderi</i>	Rudder's Box					
<i>Eucalyptus saligna</i>	Sydney Blue Gum					
<i>Eucalyptus scias</i> subsp. <i>scias</i>	Large-fruited Red Mahogany					
<i>Eucalyptus sclerophylla</i>	Hard-leaved Scribbly Gum					
<i>Eucalyptus scoparia</i>	Wallangarra White Gum	V				
<i>Eucalyptus seeana</i>	Narrow-leaved Red Gum	E – pop				
<i>Eucalyptus sieberi</i>	Silvertop Ash					
<i>Eucalyptus siderophloia</i>	Grey Ironbark					
<i>Eucalyptus sideroxylon</i>	Mugga					
<i>Eucalyptus signata</i>	Northern Scribbly Gum					
<i>Eucalyptus socialis</i>	Red Mallee					
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark					
<i>Eucalyptus stellulata</i>	Black Sally					



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<i>Eucalyptus tereticornis</i>	Forest Red Gum					Aug, Sept, Oct
<i>Eucalyptus viminalis</i>	Manna Gum					
<i>Eucalyptus umbra</i>	Thick-leaved White Mahogany					
<i>Euryomyrtus ramosissima</i> subsp. <i>ramosissima</i>	Rosy Baeckea					Sept, Oct
<i>Kunzea ambigua</i>	Tick Bush					Oct, Nov
<i>Kunzea capitata</i>						
<i>Leptospermum juniperinum</i>	Prickly Tea-tree					
<i>Leptospermum laevigatum</i>	Coastal Tea-tree					
<i>Leptospermum parvifolium</i>	Small-leaf Tea Tree					
<i>Leptospermum petersonii</i>	Lemon-scented Teatree					Dec, Jan
<i>Leptospermum polyanthum</i>						
<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i>						
<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i>	Teatree					Sept
<i>Leptospermum semibaccatum</i>						
<i>anthosia</i>	Paperbark Teatree					Oct
<i>Lophostemon confertus</i>	Brush Box					Oct, Nov
* <i>Luma apiculata</i>	Chilean myrtle					
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V				
<i>Melaleuca bracteata</i>	Black Tea-tree					Oct, Nov
<i>Melaleuca decora</i>	White Feather Honeymyrtle					Nov, Dec
<i>Melaleuca ericifolia</i>	Swamp Paperbark					Sept
<i>Melaleuca groveana</i>	Grove's Paperbark	V				
<i>Melaleuca hypericifolia</i>	Hillock Bush					
<i>Melaleuca lineariifolia</i>	Snow in Summer					Oct, Nov
<i>Melaleuca nodosa</i>	Ball Honeymyrtle					Late Sept, Oct
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark					Feb, Mar
<i>Melaleuca sieberi</i>	Sieber's Paperbark					
<i>Melaleuca styphelioides</i>	Prickly-leaved Paperbark					
<i>Melaleuca thymifolia</i>	Thyme Honey-myrtle					
* <i>Metrosideros thomasi</i>	New Zealand Christmas Bush					
<i>Rhodamnia rubescens</i>	Scrub Turpentine	E4A		Yes		
<i>Rhodomyrtus psidioides</i>	Native Guava	E4A		Yes		
<i>Sannantha angusta</i>						
<i>Sannantha crassa</i>						Varient in Seaham area.

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<i>Sannantha similis</i> syn. <i>Babingtonia similis</i>						
* <i>Syzygium aromaticum</i>	Clove					
<i>Syzygium australe</i>	Brush Cherry					
<i>Syzygium oleosum</i>	Blue Lilly Pilly					
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V			Dec - Mar
<i>Syncarpia glomulifera</i>	Turpentine					Sept, Oct
<i>Tristaniopsis laurina</i>	Water Gum					
<i>Tristaniopsis laurina</i>	Luscious TM					Nov, Dec
<i>Waterhousea floribunda</i>	Weeping Lilly Pilly					November
<i>Xanthostemon chrysanthus</i>	Golden Penda					November
<b>Nepenthaceae</b>						
* <i>Nepenthes</i> sp.	Pitcher Plant					Oct, Nov
<b>Nyctaginaceae</b>						
* <i>Bougainvillea</i> sp.						
<b>Nymphaeaceae</b>						
* <i>Nymphaea capensis</i>	Cape Waterlily					
<b>Ochnaceae</b>						
* <i>Ochna serrulata</i>	Ochna					
<b>Oleaceae</b>						
* <i>Fraxinus griffithii</i>	Flowering Ash					Dec
* <i>Fraxinus raywood</i>	Claret Ash					
<i>Jasminum lineare</i>	Desert Jasmine					
* <i>Jasminum polyanthum</i>	Pink Jasmine					
* <i>Ligustrum lucidum</i>	Large-leaved Privet					Jan, Feb
* <i>Ligustrum sinense</i>	Small-leaved Privet					Sept
<i>Notelaea longifolia</i>	Mock Olive					
<i>Notelaea microcarpa</i>	Native Olive					
<i>Notelaea ovata</i>	Mock Olive					
* <i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive					
* <i>Olea europaea</i> subsp. <i>europaea</i>	Common Olive					

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<b>Onagraceae</b>						
<i>Epilobium billardieranum</i> subsp. <i>billardieranum</i>						
* <i>Fuchsia</i> sp.						
* <i>Oenothera drummondii</i>						
* <i>Oenothera glazioviana</i>						
* <i>Oenothera lindheimeri</i> syn. <i>Gaura lindheimeri</i>						
* <i>Oenothera stricta</i> subsp. <i>stricta</i>						
* <i>Ludwigia longifolia</i>	Long-leaf Willow Primrose					Noxious
<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	Water Primrose					
* <i>Ludwigia peruviana</i>	Peruvian Primrose					Noxious
<b>Oxalidaceae</b>						
* <i>Oxalis articulata</i>	Wood-sorrel					
<i>Oxalis corniculata</i>	Creeping Oxalis					
<i>Oxalis perennans</i>	-					
* <i>Oxalis pes-caprae</i>	Soursob					
* <i>Oxalis purpurea</i>						
* <i>Oxalis tuberosa</i>	New Zealand Yam					
* <i>Oxalis versicolor</i>	Candy Cane Sorrel, Barber's Pole					
<b>Papaveraceae</b>						
* <i>Argemone ochroleuca</i> var. <i>ochroleuca</i>	Mexican Poppy					
* <i>Fumaria bastardii</i>	Bastard's Fumitory					
* <i>Fumaria capreolata</i>	White-flower Fumitory					
* <i>Papaver nudicaule</i>	Iceland Poppy					
* <i>Papaver somniferum</i> subsp. <i>setigerum</i>	Opium Poppy					
* <i>Papaver somniferum</i> subsp. <i>somniferum</i>	Opium Poppy					
<b>Passifloraceae</b>						
* <i>Passiflora caerulea</i>	Blue Passion Flower					
* <i>Passiflora edulis</i>	Passionfruit					
<b>Phyllanthaceae</b>						

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<i>Breynia oblongifolia</i>	Coffee Bush					
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree					
<i>Omalanthus populifolius</i>	Bleeding Heart					
<i>Phyllanthus gunnii</i>	Scrubby Spurge					
<i>Phyllanthus hirtellus</i>	Thyme Spurge					
<i>Phyllanthus virgatus</i>	Spurge					
* <i>Phyllanthus tenellus</i>						
<i>Poranthera ericifolia</i>						
<i>Poranthera microphylla</i>						
<b>Picrodendraceae</b>						
<i>Micrantheum ericoides</i>					+	
<b>Platanaceae</b>						
* <i>Platanus xhispanica</i>	London Plane Tree					
<b>Phytolaccaceae</b>						
* <i>Phytolacca octandra</i>	Inkweed					
<b>Pittosporaceae</b>						
<i>Billardiera scandens</i>	Apple Dumplings					Sept
<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Blackthorn					Jan
<i>Hymenosporum flavum</i>	Native Frangipani					Sept
<i>Pittosporum angustifolium</i>	Butterbush					
<i>Pittosporum multiflorum</i> syn. <i>Citriobatus pauciflorus</i>	Orange Thorn					
<i>Pittosporum revolutum</i>	Rough-fruit Pittosporum					
<i>Pittosporum undulatum</i>	Sweet Pittosporum					Aug, Sept
<i>Rhytidosporum procumbens</i>						
<b>Piperaceae</b>						
* <i>Peperomia polybotrya</i>	Coin-leaf Peperomia					
<i>Peperomia tetraphylla</i>	Four-leaved Peperomia					
<i>Piper hederaceum</i> var. <i>hederaceum</i>	Giant Pepper Vine					
<b>Plantaginaceae</b>						

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<i>Plantago debilis</i>						
<i>Plantago gaudichaudii</i>	Narrow Plantain					
* <i>Plantago lanceolata</i>	Plantain					
<b>Plumbaginaceae</b>						
* <i>Limonium</i> sp.	Sea Lavender					
* <i>Limonium lobatum</i>	Winged Sea Lavender					
* <i>Limonium perezii</i>	Statice					
* <i>Plumbago auriculata</i>	Plumbago					
<b>Polygalaceae</b>						
<i>Comesperma ericinum</i>	Matchheads					Aug, Sept
<i>Comesperma sphaerocarpum</i>						
<i>Comesperma volubile</i>						
* <i>Polygala myrtifolia</i> var. <i>myrtifolia</i>						
* <i>Polygala virgata</i>	Broom Milkwort					Oct
<b>Polygonaceae</b>						
* <i>Acetosa sagittata</i>	Turkey Rhubarb					
* <i>Acetosella vulgaris</i>	Sheep Sorrel					
* <i>Fagopyrum esculentum</i>	Buckwheat					
<i>Muehlenbeckia florulenta</i> syn <i>Duma florulenta</i>						
<i>Muehlenbeckia gracillima</i>	Slender Lignum					
* <i>Persicaria capitata</i>	Japanese Knotweed					
<i>Persicaria decipens</i>	Slender Knotweed					
<i>Persicaria elatior</i>	Tall Knotweed	V	V			
<i>Persicaria hydropiper</i>	Water Pepper					
<i>Persicaria lapathifolia</i>	Spotted Knotweed					
<i>Persicaria strigosa</i>	Spotted Knotweed					
* <i>Polygonum aviculare</i>	Wireweed					
* <i>Rheum rhabarbarum</i>	Rhubarb					
<i>Rumex brownii</i>	Swamp Dock					
* <i>Rumex crispus</i>	Curled Dock					
<b>Portulacaceae</b>						



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<i>*Portulaca grandiflora</i>						
<i>Portulaca oleracea</i>	Purslane, Pigweed					
<b>Primulaceae</b>						
<i>*Lysimachia arvensis</i> syn. <i>Anagallis arvensis</i>	Scarlet Pimpernel					
<b>Proteaceae</b>						
<i>Alloxylon flammeum</i>	Tree Waratah					
<i>Banksia aemula</i>	wallum banksia					
<i>Banksia ericifolia</i> ssp. <i>ericifolia</i>	Heath-leaved Banksia					
<i>Banksia integrifolia</i>	Silver Banksia					
<i>Banksia marginata</i>	Silver Banksia					
<i>Banksia oblongifolia</i>	Fern-leaved Banksia					
<i>Banksia robur</i>	Swamp Banksia					
<i>Banksia serrata</i>	Old Man Banksia					
<i>Banksia spinulosa</i> subsp. <i>collina</i>	Hair-pin Banksia					Mar,
<i>Banksia spinulosa</i> subsp. <i>spinulosa</i>	Hair-pin Banksia					
<i>Buckinghamia celsissima</i>	Ivory Curl Flower					Jan, Feb, Mar
<i>Conospermum taxifolium</i>	Conospermum					
<i>Grevillea arenaria</i> subsp. <i>arenaria</i>	Sand Grevillea					
<i>Grevillea buxifolia</i>	Grey Spider Flower					
<i>Grevillea caleyi</i>	Caley's Grevillea	E4A				
<i>Grevillea dactyloides</i>						
<i>Grevillea humilis</i> subsp. <i>humilis</i>						
<i>Grevillea lanigera</i>	Woolly Grevillea					
<i>Grevillea lanigera</i> x <i>lavandulacea</i>	Jelly Baby					
<i>Grevillea montana</i>	Mountain Grevillea					
<i>Grevillea mucronulata</i>						
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flowered Grevillea	V	V			Sept
<i>Grevillea raybrownii</i>						
<i>Grevillea robusta</i>	Silky Oak					
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea					
<i>Grevillea sericea</i> subsp. <i>sericea</i>	Pink Spider Flower					Oct, Nov
<i>Grevillea shiressii</i>		V				
<i>Hakea bakeriana</i>						

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<i>Hakea dactyloides</i>	Broad-leaved Hakea					
<i>Hakea gibbosa</i>	Needlebush					
<i>Hakea sericea</i>	Needlebush					
<i>Hakea tephrosperma</i>	Hooked Needlewood					
<i>Hakea teretifolia</i>	Dagger Hakea					
<i>Isopogon anemonifolius</i>	Drumsticks					
<i>Isopogon anrthifolius</i>	Drumsticks					
<i>Isopogon dawsonii</i>	Nepean Conebush					
<i>Lambertia formosa</i>	Mountain Devil					
<i>Lomatia silaifolia</i>	Crinkle Bush					
<i>Macadamia integrifolia</i>						
<i>Macadamia tetraphylla</i>		V				
<i>Persoonia isophylla</i>						
<i>Persoonia lanceolata</i>	Lance Leaf Geebung					
<i>Persoonia laurina</i> spp. <i>laurina</i>						
<i>Persoonia linearis</i>	Narrow-leaved Geebung					
<i>Persoonia levis</i>	Broad-leaved Geebung					Oct, Nov Fruit-May
<i>Persoonia mollis</i> subsp. <i>nectens</i>						
<i>Persoonia mollis</i> subsp. <i>maxima</i>		E	E			
<i>Persoonia pauciflora</i>	North Rothbury Persoonia	E4A	E			
<i>Petrophile pulchella</i>	Cone-sticks					
<i>Stenocarpus salignus</i>	Scrub Beefwood					
<i>Stenocarpus sinuatus</i>	Firewheel Tree					
<i>Telopea speciosissima</i>	Waratah					
<i>Xylomelum pyrifforme</i>	Woody Pear					
<b>Ranunculaceae</b>						
<i>Clematis aristida</i>	Old Man's Beard					
<i>Clematis glycinoides</i> var. <i>glycinoides</i>	Headache Vine					
<i>Delphinium</i> sp.	Delphinium					
* <i>Helleborus</i> sp.	Hellebore					Sept
<i>Ranunculus inundatus</i>	River Buttercup					
<i>Ranunculus lappaceus</i>	Common Buttercup					
* <i>Ranunculus sceleratus</i>	Celery-leaved Buttercup					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>Rhamnaceae</b>						
<i>Alphitonia excelsa</i>	Red Ash					
<i>Pomaderris brunnea</i>	Rufous Pomaderris	V	V			
<i>Pomaderris lanigera</i>	Woolly Pomaderris					
<i>Pomaderris queenslandica</i>	Scant Pomaderris	E				
<i>Pomaderris reperta</i>	Denman Pomaderris	E4A	CE			
<i>Spyridium burragorang</i>	(E2 – Cessnock)	E2				
<b>Rosaceae</b>						
<i>Acaena novae-zelandiae</i>	Bidgee-widgee					
* <i>Cotoneaster glaucophyllus</i>	Cotoneaster					
* <i>Crataegus monogyna</i>	Hawthorn					
* <i>Cydonia oblonga</i>	Quince					
* <i>Eriobotrya japonica</i>	Loquat					
* <i>Fragaria × ananassa</i>	Strawberry					
* <i>Fragaria vesca</i>	Alpine Strawberry					
* <i>Geum</i> sp.	Geum					
* <i>Malus pumila</i> syn <i>Malus domestica</i>	Apple					
* <i>Mespilus germanica</i>	Medlar					
* <i>Photinia serratifolia</i>	Photinia					
* <i>Portentilla indica</i> syn. <i>Duchesnea indica</i>	Indian Strawberry					
* <i>Pyracantha fortuneana</i>	Firethorn					
* <i>Pyrus calleryana</i>	Callery Pear, Ornamental Pear					
* <i>Pyrus communis</i>	European Pear					
* <i>Pyrus pyrifolia</i>	Nashi pear					
* <i>Raphiolepis indica</i>	Indian Hawthorn					
* <i>Rosa rubiginosa</i>	Sweet Briar					
* <i>Rubus fruticosus</i> ssp. <i>aggregate</i>	Blackberry					
<i>Rubus moluccanus</i> var. <i>trilobus</i>	Broad-leaved Bramble					
<i>Rubus parvifolius</i>	Native Raspberry					
<i>Rubus rosifolius</i>	Rose-leaf Bramble					
<b>Rubiaceae</b>						
<i>Asperula asthenes</i>	Trailing Woodruff	V				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Asperula conferta</i>	Common Woodruff					
<i>Atractocarpus fitzalanii</i>	Brown Gardenia					North Qld
* <i>Coffea arabica</i>	Coffee					
* <i>Coprosma repens</i>	Mirror Bush					
* <i>Galium aparine</i>	Clevers					
<i>Galium binifolium</i> subsp. <i>binifolium</i>						Karuah
<i>Galium gaudichaudii</i>	Rough Bedstraw					
* <i>Gardenia</i> sp.	Gardenia					
<i>Morinda jasminoides</i>	Jasmine Morinda					
<i>Opercularia aspera</i>	Common Stinkweed					
<i>Opercularia diphylla</i>	Stinkweed					
<i>Pomax umbellata</i>	Pomax					
<i>Psychotria loniceroides</i>	Hairy Psychotria					
<i>Psyrdrax odorata</i> syn. <i>Canthium odoratum</i>	Shiny-leaved Canthium					
* <i>Richardia brasiliensis</i>	White Eye					
* <i>Richardia humistrata</i>						
* <i>Richardia stellaris</i>	Field Madder					
<b>Rutaceae</b>						
<i>Acronychia littoralis</i>	Scented Acronychia	E	E			
<i>Acronychia oblongifolia</i>	White Aspen					
<i>Boronia ledifolia</i>	Sydney Boronia					July, August
<i>Boronia pinnata</i>						
<i>Boronia polygalifolia</i>	Dwarf Boronia					
* <i>Calodendrum capense</i>	Cape Chestnut					
* <i>Citrus hystrix</i>	Makrut Lime					
* <i>Citrus × limon</i>	Lemon					
* <i>Citrus reticulata</i>	Mandarin					Sept, Oct
<i>Correa alba</i>	White Correa					
<i>Correa reflexa</i>	Correa					
<i>Crowea saligna</i>						
<i>Eriostemon australasius</i>	Pink Wax Flower					Sept
<i>Geijera parviflora</i>	Wilga					
<i>Geijera salicifolia</i> var. <i>latifolia</i>	Broad-leaved Brush Wilga					
<i>Geijera salicifolia</i> var. <i>salicifolia</i>	Narrow-leaved Brush Wilga					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Leionema elatius</i> subsp. <i>beckleri</i>	Tall Phebalium					
<i>Leionema lamprophyllum</i> ssp. <i>obovatum</i>		E2				
<i>Melicope micrococca</i>	Hairy-leaved Doughwood					
* <i>Murraya paniculata</i>	Murraya					
<i>Nematolepis squamea</i>	Satinwood					Sept
<i>Philotheca ericifolia</i>						
<i>Philotheca hispidula</i>	Rough Wax Plant					
<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i>	Big Yellow Wood					Sept, Oct
<i>Zieria cytisoides</i>	Grey Ghost (pink flowers)					
<i>Zieria prostrata</i>		E				
<i>Zieria prostrata</i>	" Carpet Star"					
<i>Zieria smithii</i>	Sandfly Zieria					Sept, Oct
<b>Salicaceae</b>						
* <i>Populus alba</i>	White Poplar					
* <i>Populus nigra</i>	Lombardy Poplar					
* <i>Salix babylonica</i>	Weeping Willow					
* <i>Salix fragilis</i>	Crack Willow					
* <i>Salix matsudana</i>	Twisted Willow, Chinese Willow					
* <i>Salix nigra</i>	Black Willow					
<b>Salviniaceae</b>						
<i>Salvinia molesta</i>	Salvinia					
<b>Santalaceae</b>						
<i>Choretrum candollei</i>	White Sour Bush					
<i>Choretrum</i> sp. Coxs Gap (B.J.Lepschi 4218 & T.R.Lally) Lepschi						
<i>Exocarpus cupressiformis</i>	Cherry Ballart					
<i>Exocarpus strictus</i>	Dwarf Cherry					
<i>Leptomeria acida</i>	Sour Currant Bush					
<i>Santalum acuminatum</i>	Sweet Quandong					
* <i>Santalum album</i>	Indian Sandalwood					
<i>Santalum lanceolatum</i>	Northern Sandalwood					



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Santalum spicatum</i>	Australian Sandalwood					WA
<i>Thesium australe</i>	Austral toadflax	V	V			
<b>Sapindaceae</b>						
* <i>Acer negundo</i>	Box Elder					
* <i>Acer palmatum</i>	Japanese Maple					
<i>Alectryon oleifolius</i>	Western Rosewood					
<i>Alectryon subcinereus</i>	Native Quince					
* <i>Cardiospermum grandiflorum</i>	Balloon Vine					
<i>Cupaniopsis anacardioides</i>	Tuckeroo					May
<i>Diploglottis australis</i>	Native Tamarind					
<i>Dodonaea viscosa</i> var. <i>angustifolia</i>	Sticky Hop-bush					
<i>Dodonaea viscosa</i> subsp. <i>cuneata</i>	Wedge-leaf Hop Bush					
<i>Dodonaea triangularis</i>	Hop Bush					
<i>Dodonaea triquetra</i>	Hop Bush					
<i>Guioa semiglaucula</i>	Guioa					
* <i>Koelreuteria paniculata</i>	Golden Rain Tree					Mar, Apr
<b>Scrophulariaceae</b>						
<i>Bacopa monnieri</i>	Bacopa (The herb Brahmi)					
<i>Euphrasia arguta</i>	Eyebrights	E4A	Cri E			
<i>Gratiola pedunculata</i>	Stalked Brooklime					
* <i>Linaria arvensis</i>	Corn Toad Flax					
* <i>Linaria pelisseriana</i>	Pelisser's Toadflax					
<i>Lindernia alsinoides</i>	Noah's False Chickweed	E				
* <i>Parentucellia latifolia</i>	Red Bartsia					
* <i>Verbascum thapsus</i> subsp. <i>thapsus</i>	Great Mullein					
* <i>Verbascum virgatum</i>	Twiggy Mullein					
<i>Veronica plebeia</i>	Speedwell					
<b>Simaroubaceae</b>						
* <i>Ailanthus altissima</i>	Tree of Heaven					
<b>Solanaceae</b>						
* <i>Brugmansia</i> sp.	Angles Trumpet					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
* <i>Brunfelsia australis</i>	Yesterday-today & tomorrow					Late Sept, Oct
* <i>Capsicum annuum</i>	Bell Pepper, Chili Pepper					
* <i>Capsicum pubescens</i>						
* <i>Cestrum parqui</i>	Green Cestrum					Sept, Oct
* <i>Cyphomandra betacea</i>	Tamarillo Tree					
* <i>Datura stramonium</i>	Common Thornapple					
<i>Duboisia myoporoides</i>	Corkwood					Late Sept, Oct
<i>Solanum cinereum</i>	Narrawa Burr					
* <i>Solanum lycopersicum</i> Syn. * <i>Lycopersicon esculentum</i>	Tomato					
* <i>Solanum lycopersicum</i>	Black Russian					
* <i>Solanum lycopersicum</i>	Cherry Fountain					
* <i>Solanum lycopersicum</i>	Honey Drop					
* <i>Solanum lycopersicum</i>	Lollipop					
* <i>Solanum lycopersicum</i>	Pink Pearl (Breast Cancer)					
* <i>Solanum melongena</i>	Eggplant, Aubergine					
* <i>Lycium ferocissimum</i>	African Boxthorn					
<i>Nicotiana suaveolens</i>	Native Tobacco					
* <i>Petunia</i> sp.	Petunia					
* <i>Physalis peruviana</i>	Cape Gooseberry					
<i>Solanum aviculare</i>	Kangaroo Apple					
<i>Solanum brownii</i>						
* <i>Solanum crinitum</i> syn. <i>Solanum macranthum</i>	Potato Tree					
* <i>Solanum mauritianum</i>	Wild Tobacco					
* <i>Solanum muricatum</i>	Pepino					
* <i>Solanum nigrum</i>	Blackberry Nightshade					
* <i>Solanum pseudocapsicum</i>	Jerusalem Cherry					
<i>Solanum prinophyllum</i>	Forest Nightshade					
* <i>Solanum seaforthianum</i>	Climbing Nightshade					March, April
<i>Solanum stelligerum</i>	Devils Needle's					
<b>Stackhousiaceae</b>						
<i>Stackhousia monogyna</i>	Creamy Candles					
<i>Stackhousia viminea</i>	Slender Stackhousia					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>Stylidiaceae</b>						
<i>Stylidium graminifolium</i>	Trigger Plant					Sept
<b>Surianaceae</b>						
<i>Cadellia pentastylis</i>	Ooline, Scrub Myrtle	V	V			
<b>Theaceae</b>						
* <i>Camellia japonica</i>	Common Camellia					
* <i>Camellia sasanqua</i>						
* <i>Camellia sinensis</i>	Tea					
<b>Theophrastaceae</b>						
<i>Samolus repens</i>	Creeping Brookweed					
<i>Samolus valerandi</i>	Common Brookweed					
<b>Thymelaeaceae</b>						
<i>Pimelea curviflora</i> var. <i>sericea</i>	Curved Rice Flower					
<i>Pimelea latifolia</i> subsp. <i>elliptifolia</i>						
<i>Pimelea linifolia</i>	Rice Flower					Sept
<b>Tremandraceae</b>						
<i>Tetradthea glandulosa</i>	Black-eyed Susan	V	V			
<i>Tetradthea juncea</i>	Black-eyed Susan	V	V		*	Sept, Oct
<i>Tetradthea shiressii</i>						
<i>Tetradthea thymifolia</i>	Thyme Pink-bells					Sept, Oct
<b>Ulmaceae</b>						
* <i>Celtis australis</i>	Nettle Tree					
<i>Celtis paniculata</i>	Native Celtis, Investigator Tree					
<i>Trema tomentosa</i> var. <i>viridis</i>	Poison Peach					
* <i>Ulmus parvifolia</i>	Chinese Elm					
* <i>Ulmus procera</i>	English Elm					
<b>Urticaceae</b>						
* <i>Parietaria judaica</i>	Asthma Weed					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Urtica incisa</i>	Stinging Nettle					
* <i>Urtica urens</i>	Small Nettle					
<b>Verbenaceae</b>						
* <i>Citharexylum quadrangulare</i>	Fiddlewood					
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum					Oct
* <i>Durandra erecta</i>	Golden Dewdrop					
* <i>Lantana camara</i>	Lantana					Noxious
* <i>Phyla canescens</i>	Lippia					Noxious
* <i>Verbena aristigera</i>	Mayne's Pest, Moss Verbena					
* <i>Verbena bonariensis</i>	Purple Top					
* <i>Verbena rigida</i> var. <i>rigida</i>	Veined Verbena					
<b>Viscaceae</b>						
<i>Korthalsella rubra</i> subsp. <i>geijericola</i>	Wilga Mistletoe					
<i>Korthalsella rubra</i> subsp. <i>rubra</i>	Jointed Mistletoe					
<i>Notothixos cornifolius</i>	Kurrajong Mistletoe					
<i>Notothixos subaureus</i>	Golden Mistletoe				W	
<b>Vitaceae</b>						
<i>Cayratia clematidea</i>	Slender Grape					
<i>Cissus antarctica</i>					W	
<i>Cissus hypoglauca</i>	Native Grape					
<i>Cissus opaca</i>	Small-leaved Water Vine				S	
<i>Tetrastigma nitens</i>						
* <i>Vitis vinifera</i>	Grape-vine					
<b>Violaceae</b>						
<i>Hybanthus monopetalus</i>	Slender Violet-bush					
<i>Hybanthus stellarioides</i>						Orange Flower
<i>Hybanthus vernonii</i> ssp. <i>vernonii</i>						
<i>Melicytus dentatus</i> syn. <i>Hymenanthera dentata</i>	Tree Violet					
<i>Viola banksii</i>	Native Violet					
<i>Viola betonicifolia</i>	Purple Violet					
<i>Viola hederacea</i>	Native Violet					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>Zannichelliaceae</b>						
<i>Zannichellia palustris</i>		E				
<b>Zygophyllaceae</b>						
<i>Tribulus</i> sp.	Caltrop					



## **APPENDIX C**

### **TOTAL FAUNA LIST**

## VERTEBRATE FAUNA LIST

Family sequencing and taxonomy follow for each fauna class:

### Fish

Allen, G.R., Midgley, S.H. & Allen, M. (2002). *Field Guide to the Freshwater Fishes of Australia*. Western Australian Museum, Perth.

### Herpetofauna

Cogger, H.G. (2014). *Reptiles and Amphibians of Australia* (7th edn.). CSIRO Publishing.

### Birds

Pizzey and Knight (2012)(9<sup>th</sup> edn).

### Mammals

Van Dyck, S. and Strahan, R. (Ed) (2008). *The Mammals of Australia* (3rd edn). New Holland Publishers, Australia –

Churchill, S. (2008). *Australian Bats*. (2nd edn.). Allen & Unwin Australia.

(?) - Indicates a species identified without certainty or to a Genus level only.

\* - Indicates an introduced species.

Threatened species addressed within this assessment appear in **bold** font.

Introduced species are indicated by an asterisk (“\*”).

**The following standard abbreviations are used to indicate subspecific taxa:**

**subsp.** -subspecies

**var.-** variety

**x -** hybrid between the two indicated species

### **Biodiversity Conservation Act 2016 (BC Act)**

**V** Vulnerable

**E1** Endangered

**E2** Endangered Population

**E4A** Critically Endangered Population

### **Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)**

**V** **Vulnerable**

**E** **Endangered**

**CE** **Critically Endangered Population**

**M** **Migratory**

### **Regionally Significant Fauna Species.**

**+** Region includes Gosford, Wyong, Cessnock, Maitland, Lake Macquarie, Newcastle and Port Stephens LGA's. Produced from Stage 1 of the LHCCREMS – Regional Biodiversity Conservation Strategy.

### **Observation Type**

**O** - Observed (sighted)

**W** - Heard call

**OW** – Observed and heard call

**X** - In scat

**P** – Scat

**T** - Trapped or netted

**H** – Hair, feathers or skin

**A** - Stranded/Beached

**G** – Crushed cones

**R** – Road Kill

**D** – Dog Kill

**Q** – Camera

**C** – Cat Kill

**V** – Fox Kill

**K** – Dead

**S** – Shot

**I** – Fossil/subfossil

**FB** – Burrow

**F** – Tracks, scratching

**Z** – In raptor/owl Pellet

**U** – Ultrasonic recording

**M** - Miscellaneous

**E** – Nest/roost

**B** - Burnt

**Y** – Bones, teeth or shell

**N** – Not located

**AR** – Acoustic Recording

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Phylum - Chordata</b>					
<b>Subphylum - Vertebrata</b>					
<b>Class Amphibia - Amphibians</b>					
<b>Order Salientia - Frogs</b>					
<b>Family Myobatrachidae - 'Southern Frogs'</b>					
<i>Crinia signifera</i>	Common Eastern Froglet				
<i>Limnodynastes peronii</i>	Striped Marsh Frog				
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog			+	
<i>Pseudophryne bibronii</i>	Brown Toadlet			+	
<i>Uperoleia laevisgata</i>	Smooth Toadlet				
<b>Family Hylidae - Tree Frogs</b>					
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog				
<i>Litoria latopalmata</i>	Broad-palmed Frog				
<i>Litoria peronii</i>	Peron's Tree Frog				
<b>Class Reptilia - Reptiles</b>					
<b>Order Squamata – Lizards and Snakes</b>					
<b>Suborder Sauria - Lizards</b>					
<b>Family Agamidae - Dragons</b>					
<i>Intellagama lesueurii lesueurii</i>	Eastern Water Dragon				
<b>Family Varanidae - Monitors</b>					
<i>Varanus varius</i>	Lace Monitor				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Family Scinidae - Skinks</b>					
<i>Lampropholis delicata</i>	Grass Skink				
<b>Suborder Serpentes - Snakes</b>					
<b>Family Colubridae</b>					
<i>Dendrelaphis punctulata</i>	Green Tree Snake				
<b>Class Aves - Birds</b>					
<b>Family Anatidae - Ducks, Swans and Geese</b>					
<i>Anas castanea</i>	Chestnut Teal				
<i>Anas gracilis</i>	Grey Teal				
<i>Anas superciliosa</i>	Pacific Black Duck				
<i>Chenonetta jubata</i>	Australian Wood Duck				
<b>Family Columbidae - Pigeons, Doves</b>					
<i>Columba leucomela</i>	White-headed Pigeon				
<i>Geopelia striata</i>	Peaceful Dove				
<i>Leucosarcia melanoleuca</i>	Wonga Pigeon				
<i>Phaps chalcoptera</i>	Common Bronzewing				
<b>Family Podargidae - Frogmouths</b>					
<i>Podargus strigoides</i>	Tawny Frogmouth				
<b>Family Aegotheidae - Owlet Nightjars</b>					
<i>Eurostopodus mystacalis</i>	White-throated Nightjar				
<b>Family Ardeidae - Herons, Egrets and Bitterns</b>					
<i>Egretta novaehollandiae</i>	White-faced Heron				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Family Threskiornithidae - Ibises and Spoonbills</b>					
<i>Threskiornis molucca</i>	Australian White Ibis (Sacred Ibis)				
<b>Family Accipitridae - Osprey, Hawks, Eagles and Harriers</b>					
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	M	+	
<i>Haliastur sphenurus</i>	Whistling Kite				
<b>Family Rallidae</b>					
<i>Porphyrio porphyrio</i>	Purple Swamp Hen				
<b>Family Charadriidae Plover, Dotterels, Lapwings</b>					
<i>Vanellus miles</i>	Masked Lapwing				
<b>Family Cacatuidae - Cockatoos and Corellas</b>					
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo				
<i>Cacatua roseicapilla</i>	Galah				
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo			+	
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V			
<b>Family Psittacidae - Parrots, Rosellas and Lorikeets</b>					
<i>Alisterus scapularis</i>	King Parrot				
<i>Glossopsitta concinna</i>	Musk Lorikeet				
<i>Glossopsitta pusilla</i>	Little Lorikeet	V			
<i>Platycercus eximius</i>	Eastern Rosella				
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet				
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet				



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Family Cuculidae - Cuckoos</b>					
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo				
<i>Eudynamys orientalis</i>	Common Koel				
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo				
<b>Family Halcyonidae - Tree Kingfishers</b>					
<i>Dacelo novaeguineae</i>	Laughing Kookaburra				
<i>Todiramphus sanctus</i>	Sacred Kingfisher				
<b>Family Coraciidae - Rollers 'Dollarbirds</b>					
<i>Eurystomus orientalis</i>	Dollarbird				
<b>Family Climacteridae - Treecreepers</b>					
<i>Cormobates leucophaea</i>	White-throated Treecreeper				
<b>Family Maluridae</b>					
<i>Malurus cyaneus</i>	Superb Fairy-wren				
<b>Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills</b>					
<i>Acanthiza nana</i>	Yellow Thornbill				
<i>Acanthiza pusilla</i>	Brown Thornbill				
<i>Gerygone mouki</i>	Brown Gerygone				
<i>Gerygone olivacea</i>	White-throated Gerygone				
<i>Pardalotus punctatus</i>	Spotted Pardalote				
<i>Sericornis frontalis</i>	White-browed Scrubwren				
<b>Family Meliphagidae - Honeyeaters</b>					
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill				
<i>Anthochaera carunculata</i>	Red Wattlebird				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater				
<i>Manorina melanocephala</i>	Noisy Miner				
<i>Meliphaga lewinii</i>	Lewin's Honeyeater				
<i>Philemon corniculatus</i>	Noisy Friarbird				
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater				
<b>Family Petroicidae - Robins and Jacky Winter</b>					
<i>Eopsaltria australis</i>	Eastern Yellow Robin				
<i>Microeca fascinans</i>	Jacky Winter				
<b>Family Pachycephalidae - Whistlers, Shrike-tit and Shrike-thrushes</b>					
<i>Colluricincla harmonica</i>	Grey Shrike-thrush				
<i>Pachycephala pectoralis</i>	Golden Whistler				
<b>Family Cinclosomatidae - Whipbird and Quail-thrushes</b>					
<i>Psophodes olivaceus</i>	Eastern Whipbird				
<b>Family Monarchidae - Monarchs, Flycatchers and Magpie-Lark</b>					
<i>Grallina cyanoleuca</i>	Magpie-lark				
<b>Family Rhipiduridae - Fantails</b>					
<i>Rhipidura fuliginosa</i>	Grey Fantail				
<i>Rhipidura leucophrys</i>	Willie Wagtail				
<i>Rhipidura rufifrons</i>	Rufous Fantail		M		
<b>Family Campephagidae - Cuckoo-shrikes and Trillers</b>					
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Family Hirundinidae - Swallows and Martins</b>					
<i>Hirundo neoxena</i>	Welcome Swallow				
<b>Family Zosteropidae - White-eyes</b>					
<i>Zosterops lateralis</i>	Silvereye				
<b>Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs</b>					
<i>Cracticus nigrogularis</i>	Pied Butcherbird				
<i>Cracticus tibicen</i> syn. <i>Gymnorhina tibicen</i>	Australian Magpie				
<i>Strepera graculina</i>	Pied Currawong				
<b>Family Corvidae - Crows, Raven</b>					
<i>Corvus coronoides</i>	Australian Raven				
<i>Corvus orru</i>	Torresian Crow				
<b>Family Estrildidae - Grassfinches</b>					
<i>Neochima temporalis</i>	Red-browed Finch				
<b>Class Mammalia - Mammals</b>					
<b>Subclass Prototheria - Monotremes</b>					
<b>Order Monotremata</b>					
<b>Family Tachyglossidae - Echidna</b>					
<i>Tachyglossus aculeatus</i>	Echidna			+	

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Subclass Marsupialia - Marsupials</b>					
<b>Order Dasyuromorphia – Carnivorous Marsupials</b>					
<b>Family Dasyuridae - Dasyurids</b>					
<i>Antechinus stuarti</i>	Brown Antechinus				
<b>Order Diprotodontia</b>					
<b>Suborder Phalangerida</b>					
<b>Superfamily - Petauroidea</b>					
<b>Family Petauridae</b>					
<i>Petaurus norfolcensis</i>	Squirrel Glider	V			
<b>Superfamily - Phalangeroidea</b>					
<b>Family Phalangeridae - Brushtail Possums</b>					
<i>Trichosurus vulpecula</i>	Common Brushtail Possum				
<b>Superfamily - Macropodoidea</b>					
<b>Family Macropodidae - Kangaroos, Wallabies</b>					
<i>Macropus rufogriseus</i>	Red-necked Wallaby			+	
<b>Subclass Eutheria - Eutherian Mammals</b>					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<b>Order Chiroptera</b>					
<b>Suborder Microchiroptera</b>					
<b>Family Molossidae - Freetail-bats</b>					
<i>Austronomus australis</i>	White-striped Freetail Bat				
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V			
<b>Family Vespertilionidae - Plain-nosed Bats</b>					
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				
<i>Miniopterus australis</i>	Little Bentwing-bat	V			
<i>Miniopterus orianae oceanensis</i>	Large Bentwing-bat	V			
<i>Nyctophilus</i> sp.	Long-eared Bat				
<i>Myotis macropus</i>	Large-footed Myotis	V			
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V			
<i>Vespadelus</i> sp.	Forest Bat				
<b>Order Rodentia</b>					
<b>Family Muridae - Rodents</b>					
<i>*Rattus rattus</i>	Black Rat			T	
<b>Order Lagomorpha</b>					
<b>Family Leporidae</b>					
<i>*Lepus capensis</i>	European Hare				
<i>*Oryctolagus cuniculus</i>	European Rabbit			O	
<b>Order Carnivora</b>					
<b>Family Canidae</b>					
<i>*Vulpes vulpes</i>	Red Fox				



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Order Artiodactyla					
Family Cervidae					
* <i>Cervus elaphus</i>	Red Deer				

## **APPENDIX D**

# **KOALA ASSESSMENT REPORT**

# KOALA ASSESSMENT REPORT

for a  
Proposed Extension to the Existing Australian Native Landscapes  
Facility  
at

**Lot 1 DP714149  
Pindimar Road  
TEA GARDENS  
NSW**

**Prepared by:**

**WILDTHING** Environmental Consultants  
38c Stapleton Street  
WALLSEND NSW 2287  
ABN: 41 033 509 215

**For:**

Australian Native Landscapes  
C/o Tattersall Lander Pty. Ltd.  
PO Box 580  
RAYMOND TERRACE NSW 2324

***Job No: 12376***

***June 2020***



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**Acronyms and Abbreviations used in this report**

BC Act	Biodiversity Conservation Act 2016
DA	Development Application
DAWE	Department of Agriculture, Water and Environment
DNG	Derived Native Grassland
DPIE	Department of Planning, Industry and Environment
DoEE	Department of Environment and Energy (now DAWE)
IBRA	Interim Biogeographical Regionalisation of Australia
LGA	Local Government Area
OEH	Office of Environment & Heritage (now DPIE)
PCT	Plant Community Type
SAT	Spot Assessment Technique
SEPP	State Environmental Planning Policy



## **1.0 INTRODUCTION**

This Koala Assessment Report has been prepared for the proponent to inform the preparation of a Development Application (DA) for a proposed extension to the existing Australian Native Landscapes facility at Lot 1 DP 714149 Pindimar Road, Tea Gardens NSW. A location map of the study area has been provided in Figure 1.1.

This assessment forms part of a development application in accordance with State Environmental Planning Policy (Koala Habitat Protection) 2019.

## **1.1 THE PROPOSAL**

The proposed development is for extensions to the existing Australian Native Landscapes facility, including packing sheds, workshop extension, wood waste processing building, silt trap, storage tanks, dam extension and associated works. The proposal involves an extension to the north side of the existing workshop and a wood waste processing extension. No further vegetation clearing is required for these actions. A silt trap is proposed to be installed to the north of the site, collecting runoff from the proposed wood chip mill extension. This action will require vegetation clearing. The development will also involve the construction of two packing sheds on the existing hardstand area to the south east of the development. Further clearing of vegetation is required for this action. An extension to the dam located within the northwest of the site is proposed and will require further vegetation clearing and two storage tanks used for firefighting is proposed to be installed to the north of the site with no vegetation clearing required. Lastly, additional works involving a wetland area further filtering discharge from the proposed silt trap before it enters the dam to the north is proposed and will require further vegetation clearing. Plans for the proposed development have been provided in Figure 1.2.





Author	DH
A4 Scale	1:18000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

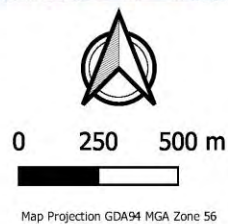


Figure 1.1

**Study Area - Lot 1  
 DP 714149**

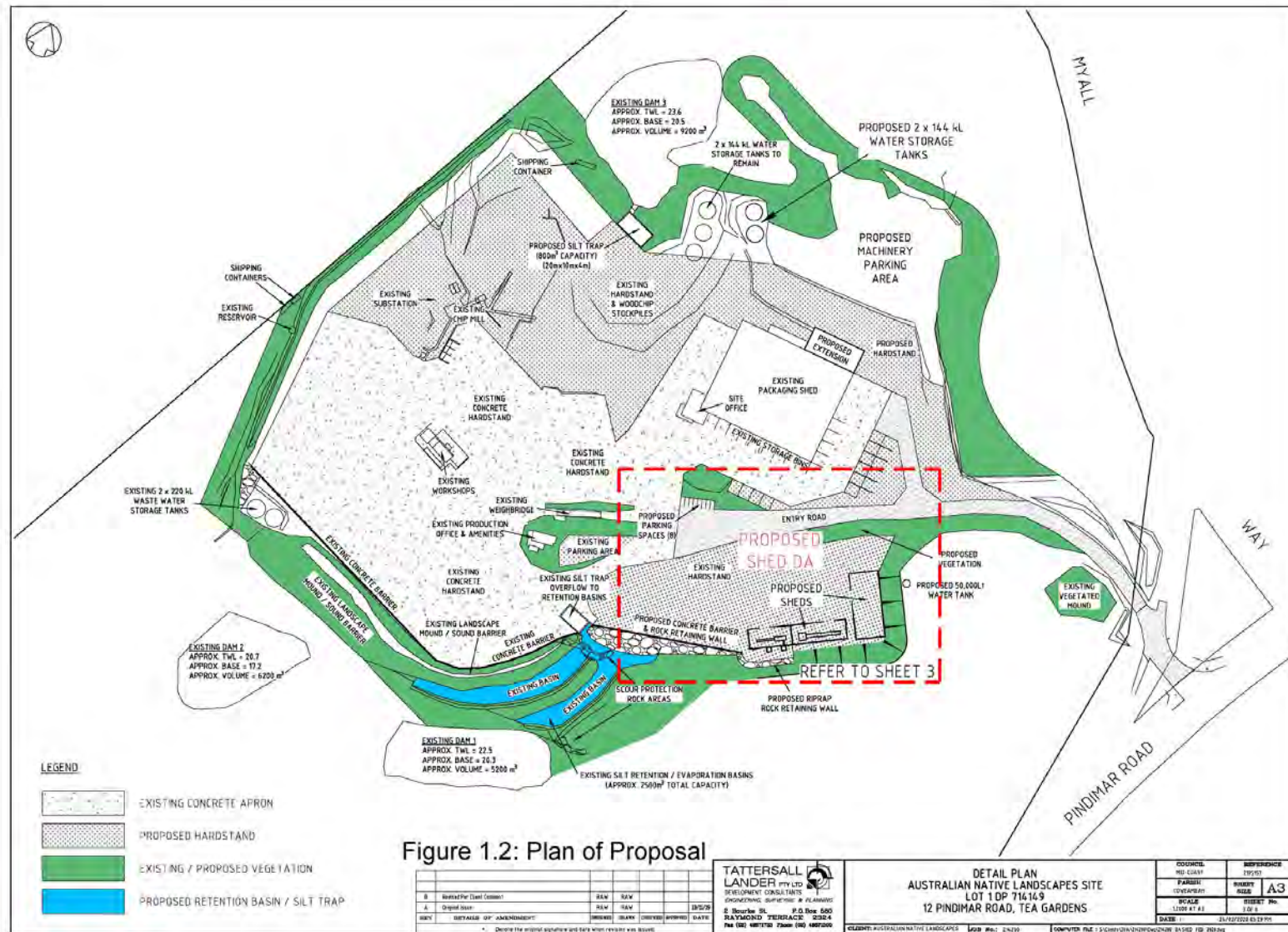
12 Pindimar Road  
 TEA GARDENS, NSW

Aerial Photo  
 Nearmap 11 February 2020

Legend  
 Study Area

**WILDTHING**  
 Environmental Consultants  
 (a Division of Tattersall Lander Pty Ltd)  
 ABN 41 003 509 215





## 2.0 LEGISLATIVE CONTEXT

### 2.1 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2019

The principal aim of State Environment Planning Policy (Koala Habitat Protection) 2019 (SEPP Koala Habitat Protection), is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This Policy applies to each local government area listed in Schedule 1, of which Dungog Shire Council is listed.

Seven key planning principles have been developed to help define the criteria and requirements set out in the SEPP Koala Habitat Protection Guideline. They are:

1. Understand and identify koala habitat values including landscape connectivity (such as habitat extent and habitat linking areas).
2. Avoid inappropriate land uses or intensifying land uses in koala habitat areas through appropriate landscape planning and site selection.
3. Encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas.
4. Minimise potential impacts to koalas and their habitat through design that avoids fragmentation or direct loss of koala habitat, and maintains the function of the koala habitat.
5. Implement best practice measures to manage identified threats to koalas and their habitat (such as those listed in Part 3).
6. Use compensatory (i.e., offsetting) measures only where they can be shown to meet the aim of the SEPP.
7. Use adaptive management strategies to monitor, evaluate and deliver appropriate planning outcomes for koalas in their local setting

#### 2.1.1 APPLYING THE SEPP KOALA HABITAT PROTECTION TO THE PROPOSAL

The site is located within a Schedule 1 council, Mid Coast Council and is larger than 1ha. The site was therefore assessed on the Koala Development Application Map, which mapped the site as containing suitable koala habitat. The site is considered to be in the North Coast Koala Management Area. A total of 13 Schedule 2 Koala Food Trees associated with this region were located within the site. Species included *Allocasuarina torulosa* (Forest Oak), *Angophora floribunda* (Rough-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Corymbia maculata* (Spotted Red Gum), *Eucalyptus fibrosa* (Broad-leaved Red Ironbark), *Eucalyptus globoidea* (White Stringybark), *Eucalyptus moluccana* (Grey Box), *Eucalyptus propinqua* (Small-fruited Grey Gum), *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus siderophloia* (Grey Ironbark), and *Eucalyptus tereticornis* (Forest Red Gum), *Melaleuca quinquenervia* (Broad-leaved Paperbark).

Mid Coast Council does not have a current Koala Plan of Management (KPoM) and is therefore required to be assessed under the Development Assessment Process.

## **2.1.2 DEVELOPMENT ASSESSMENT PROCESS UNDER PART 3**

### **2.1.2.1 Tier 1 - Low or no direct impact development**

The Tier 1 process is for development which can be demonstrated to have low or no direct impact on koalas or koala habitat as follows:

1. indirect impacts that will not result in clearing of native vegetation within koala habitat
2. the development is below the Biodiversity Offsets Scheme threshold under the BC Act
3. there is no native vegetation removal
4. the development footprint will not impede movement between koala habitat
5. adequate mitigation measures such as those listed in Table 1 below are implemented as necessary

The proposal does not meet all criteria under Tier 1 of the Development Assessment Process.

### **2.1.3.2 Tier 2 - Development Applications impacting koalas and/or koala habitat**

Under Tier 2 a Koala Assessment Report has been completed for the proposal.

## **2.2 LICENCING**

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under the NPWS Scientific Investigation Licence SL 100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Director General of NSW Agriculture (File No. TRIM 13/251) for the Fauna Survey for Biodiversity and Impact Assessment.



### **3.0 KOALA HABITAT VALUES**

#### **3.1 THE SITE AREA**

The site is located on the south-western side of the intersection of Pindimar Road and Myall Way approximately 5km north-west of the Tea Gardens CBD (Figure 1.1). The entire site is approximately 44ha in size and currently contains an operational landscaping facility, Australian Native Landscapes. The site is located within the NSW North Coast Bioregion and Karuah Manning Sub-bioregion (regions gazetted by the Minister, or an Interim Biogeographical Regionalisation of Australia (IBRA Bioregion)). The site is also located within the Newcastle Coastal Ramp NSW Landscape and occurs in the Mid Coast Local Government Area (LGA). Three first order prescribed streams and four dams are present within the site. According to the Soil Landscapes of the Port Stephens 1:100 000 Sheet (Murphy, 1993) two soil landscapes the Pindimar Road (pr) and the Nungra (ng) were present within the study area.

#### **3.2 VEGETATION WITHIN THE STUDY AREA**

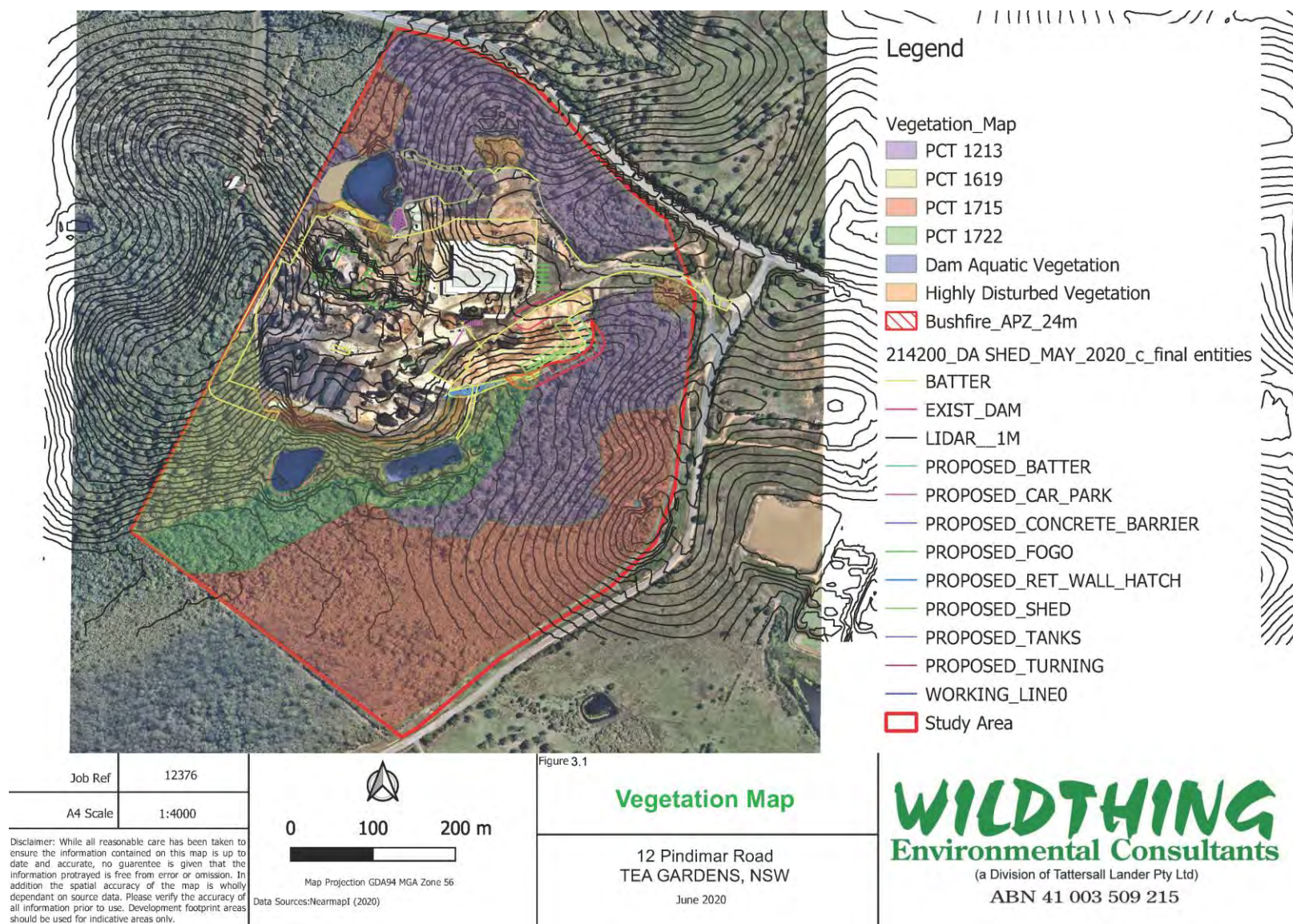
The vegetation of the subject site was stratified by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database, the following PCTs were present within the study area:

- PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion;
- PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands;
- PCT – 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;
- PCT – 1722 - Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast.
- Highly Disturbed Vegetation;
- Aquatic Dam Vegetation.

A detailed vegetation description of each PCT within the site is located within the Ecological Assessment (Wildthing, 2020). Figure 3.1 provides a map of the extent of vegetation within the site.

#### **3.3 THE DEVELOPMENT AREA**

The development area is located within proximity to the existing Australian Native Landscapes facility and will involve expanding the footprint of the facility. Three of the four PCTs located within the site are within the footprint of the proposed development; PCT 1213, PCT 1619 and PCT 1722 (See Figure 3.1).



The proposal will result in the following direct and potential impacts/losses:

- The removal of 0.33ha of PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion
- Modification of 0.08ha of PCT – 1213 - Spotted Gum - Grey Ironbark forest dry open forest of the lower foothills of the Barrington Tops, NSW North Coast Bioregion for a Bushfire APZ;
- The removal of 0.04ha of PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands:
- Modification of 0.04ha of PCT – 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands for a Bushfire APZ.

A total of 0.49ha of vegetation within the site is proposed to be removed or modified.

### **3.4 KOALA SURVEY**

Surveys were conducted within the site to establish the type of Koala habitat present; Core Koala Habitat or Highly Suitable Koala Habitat.

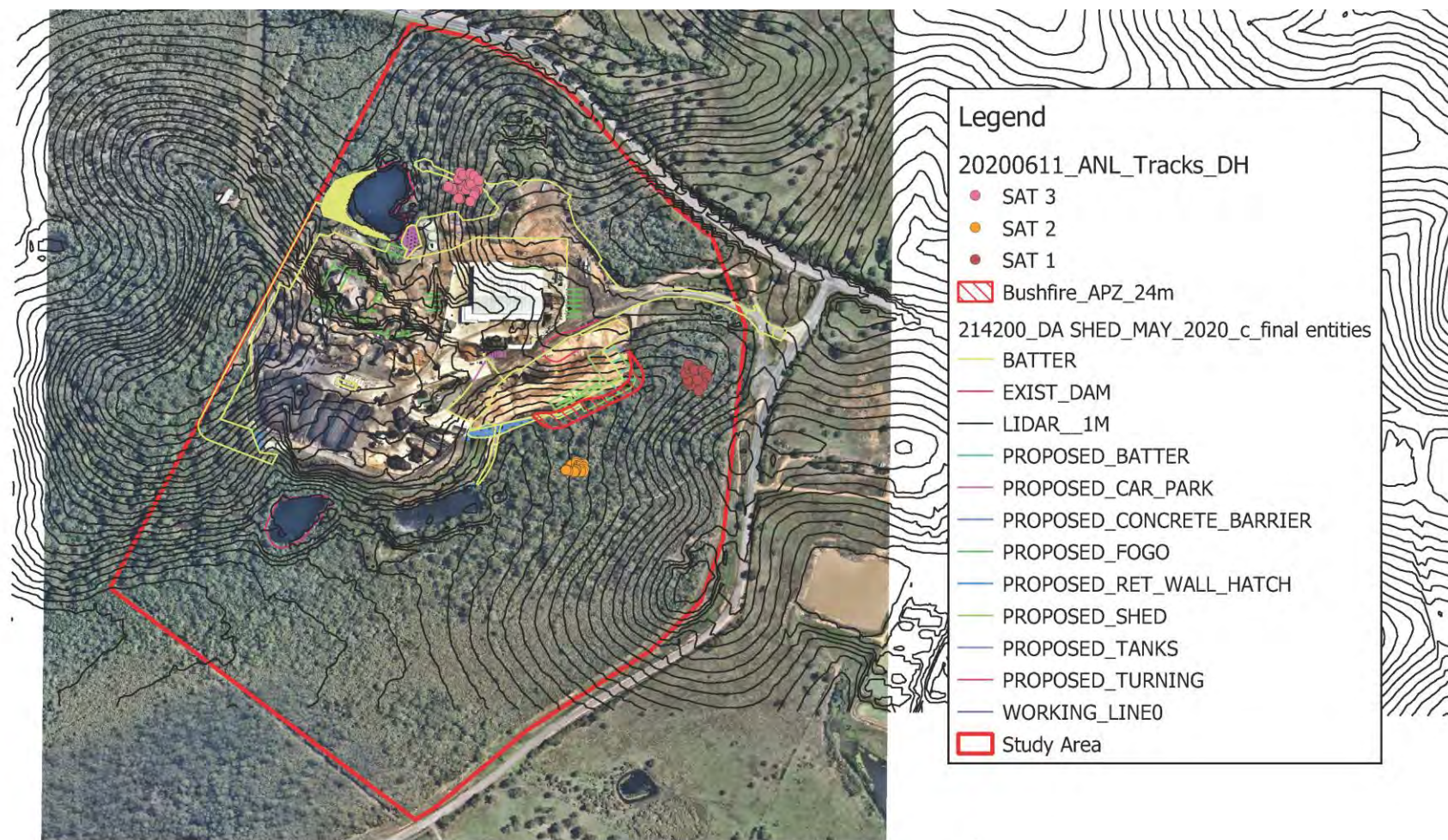
#### **3.4.1 PART A - KOALA PRESENCE**

Koala presence within the site was determined through the Spot Assessment Technique (SAT) and spotlighting. The methodology and results for each survey method is found below:

##### **3.4.1.1 The Spot Assessment Technique (SAT)**

The locations of the SAT assessment is shown in Figure 3.2 and the results are shown in Tables 3.1 - 3.3.





Job Ref	12376
A4 Scale	1:4000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

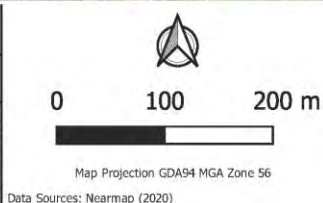


Figure 3.2

### Koala Spot Assessment

12 Pindimar Road  
 TEA GARDENS, NSW

June 2020

**WILDTHING**  
 Environmental Consultants

(a Division of Tattersall Lander Pty Ltd)

ABN 41 003 509 215

Table 3.1: Results of the Spot Assessment Technique (SAT) survey in location 1.

Tree No/Way Point	Easting	Northing	Tree species	DBH	Result
1	416733	6390434	<i>Eucalyptus resinifera</i> Red Mahogany	25,30	No
2	416731	6390434	<i>Melaleuca nodosa</i> Prickly-leaved Paperbark	15	No
3	416729	6390429	<i>Eucalyptus moluccana</i> Grey Box	20	Deer scats
4	416732	6390427	<i>M. nodosa</i>	15	No
5	416733	6390425	<i>Eucalyptus globoidea</i> White Stringybark	15	No
6	416733	6390424	<i>E. moluccana</i>	35	No
7	416735	6390422	<i>Eucalyptus fibrosa</i> Broad-leaved Red Ironbark	25	No
8	416729	6390423	<i>M. nodosa</i>	10	No
9	416726	6390426	<i>M. nodosa</i>	20	No
10	416726	6390428	<i>E. globoidea</i>	15	No
11	416726	6390430	<i>E. globoidea</i>	10	No
12	416723	6390437	<i>E. globoidea</i>	15	No
13	416723	6390439	<i>E. moluccana</i>	30	No
14	416723	6390441	<i>E. globoidea</i>	20	No
15	416724	6390438	<i>E. globoidea</i>	35,15,10	No
16	416729	6390441	<i>E. globoidea</i>	30	No
17	416728	6390444	<i>E. globoidea</i>	15	No
18	416727	6390449	<i>E. globoidea</i>	25	No
19	416732	6390445	<i>E. globoidea</i>	30	No
20	416733	6390444	<i>E. globoidea</i>	10	No
21	416734	6390443	<i>E. globoidea</i>	15	No
22	416742	6390443	<i>E. globoidea</i>	20	No
23	416743	6390442	<i>M. nodosa</i>	15	No
24	416747	6390438	<i>M. nodosa</i>	10,10,10,15	No
25	416747	6390434	<i>M. nodosa</i>	15	No
26	416743	6390427	<i>Pinus radiata</i> Radiata Pine	20	No
27	416743	6390425	<i>P. radiata</i>	20	No
28	416742	6390422	<i>P. radiata</i>	20	No
29	416738	6390416	<i>E. moluccana</i>	25	No
30	416737	6390430	<i>M. nodosa</i>	10	No

Table 3.2: Results of the Spot Assessment Technique (SAT) survey in location 2.

Tree No/Way Point	Easting	Northing	Tree species	DBH	Result
1	416605	6390314	<i>E. resinifera</i>	30	No
2	416605	6390320	<i>Melaleuca lineariifolia</i> Snow-in-Summer	20,25	No
3	416602	6390319	<i>E. resinifera</i>	30	No
4	416600	6390319	<i>P. radiata</i>	30	No
5	416601	6390319	<i>Melaleuca styphelioides</i> Prickly Paperbark	25	No
6	416602	6390321	<i>E. resinifera</i>	35,20	No
7	416607	6390325	<i>M. lineariifolia</i>	25,20	No
8	416607	6390323	<i>M. lineariifolia</i>	15	No
9	416609	6390320	<i>M. lineariifolia</i>	10	No



Tree No/Way Point	Easting	Northing	Tree species	DBH	Result
10	416607	6390317	<i>M. linariifolia</i>	10	No
11	416609	6390318	<i>E. globoidea</i>	25	No
12	416610	6390320	<i>E. globoidea</i>	25	No
13	416615	6390322	<i>M. linariifolia</i>	15	No
14	416612	6390321	<i>Eucalyptus tereticornis</i> Forest Red Gum	15	No
15	416612	6390319	<i>E. globoidea</i>	35	No
16	416615	6390318	<i>M. linariifolia</i>	10	No
17	416616	6390315	<i>M. linariifolia</i>	15	No
18	416616	6390315	<i>Angophora costata</i> Smooth-barked Apple	25	Rabbit scats
19	416612	6390315	<i>E. globoidea</i>	25	No
20	416615	6390312	<i>P. radiata</i>	25	No
21	416612	6390312	<i>P. radiata</i>	20	No
22	416607	6390315	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	15,15,10	No
23	416607	6390314	<i>P. radiata</i>	35	No
24	416606	6390312	<i>M. nodosa</i>	15,20	No
25	416605	6390311	<i>P. radiata</i>	15	No
26	416605	6390312	<i>P. radiata</i>	20	No
27	416597	6390313	<i>P. radiata</i>	15	No
28	416598	6390314	<i>M. styphelioides</i>	20,15	No
29	416598	6390313	<i>E. resinifera</i>	25	No
30	416596	6390314	<i>M. styphelioides</i>	30	No

Table 3.3: Results of the Spot Assessment Technique (SAT) survey in location 3.

Tree No/Way Point	Easting	Northing	Tree species	DBH	Result
1	416480	6390669	<i>E. tereticornis</i>	15	No
2	416481	6390674	<i>Corymbia maculata</i> Spotted Gum	20	No
3	416482	6390675	<i>C. maculata</i>	25,30	No
4	416486	6390670	<i>E. fibrosa</i>	15	No
5	416488	6390676	<i>C. maculata</i>	40	No
6	416490	6390679	<i>C. maculata</i>	30	No
7	416491	6390677	<i>E. resinifera</i>	45	No
8	416498	6390669	<i>C. maculata</i>	30	No
9	416495	6390667	<i>E. fibrosa</i>	25	No
10	416495	6390665	<i>E. resinifera</i>	20,25	No
11	416494	6390663	<i>E. resinifera</i>	10	No
12	416490	6390655	<i>M. styphelioides</i>	20	No
13	416479	6390658	<i>A. costata</i>	20	No
14	416478	6390658	<i>A. costata</i>	10,45	No
15	416477	6390659	<i>Allocasuarina torulosa</i> Forest Oak	10	No
16	416472	6390670	<i>A. torulosa</i>	15	No
17	416471	6390670	<i>E. resinifera</i>	25	No
18	416470	6390672	<i>E. fibrosa</i>	20	No
19	416466	6390672	<i>C. maculata</i>	25	No
20	416465	6390673	<i>C. maculata</i>	15	No
21	416466	6390674	<i>C. maculata</i>	30,25	No
22	416479	6390682	<i>E. fibrosa</i>	45	No

Tree No/Way Point	Easting	Northing	Tree species	DBH	Result
23	416477	6390683	<i>E. fibrosa</i>	40	No
24	416477	6390684	<i>E. resinifera</i>	15,25	No
25	416481	6390688	<i>E. globoidea</i>	10	No
26	416479	6390692	<i>C. maculata</i>	25	No
27	416482	6390689	<i>C. maculata</i>	25	No
28	416490	6390691	<i>E. fibrosa</i>	40	No
29	416494	6390688	<i>Eucalyptus siderophloia</i> Grey Ironbark	35	No
30	416499	6390682	<i>C. maculata</i>	25	No

### Results

The activity level for a SAT site is simply expressed as the percentage equivalent of the proportion of surveyed trees within the site that had Koala faecal pellet recorded within the prescribed search area. Given a sample of 90 trees with no trees having one or more faecal pellets recorded – the resulting activity level would be determined as  $0/90 = 0 = 0$  per cent. The categorisation of Koala activity is shown in Table 3.4.

**Table 3.4. Categorisation of Koala activity into Low, Medium (normal) and High use categories based on use of mean activity level  $\pm$  99 per cent confidence intervals (nearest percentage equivalents) from each of the three area/population density categories.**

Activity category	Low use	Medium (normal) use	High use
Area (density)			
East Coast (low)	-	$\geq 3.33\%$ but $\leq 12.59\%$	$> 12.59\%$
East Coast (med – high)	$< 22.52\%$	$22.52\%$ but $\leq 32.84\%$	$> 32.84\%$
Western Plains (med – high)	$< 35.84\%$	$\geq 35.84\%$ but $\leq 46.72\%$	$> 46.72\%$

Considering the majority of searched trees were Preferred Koala Feed Trees, Koala usage would be very low. This low activity may be associated with low activity levels are also associated with a low-density Koala population.

#### 3.4.1.1 Spotlighting

Spotlighting was undertaken on the 10 June 2020 and the 11 June 2020 following Department of Sustainability, Environment, Water, Population and Communities (DSEWPac), 2011, Survey Guidelines for Australia's Threatened Mammals, comprising:

- At least 2 walking transects of 200 metres per 5 hectares, spaced a minimum of 100m apart, in most likely koala habitat on site.
- At least one transect must be placed in each PCT known to provide habitat for koalas, even if the PCT is less than 100m wide.
- The survey being undertaken at a walking speed of approximately 10m/ per min
- Searches undertaken over 2 consecutive nights.

## Results

No evidence of Koalas was observed during both spotlighting nights.

### **3.4.2 PART B - PRESENCE OF HIGHLY SUITABLE KOALA HABITAT AND KOALA RECORDS**

A total of 13 Schedule 2 Koala Food Trees associated with this region were located within the site (species are listed in Section 2.1.1). There are three PCTs within the development footprint, with all three PCTs containing greater than 15% Schedule 2 Koala Food Trees.

Bionet Koala Records spanning the previous 18 years within a 2.5km radius of the site were considered and shown in Table 3.5 (DPIE, 2020). A total of 6 records were available.

**Table 3.5: Koala records within 2.5km of the site from the past 18 years (DPIE, 2020).**

Date	Distance from Site (Approximate km)	Details
10/10/2018	1.24	Mother and joey run over roughly 1km NE of Myall Way and Pacific Highway junction along Pacific Highway in southbound lane
04/12/2017	1.91	Pacific Highway 2-3km north of Myall Way, Tea Gardens
27/07/2017	1.97	Pacific Highway, Tea Gardens
05/10/2006	1.25	Crossing Pacific Highway 2-3km north of Tea Gardens turnoff
26/01/2006	1.83	Pacific Highway near Tea Gardens turnoff - walking along side of road
21/01/2004	1.6	Vegetated lands 400m north of existing Tea Gardens turnoff and Pacific Highway (Bundebah Creek)

### **3.5 KOALA HABITAT VALUE OF THE SITE**

The site is considered to contain highly suitable koala habitat given the density of Koala Food Trees listed under Schedule 2 of the SEPP and records within contiguous habitat within 2.5km of the site, but lack of koala presence observed during targeted surveys. Koala surveys undertaken within the site and low number of records within the vicinity of the site indicate koalas would utilise the site infrequently.

#### **4.0 MEASURES TAKEN TO AVOID IMPACTS TO KOALAS**

##### **4.1 SITE SELECTION PROCESS**

The site is currently operating as a commercial landscaping facility. The proposed additions to the facility have been located to efficiently enhance operations of the expanding facility whilst taking environmental values of the site into consideration. The proposed additions to the facility have been positioned within close proximity to the already established facility to minimise the footprint on the surrounding vegetation within the site.

##### **4.2 HOW THE PROPOSAL WILL AVOID OR MINIMISE DIRECT IMPACTS TO KOALA HABITAT**

Avoidance measures will include the following:

- all material stockpiles, vehicle parking and machinery storage will be located within already cleared areas, and not in areas of native vegetation that are to be retained;
- implementation of stormwater controls during construction to ensure that discharges outside the development footprint are consistent with existing conditions and do not impact the streams located within the site; and
- erosion and sediment controls (e.g. silt fences, sediment traps) will be installed prior to construction to avoid disturbance and degradation of soils and nearby features (e.g. water ways, adjacent habitat and vegetation). These should conform to the specifications in Soils and Construction 'Blue Book' (Landcom, 2004) and should be maintained throughout the construction process until soil is successfully stabilised.

Minimising measures will include the following:

- Tree clearing and disturbance will be limited to the development site;
- All trees requiring removal will be clearly marked;
- where a tree must be disturbed the priority will be given to pruning rather than clearing;
- the clearing of any trees will be undertaken in a manner that avoids damaging adjacent vegetation i.e. all trees should be felled into disturbed areas when feasible.

#### **5.0 ANALYSIS OF POTENTIAL IMPACTS**

##### **5.1 RESIDUAL DIRECT IMPACTS TO KOALAS AND KOALA HABITAT**

The proposed development has the potential to result in inadvertent impacts on adjacent retained habitat or vegetation. The proposal will likely result in an increase in edge effects impacting upon retained vegetation patches as it will result in new environmental conditions to develop along the edges of cleared environments. It is considered that establishment of weeds and modification of habitat attributes (i.e. noise and water runoff) are the most likely tangible impacts that may arise from the proposal. Such conditions often result in the simplification of biodiversity values. However, the mitigation measures described above will minimise the likelihood of occurrence of this indirect impact during the construction phase of the project.

## **5.2 POTENTIAL INDIRECT IMPACTS TO KOALAS AND KOALA HABITAT**

Indirect impacts as a result of the proposal have been identified as increased risk of vehicle strike and disturbance to Koala Food Trees within the site. Proposed mitigating measures include low speed limits within the facility and the root zone of any retained Koala Food Tree should not be compromised, including no sediment piled up on the root zone of any retained trees.

## **6.0 PLAN TO MANAGE AND PROTECT KOALAS AND THEIR HABITAT**

### **6.1 MEASURES TO MANAGE DIRECT AND INDIRECT IMPACTS**

A number of best practice management measures are proposed to minimise risk to koalas and their habitat as a result of the proposal. During construction, the development footprint should be clearly marked to prevent disturbance to remaining habitat. The root zone of any retained Koala Food Tree should not be compromised, including no sediment piled up on the root zone of any retained trees.

### **6.2 COMPENSATORY MEASURES**

The extent of the development will be restricted to the designated footprint. During construction, the development footprint should be clearly marked to prevent disturbance to remaining habitat. Koala Food Trees located outside of the development footprint are to be retained and enhanced through control of weeds within the site.

### **6.3 MONITORING, ADAPTIVE MANAGEMENT AND REPORTING**

If a Koala is observed within the site during clearing for the development then a 100m radius exclusion zone is to be implemented and a spotter to be stationed observing the koala's movements. No other monitoring or reporting measures are considered appropriate for this proposal.

## **7.0 CONCLUSION**

The proposed extension to the Australian Native Landscapes facility will result in an incremental reduction/modification of habitat within the local area. However, provided the recommendations in this report are implemented the proposal is unlikely to have a significant impact and area of habitat important to the long-term survival of the Koala. To avoid and minimise potential impacts of the proposal on koalas and their habitat, a series of mitigation and management measures have been identified and detailed within this report.



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## APPENDIX M – BUSHFIRE RISK ASSESSMENT



## **BUSH FIRE RISK ASSESSMENT**

***LOT 1 in DP 714149***

***12 PINDIMAR ROAD  
TEA GARDENS***

***PREPARED BY  
TATTERSALL LANDER  
PTY LTD  
DEVELOPMENT CONSULTANTS  
March 2024***

**DEVELOPMENT CONSULTANTS IN ENGINEERING, SURVEYING, PLANNING & ENVIRONMENTAL**

Liability limited by a scheme approved under Professional Standards Legislation.

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S:\Clients\2014\214200\Correspondence\214200-R001006 Bush Fire Assessment 2024 (March).docxx



## *Executive Summary*

This Bush Fire Risk Assessment has been prepared to accompany a Development Application for a proposed change of use to part of an existing development at 12 Pindimar Road, Tea Gardens, in the Midcoast Local Government Area – the property being identified as Lot 1 in DP 714149.

The proposal is for a change of use and internal configurations to allow for a green waste processing facility as opposed to purely wood waste processing. There is no increase in development footprint or reduction in existing APZs proposed.

It is concluded that the proposal will meet the aim and objectives of *Planning for Bushfire Protection (PBP)* and is therefore acceptable with no Bushfire Attack Level (BAL) construction requirements.



## 1.0 INTRODUCTION

Tattersall Lander Pty Ltd has been commissioned to undertake a Bushfire Threat Assessment for a proposed development at 12 Pindimar Road, Tea Gardens – the property is identified as Lot 1 in DP 714149. This Bushfire Hazard Assessment is based upon the guidelines as defined in the document, *Planning for Bushfire Protection Guidelines 2019* (identified as *PBP* in this document), which has been written by the *NSW Rural Fire Service*. This assessment outlines the risk posed from bush fire, and hence defines the constraints placed upon the proposed development.

This report has been prepared by myself (Ben Folbigg); I have a Diploma in Planning for Bushfire Protection and am Bushfire Planning and Design (BPAD) accredited (Level 2) with the Fire Protection Association (FPA) Australia (BPAD31379).

## 2.0 METHODOLOGY

This assessment is conducted entirely in accordance with the guidelines, as outlined in *PBP*.

This assessment:

- identifies the slope and aspect of the property;
- identifies all vegetation categories within 140 metres of the site;
- determines the Bushfire Attack Category which applies to the site;
- identifies Asset Protection Zones/Setbacks;
- identifies the Bushfire Construction level required in relation to the above for the proposed development (AS 3959)

The proposal is assessed to ensure compliance with the Aim and objectives of *PBP*

*The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*

This aim is achieved through the objectives which include:

- *afford buildings and their occupants protection from exposure to a bush fire.*
- *provide for a defensible space to be located around buildings.*
- *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.*
- *ensure that appropriate operational access and egress for*

- emergency service personnel and occupants is available.*
- *provide for ongoing management and maintenance of BPMs.*
- *ensure that utility services are adequate to meet the needs of firefighters.*

It is specifically noted that this report is to be read in conjunction with the report which was prepared in June 2020; the previous report was prepared for a Development application for additions and alterations to an existing facility including a proposed extension to the wood waste processing facility in the north western part of the site, the construction of two additional sheds in the south and south eastern part of the facility, and an extension to the centrally located shed. It is also noted that this proposal, either now or previously, does not contain any habitable structure.

### **3.0 SITE DESCRIPTION**

The subject site is a large rural site with an area of approximately 44.5 hectares. Within the site there is an approved log processing and woodchip operation, as well as a maintenance shed, managers dwelling and associated infrastructure. There are currently three fire fighting water tanks on site, each with a capacity of 144 thousand litres and Storz fitting such that they are compliant with *PBP* requirements. There are also three existing dams on the site with an estimated capacity of 9.2ML (located at the northern part of the development, 6.2ML (located at the southwestern part of the development) and 5.2ML (located at the southern part of the development).

There are cleared areas on the site which are utilised for the existing operations and also heavily vegetated areas which surround and are outside of the existing area of operations.

Surrounding sites consist of a mixture of vegetated lands and cleared lands which are used for rural uses, including dwellings which are located on the rural properties.

An aerial photograph of the site and the surrounding area have been provided in Appendix A and photographs of the site surrounds are provided in Appendix B; the approximate location and direction in which these photographs have been taken are included on the aerial photograph.

The site is located in the Midcoast Local Government Area and hence is afforded a Fire Danger Index (FDI) rating of 80.



## **6.0 SITE ANALYSIS**

### **6.1 Northern Aspect**

The northern aspect presents vegetation in the form of forest and there is an effective slope under vegetation in the flat/upslope category.

The separation distance between the development, including the proposed components (but excluding the water tanks) is approximately 29 metres at the minimum.

### **6.2 Southern Aspect**

The southern aspect presents vegetation in the form of forest. The slope under this forest is variable and with a worst case in the >5-10 category.

The separation distance between the development, including the proposed components, is currently 18 metres at the minimum.

### **6.3 Eastern Aspect**

The eastern aspect presents vegetation in the form of forest and an effective slope under this vegetation in the upslope/flat category.

The separation distance between the development, including the proposed components, and this vegetation is variable but currently 13 metres at the minimum.

### **6.4 Western Aspect**

The western aspect presents vegetation in the form of forest and the effective slope under this vegetation, whilst variable, has a worst case of >5-10 degrees.

The separation distance between the development, including the proposed components, is approximately 29 metres at the minimum.

## 7.0 SITE ANALYSIS

Aspect	Vegetation Classification	Slope (degrees) under vegetation	Required Minimum/Existing Asset Protection Zone (metres)	Bushfire Attack Category
North	Forest	Flat/upslope	15	BAL-40
South	Forest	>5-10	24	BAL-40
East	Forest	Flat/upslope	15	BAL-40
West	Forest	>5-10	29	BAL-40

**Table 1 – Minimum Asset Protection Zones and Construction Level Requirements as per *Planning for Bushfire Protection 2019***

**NB:** Given the proposal is not for a habitable building, there is no construction level required and this is only provided to demonstrate that the development is not located in Flame Zone (BAL-FZ)



## **8.0 UTILITIES**

### **8.1 Water Supply**

The subject site is not connected to the reticulated town water supply. In order to facilitate fire fighting, there are three large dams, with estimated capacities of 9.2ML, 6.2ML, and 5.2ML. In addition there are three existing fire fighting water tanks, each with a capacity of 144,000 litres and there is a proposal to install two more similar tanks. These tanks are compliant with *PBP*. The only notable point is that there are PVC pipes which are above ground, however, these pipes are only filling pipes and their failure will not compromise the ability of these tanks for fire fighting purposes and as such this should be considered acceptable.

The existing water supply is considered adequate and compliant with *PBP*.

### **8.2 Electrical Supply**

The electrical supply within the site is all underground and is therefore not a bush fire ignition risk and is compliant with *PBP*.

### **8.3 Gas Supply**

There is no gas provided to the site and no gas is proposed. This is acceptable.

## **9.0 ACCESS**

### **9.1 Road Capacity**

The subject site is accessed via Pindimar Road which runs off Myall Way. The access road is existing and is therefore considered acceptable. It is noted that the access road and areas adjacent to this access, are well maintained to ensure appropriate access and egress in the event of a bush fire.

The capacity of Pindimar Road has not been checked, however, it may be safely assumed that it is adequate for the purpose of carrying fully laden fire fighting vehicles, including tankers.

### **9.2 Road Linkages to Fire Trails**

There are no official fire trails on the site and given the proximity of the operations to Pindimar Road, no fire trails are considered necessary. It is noted that the plan does identify fire trails within the site and in reality, whilst unofficial, these are all weather tracks which are of sufficient width and with sufficient vertical clearance for use in the event of a bush fire.

### **9.3 Emergency Egress**

In the event of a bush fire emergency, evacuation would be via the access road, onto Pindimar Road and then presumably Myall Way. Whilst the access road is significantly greater than the stipulated maximum 200-metres, it is noted that the development is existing and this proposal will not result in any intensification in the use of the development and therefore the existing access must be considered acceptable.

## **10.0 DISCUSSION and RECOMMENDATIONS**

The proposal in its current form will not require the removal of any vegetation, nor will it include any increase in the development footprint or reduction of existing asset protection zones.

The proposal will not result in any increase in risk to occupants of the site or emergency service personnel relating to bush fire hazard.

Given the fact that the proposal does not include any form of habitable structure, the assessment of this proposal simply needs to ensure compliance with the aim and objectives of *PBP 2019* and there is no requirement for any construction to a BAL standard.

The aim of *PBP 2019* is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment. This aim is deemed to be met by meeting the objectives which are to:

- *Afford buildings and their occupants protection from exposure to a bush fire;*

**Comment** – There is an adequate APZ in place and the construction of the building is non-flammable and as such it is deemed that the building and its occupants are provided adequate protection from exposure to bush fire. It is also noted that the development will in no way result in any reduction in this existing protection. It is considered that the proposal is consistent with this objective.

- *Provide for a defensible space to be located around buildings;*

**Comment** – The existing asset protection zone is considered to be an acceptable defensible space. In addition, it is noted that this asset protection zone has not been reduced as a result of this proposal as compared to that as previously approved. This objective is considered to be met.

- *Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to building;*

**Comment** – The existing asset protection zone is considered to be appropriate separation and the well managed nature of the development is considered to be one of the appropriate other measures which shall help prevent the likely spread of fire. The development as proposed will in no way alter the existing and approved situation in this regard and this objective is considered to be met.

- *Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*

**Comment** – The existing access is significantly wider than the minimum requirements and therefore, whilst it is significantly longer, it is existing and is to be considered acceptable. The proposal will in no way alter the operational access and egress for the site. The proposal is considered to meet this objective.

- *Provide for ongoing management and maintenance of BPMs;*

**Comment** – There is excellent and ongoing management of the site and this objective is met.

- *Ensure that utility services are adequate to meet the needs of fire fighters.*

**Comment** – There is a significant water supply which is located such that this objective is met.

The requirements under *PBP* for developments of this nature also include:

- *to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*

**Comment** – The managed nature of the site, including the especially well managed nature of the access is considered to provide safe access and egress in the event of a bush fire. Then proposal is compliant in this regard

- *to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;*

**Comment** – The site has an emergency management plan in place for events such as bush fire and this ensures compliance in this regard.

- *to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building;*

**Comment** – The water supply is acceptable for bush fire fighting purposes; the electrical supply is located so that it is not a hazard; there is no gas supply. The proposal is compliant in this regard.

- *to provide for the storage of hazardous materials away from the hazard wherever possible.*

**Comment** – The nature of the business is that there are flammable materials stored within the site (e.g. timber waste products). The location of such storage areas has been sited to ensure there is sufficient distance from bushfire hazards and also so that in the event of a bush fire, it will not result in any potential obstruction for

access to or egress from the site. Where materials are stored in sheds near the edge of the development, the sides of the sheds facing the hazard are closed and all apertures greater than 2mm are to be adequately screened. The proposal is compliant in this regard.

In addition to meeting the above requirements, it is noted that all parts of the development, and especially of the proposal, are located outside of BAL-FZ and therefore outside of Flame Zone and this will assist in the prevention of fire spread from any potential bush fire to within the site.

## **11.0 CONCLUSION**

The proposal is for an alteration to the existing use of a shed at 12 Pindimar Road, Tea Gardens (Lot 1 in DP 714149).

The proposal has been assessed as per the NSW Rural Fire Service *Planning for Bushfire Protection Guidelines* (2019) and the proposal is considered fully compliant. The proposal will in no way result in any increase in risk relating to bush fire.

## **12.0 DISCLAIMER**

All effort has been made to ensure the accuracy of this report, however, it is noted that Bushfires can be unpredictable and this report in no way implies that any part of the proposed development is totally safe from fire.

Additionally it is noted that despite the site details at the time of writing this report, the situation may change; factors resulting in change to Bushfire Hazard include (but are not limited to) vegetation regrowth and improper maintenance of Asset Protection Zones.

No responsibility is accepted or implied for damage to, or loss of, life and/or property at any time resulting from Bushfire or Bushfire related issues (or any other factors) on this site.



## Appendix A: Aerial Photograph



## Appendix B:

### Photographs





Photograph 1



Photograph 2





Photograph 3



Photograph 4





Photograph 5



Photograph 6





Photograph 7



Photograph 8





Photograph 9



Photograph 10





Photograph 11



Photograph 12





Photograph 13



Photograph 14

## Appendix C:

### 2020 Bushfire Risk Assessment





## **BUSHFIRE RISK ASSESSMENT**

***LOT 1 in DP 714149***

***12 PINDIMAR ROAD  
TEA GARDENS***

***PREPARED BY  
TATTERSALL LANDER  
PTY LTD  
DEVELOPMENT CONSULTANTS  
April 2020***

DEVELOPMENT CONSULTANTS IN ENGINEERING, SURVEYING, PLANNING & ENVIRONMENTAL



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[www.tatland.com.au](http://www.tatland.com.au)

S:\Clients\2014\214200\Correspondence\214200-R001005 Bush Fire Assessment 2020 (JUNE).docxx

## *Executive Summary*

This Bush Fire Hazard Assessment has been prepared to provide direction for a proposed development at 12 Pindimar Road, Tea Gardens, in the Midcoast Local Government Area – the property being identified as Lot 1 in DP 714149. This development is captured under Section 79BA of the *Environmental Planning and Assessment Act* (1979) with Midcoast Council being the determining authority.

The proposal is for extensions to an existing wood waste processing facility and also for additional sheds and fire fighting water tanks.

It is concluded that, subject to minimal clearing of vegetation, the proposal will meet the aim and objectives of *PBP* and is therefore acceptable with no BAL construction requirements. The proposed sheds to be located in the south of the site shall to ensure all apertures greater than 2mm on the south and eastern sides are adequately sealed.

## 1.0 INTRODUCTION

Tattersall Lander Pty Ltd has been commissioned to undertake a Bushfire Threat Assessment for a proposed development at 12 Pindimar Road, Tea Gardens – the property is identified as Lot 1 in DP 714149. This Bushfire Hazard Assessment is based upon the guidelines as defined in the document, *Planning for Bushfire Protection Guidelines 2019* (identified as *PBP* in this document), which has been written by the *NSW Rural Fire Service*. This assessment outlines the risk posed from bush fire, and hence defines the constraints placed upon the proposed development.

This report has been prepared by myself (Ben Folbigg); I have a Diploma in Planning for Bushfire Protection and am BPAD accredited (Level 2) with the FPA Australia (BPAD31379).

## 2.0 METHODOLOGY

This assessment is conducted entirely in accordance with the guidelines, as outlined in *PBP*.

This assessment:

- identifies the slope and aspect of the property;
- identifies all vegetation categories within 140 metres of the site;
- determines the Bushfire Attack Category which applies to the site;
- identifies Asset Protection Zones/Setbacks;
- identifies the Bushfire Construction level required in relation to the above for the proposed development (AS 3959)

The proposal is assessed to ensure compliance with the Aim and objectives of *PBP*

*The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*

This aim is achieved through the objectives which include:

- afford buildings and their occupants protection from exposure to a bush fire.
- Provide for a defensible space to be located around buildings.
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- Ensure that appropriate operational access and egress for

- emergency service personnel and occupants is available.
- Provide for ongoing management and maintenance of BPMs.
- Ensure that utility services are adequate to meet the needs of firefighters.

### 3.0 SITE DESCRIPTION

The subjects it is a large rural site with an area of approximately 44.5 hectares. Within the site there is an approved log processing and woodchip operation, as well as a maintenance shed, managers dwelling and associated infrastructure. There are currently three fire fighting water tanks on site, each with a capacity of 144 thousand litres and Storz fitting such that they are compliant with *PBP* requirements. There are also three existing dams on the site with estimated capacity of 9.2ML (located at the northern part of the development, 6.2ML (located at the south western part of the development) and 5.2ML (located at the southern part of the development).

There are cleared areas on the site which are utilised for the existing operations and also heavily vegetated areas which surround and are outside of the existing area of operations.

Surrounding sites consist of a mixture of vegetated lands and cleared lands which are used for rural uses, including dwellings which are located on the rural properties.

An aerial photograph of the site and the surrounding area have been provided in Appendix A and photographs of the site surrounds are provided in Appendix B; the approximate location and direction in which these photographs have been taken are included on the aerial photograph.

The site is located in the Midcoast Local Government Area and hence is afforded a Fire Danger Index (FDI) rating of 80.

### 4.0 THE PROPOSAL

The proposed development is for additions to the existing facility, including a proposed extension to the wood waste processing facility in the north western part of the site, the construction of two additional sheds in the south and south eastern part of the facility, and an extension to the centrally located shed. A site plan showing the facility and the proposed locations of the works has been included in the appendices.

It is specifically noted that this proposal does not include a dwelling or any other habitable building. It is also noted that the sheds are constructed from non-combustible materials, including concrete panelling and metal sheeting/Colorbond products.

## **5.0 LEGISLATION**

Midcoast Council is the determining authority under Section 4.14 of the *Environmental Planning and Assessment Act 1979*.

## **6.0 SITE ANALYSIS**

### **6.1 Northern Aspect**

The northern aspect presents vegetation in the form of forest and there is an effective slope under vegetation in the flat/upslope category.

The separation distance between the development, including the proposed components (but excluding the water tanks) is approximately 29 metres at the minimum.

### **6.2 Southern Aspect**

The southern aspect presents vegetation in the form of forest. The slope under this forest is variable and with a worst case in the >5-10 category.

The separation distance between the development, including the proposed components, is currently 18 metres at the minimum.

### **6.3 Eastern Aspect**

The eastern aspect presents vegetation in the form of forest and an effective slope under this vegetation in the upslope/flat category.

The separation distance between the development, including the proposed components, and this vegetation is variable but currently 13 metres at the minimum.



#### **6.4 Western Aspect**

The western aspect presents vegetation in the form of forest and the effective slope under this vegetation, whilst variable, has a worst case of >5-10 degrees.

The separation distance between the development, including the proposed components, is approximately 29 metres at the minimum.

## 7.0 SITE ANALYSIS

Aspect	Vegetation Classification	Slope (degrees) under vegetation	Existing Minimum Asset Protection Zone (metres)	Bushfire Attack Category and Construction Standard (AS3959)	Required Minimum APZ (metres)	Bushfire Attack Category
North	Forest	Flat/upslope	29	BAL-19	15	BAL-40
South	Forest	>5-10	18	BAL-FZ	24	BAL-40
East	Forest	Flat/upslope	13	BAL-FZ	15	BAL-40
West	Forest	>5-10	29	BAL-40	24	BAL-40

**Table 1 – Minimum Asset Protection Zones and Construction Level Requirements as per *Planning for Bushfire Protection 2019***

**NB:** Given the proposal is not for a habitable building, there is no construction level required and this is only provided to demonstrate that the development is not located in Flame Zone (BAL-FZ)

## **6.0 UTILITIES**

### **6.1 Water Supply**

The subject site is not connected to the reticulated town water supply. In order to facilitate fire fighting, there are three large dams, with estimated capacities of 9.2ML, 6.2ML, and 5.2ML. In addition there are three existing fire fighting water tanks, each with a capacity of 144,000 litres and there is a proposal to install two more similar tanks. These tanks are compliant with *PBP*. The only notable point is that there are PVC pipes which are above ground, however, these pipes are only filling pipes and their failure will not compromise the ability of these tanks for fire fighting purposes and as such this should be considered acceptable.

Water supply is considered adequate and compliant with *PBP*.

### **6.2 Electrical Supply**

Electrical supply within the site is all underground and is therefore not a bush fire ignition risk and is compliant with *PBP*.

### **6.3 Gas Supply**

There is no gas provided to the site and no gas is proposed. This is acceptable.

## **7.0 ACCESS**

### **7.1 Road Capacity**

The subject site is accessed via Pindimar Road which comes off Myall Way. The access road is existing and is therefore considered acceptable. It is noted that the access road and areas adjacent to this access, are well maintained to ensure appropriate access and egress in the event of a bush fire.

The capacity of Pindimar Road has not been checked, however, it may be safely assumed that it is adequate for the purpose of carrying fully laden fire fighting vehicles, including tankers.

### **7.2 Road Linkages to Fire Trails**

There are no official fire trails on the site and given the proximity of the operations to Pindimar Road, no fire trails are considered necessary. It is

noted that the plan does identify fire trails within the site and in reality, whilst unofficial, these are all weather tracks which are of sufficient width and with sufficient vertical clearance for use in the event of a bush fire.

### **7.3 Emergency Egress**

In the event of a bush fire emergency, evacuation would be via the access road, onto Pindimar Road and then presumably Myall Way.

## **8.0 DISCUSSION and RECOMMENDATIONS**

The proposal in its current form will require the clearing of an additional 6 metres of vegetation to the south and an additional 2 metres of vegetation to the east. Based on this clearing being undertaken, then the proposal is considered acceptable from a bushfire threat perspective and the following notes in this section will be appropriate and accurate.

Given the fact that the proposal does not include any form of habitable structure, the assessment of this proposal simply needs to ensure compliance with the aim and objectives of *PBP* and there is no requirement for any construction to a BAL standard.

The requirements under *PBP* for developments of this nature include:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;

**Comment** – The managed nature of the site, including the especially well managed nature of the access is considered to provide safe access and egress in the event of a bush fire. Then proposal is compliant in this regard

- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;

**Comment** – The site has an emergency management plan in place for events such as bush fire and this ensures compliance in this regard.

- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building;

**Comment** – The water supply is acceptable for bush fire fighting purposes; electrical supply is located so that it is not a hazard; there is no gas supply. The proposal is compliant in this regard.

- to provide for the storage of hazardous materials away from the hazard wherever possible.

**Comment** – The nature of the business is that there are flammable materials stored within the site (eg timber waste product). The location of such storage areas has been sited to ensure there is sufficient distance from hazard and also so that in the event of a bush fire, it will not result in any potential obstruction for access to or egress from the site. Where materials are stored in sheds near the edge of the development, the sides of the sheds facing the hazard are closed and all apertures greater than 2mm are to be adequately screened. The proposal is compliant in this regard.

In addition to meeting the above requirements, it is noted that all parts of the development, and especially of the proposal, are located outside of BAL-FZ and therefore outside of Flame Zone and this will assist in the prevention of fire spread from any potential bush fire to within the site.

There is no requirement to construct the proposal to any BAL, however, all south and east facing walls on the proposed sheds in the southern part of the site are to include adequate screening on all apertures greater than 2mm in width.

## 9.0 CONCLUSION

The proposal is for additions to an existing at 12 Pindimar Road, Tea Gardens (Lot 1 in DP 714149).

The proposal has been assessed as per the NSW Rural Fire Service *Planning for Bushfire Protection Guidelines* (2019) and the proposal is considered compliant based on minimal additional vegetation clearing.

## 10.0 DISCLAIMER

All effort has been made to ensure the accuracy of this report, however, it is noted that Bushfires can be unpredictable and this report in no way implies that any part of the proposed development is totally safe from fire.

Additionally it is noted that despite the site details at the time of writing this report, the situation may change; factors resulting in change to



Bushfire Hazard include (but are not limited to) vegetation regrowth and improper maintenance of Asset protection Zones.

No responsibility is accepted or implied for damage to, or loss of, life and/or property at any time resulting from Bushfire or Bushfire related issues (or any other factors) on this site.

## Appendix A: Aerial photograph



## Appendix B:

### Photographs





Photograph 1



Photograph 4





Photograph 7



Photograph 10





Photograph 13



Photograph 16





Photograph 18



Photograph 22





Photograph 25



Photograph 28





Photograph 31



Photograph 34





Photograph 37



Photograph 38



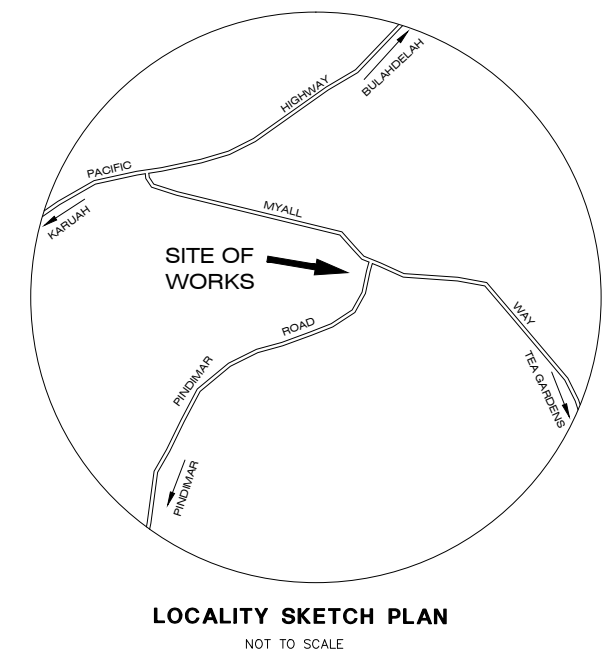
## Appendix C:

### Plans

# PROPOSED PACKAGING SHEDS, WORKSHOP EXTENSION, WOOD WASTE PROCESSING BUILDING, SILT TRAP, STORAGE TANKS, DAM EXTENSION & ASSOCIATED WORKS

## AUSTRALIAN NATIVE LANDSCAPES SITE PINDIMAR ROAD, TEA GARDENS LOT 1, DP 714149

Sheet List Table			
Sheet Number	File	Sheet Description	Revision
1	2195155	TITLE PAGE, LOCALITY SKETCH & SCHEDULE OF DRAWINGS	G
2	2195156	SITE LAYOUT PLAN	G
3	2195157	SITE DETAIL PLAN	G
4	2195158	PACKAGING SHED DETAIL PLAN	G
5	2195159	WOODWASTE PROCESSING DETAIL PLAN	G
6	2195160	WORKSHOP EXTENSION DETAIL PLAN	G
7	2195161	CATCHMENT PLAN	G
8	2195162	DRAINAGE CONCEPT SITE PLAN	G
9	2195163	PACKAGING SHED DRAINAGE DETAIL PLAN	G



Designed By

**TATTERSALL LANDER** PTY. LTD.  
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PO Box 580 RAYMOND TERRACE Phone (02) 4987 1500





G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
E	Revised Per Client Comment	RAW	RAW			14/05/20
D	Revised Per Client Comment	RAW	RAW			08/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

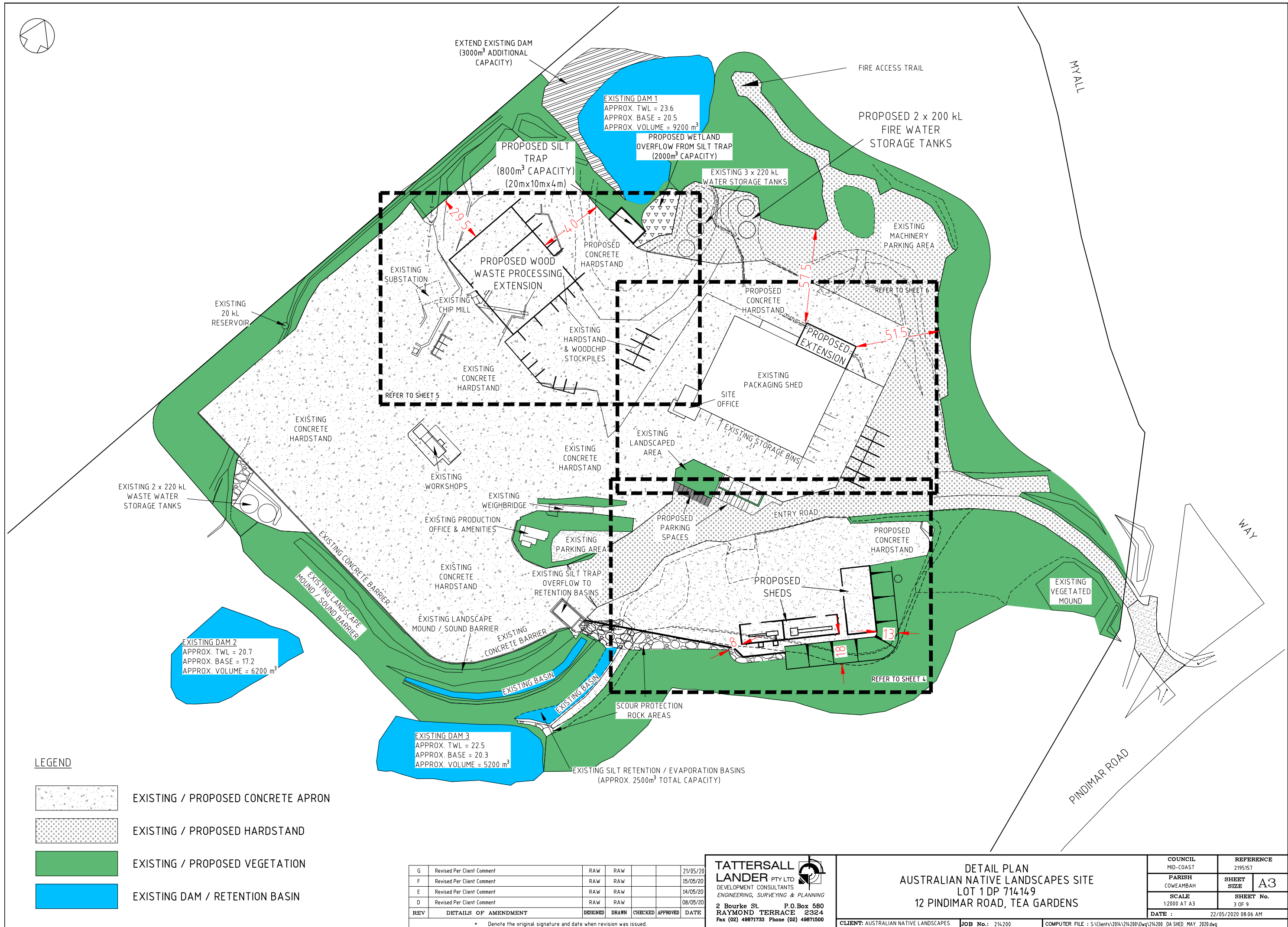
\* Denote the original signature and date when revision was issued.

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SITE PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

COUNCIL MID-COAST	REFERENCE 2195156
PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:4000 AT A3	SHEET No. 2 OF 9
DATE : 22/05/2020 08:06 AM	

CLIENT: AUSTRALIAN NATIVE LANDSCAPES JOB No.: 214200 COMPUTER FILE : S:\Clients\2014\214200\Drawings\214200\_DA SHED\_MAY\_2020.dwg



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E	Revised Per Client Comment	RAW	RAW		14/05/20
D	Revised Per Client Comment	RAW	RAW		08/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	DATE
* Denote the original signature and date when revision was issued.					

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*ENGINEERING, SURVEYING & PLANNING*

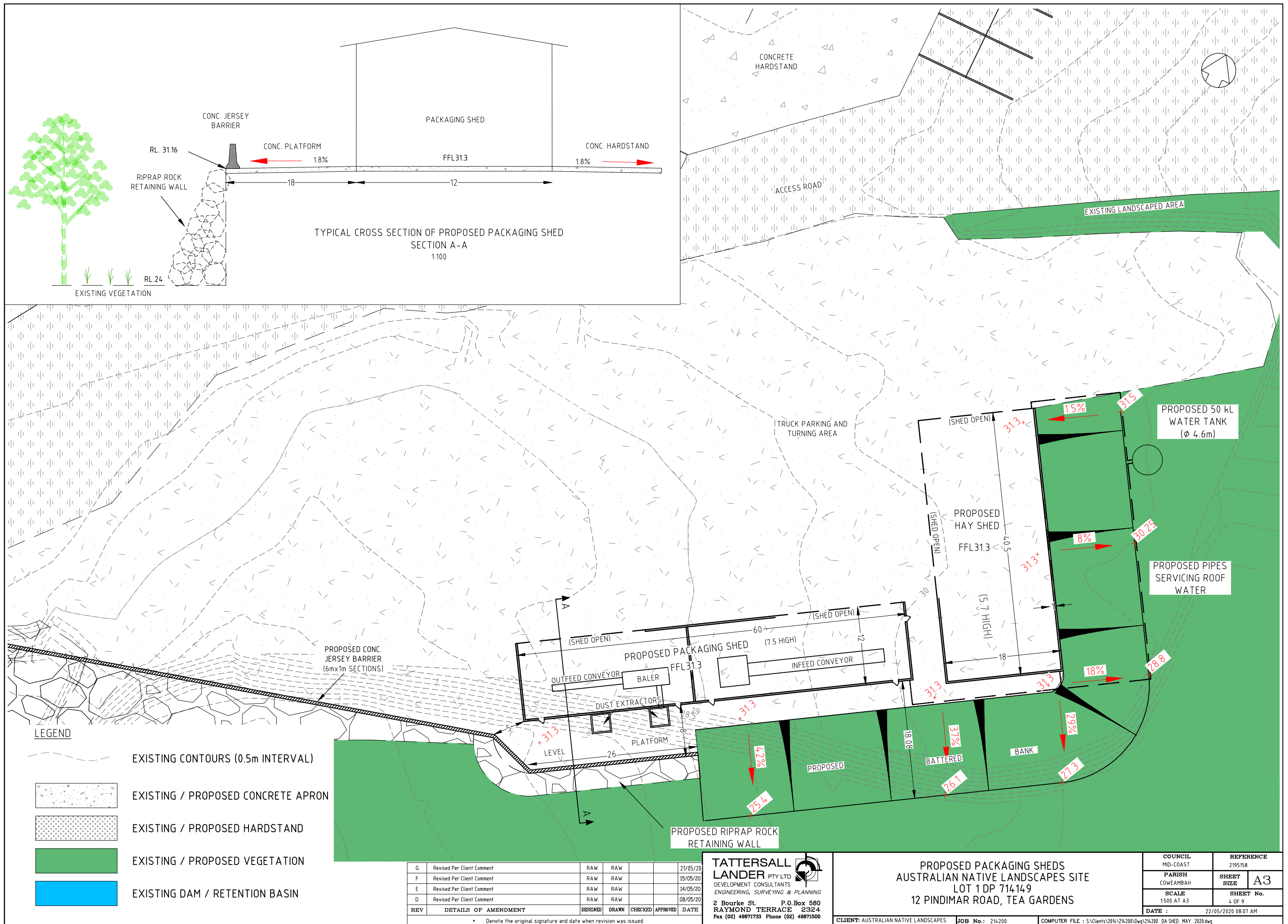
**2 Bourke St. P.O.Box 580  
RAYMOND TERRACE 2324  
Fax (02) 49871733 Phone (02) 49871500**

DETAIL PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

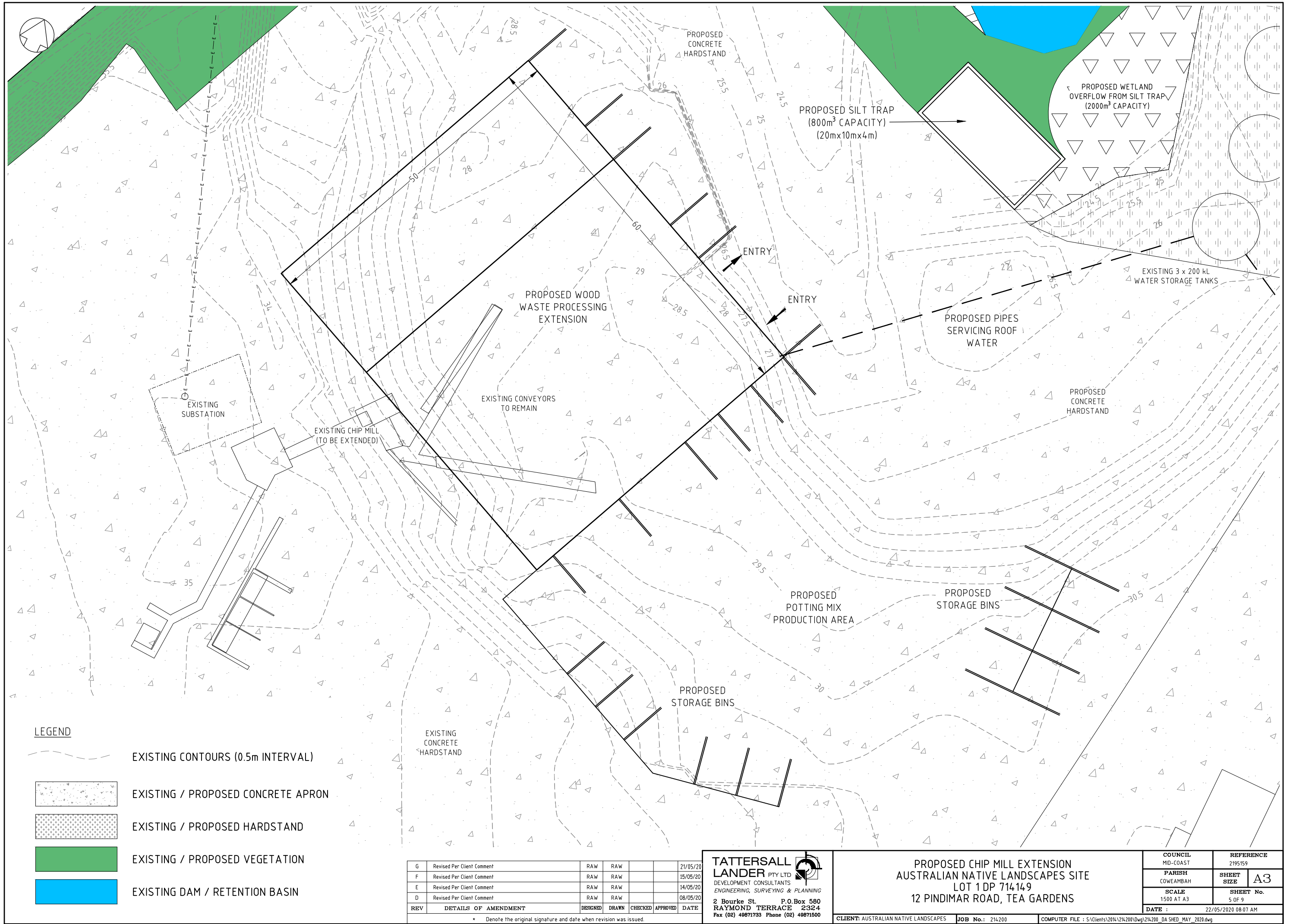
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<b>DATE :</b> 22/05/2020 08:06 AM		

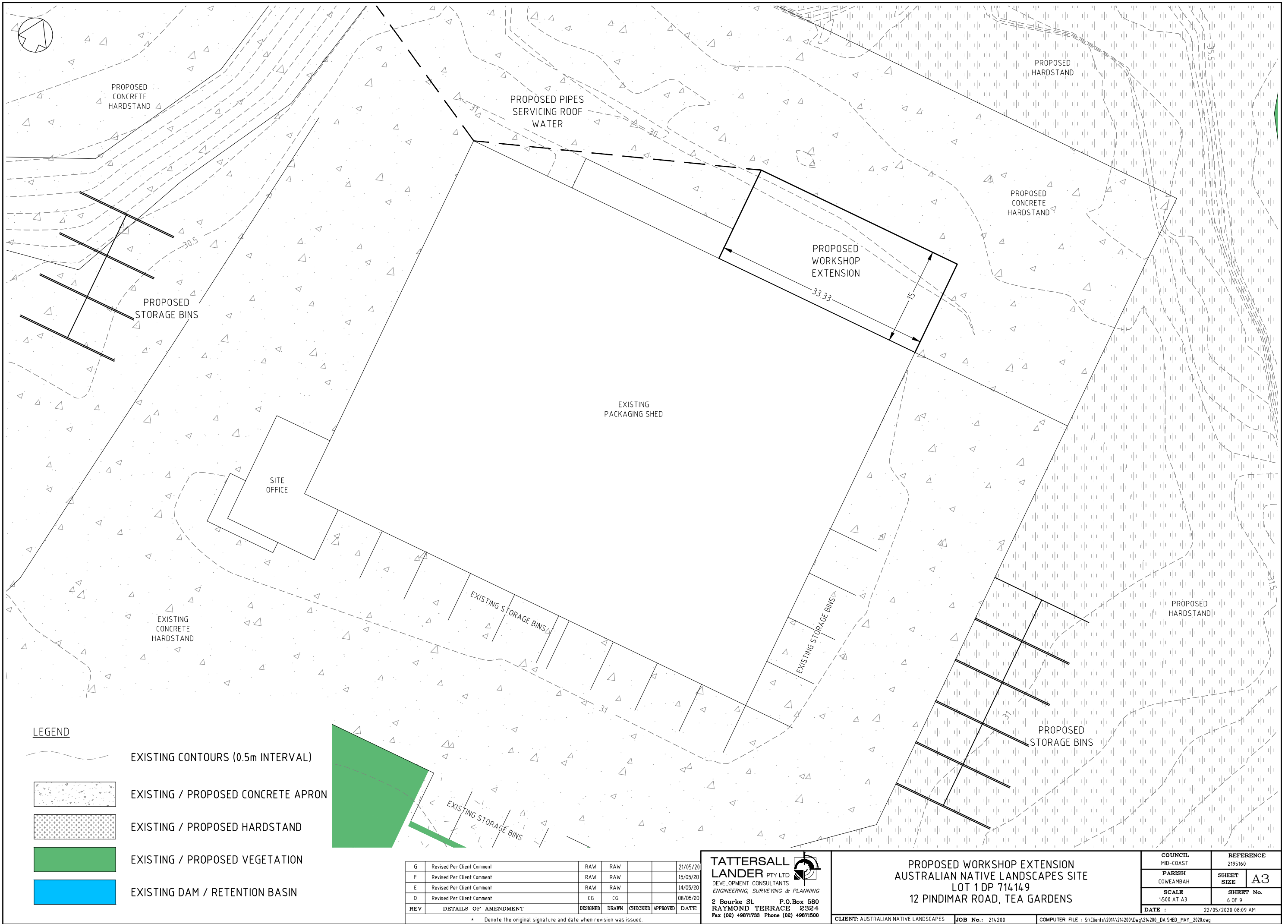
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LEGEND

- EXISTING CONTOURS (0.5m INTERVAL)
- EXISTING / PROPOSED CONCRETE APRON
- EXISTING / PROPOSED HARDSTAND
- EXISTING / PROPOSED VEGETATION
- EXISTING DAM / RETENTION BASIN

G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
E	Revised Per Client Comment	RAW	RAW			14/05/20
D	Revised Per Client Comment	CG	CG			08/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

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PROPOSED WORKSHOP EXTENSION  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

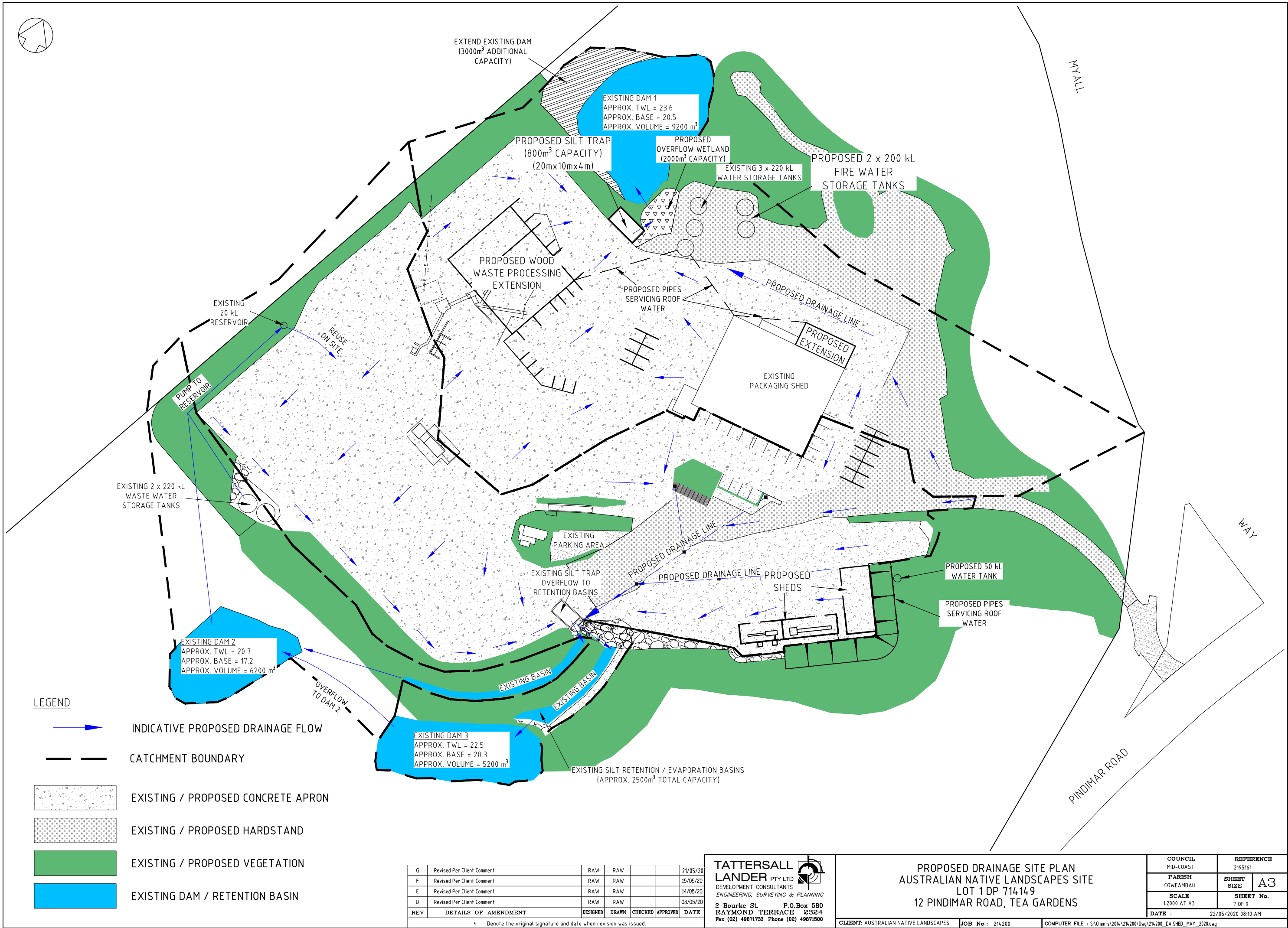
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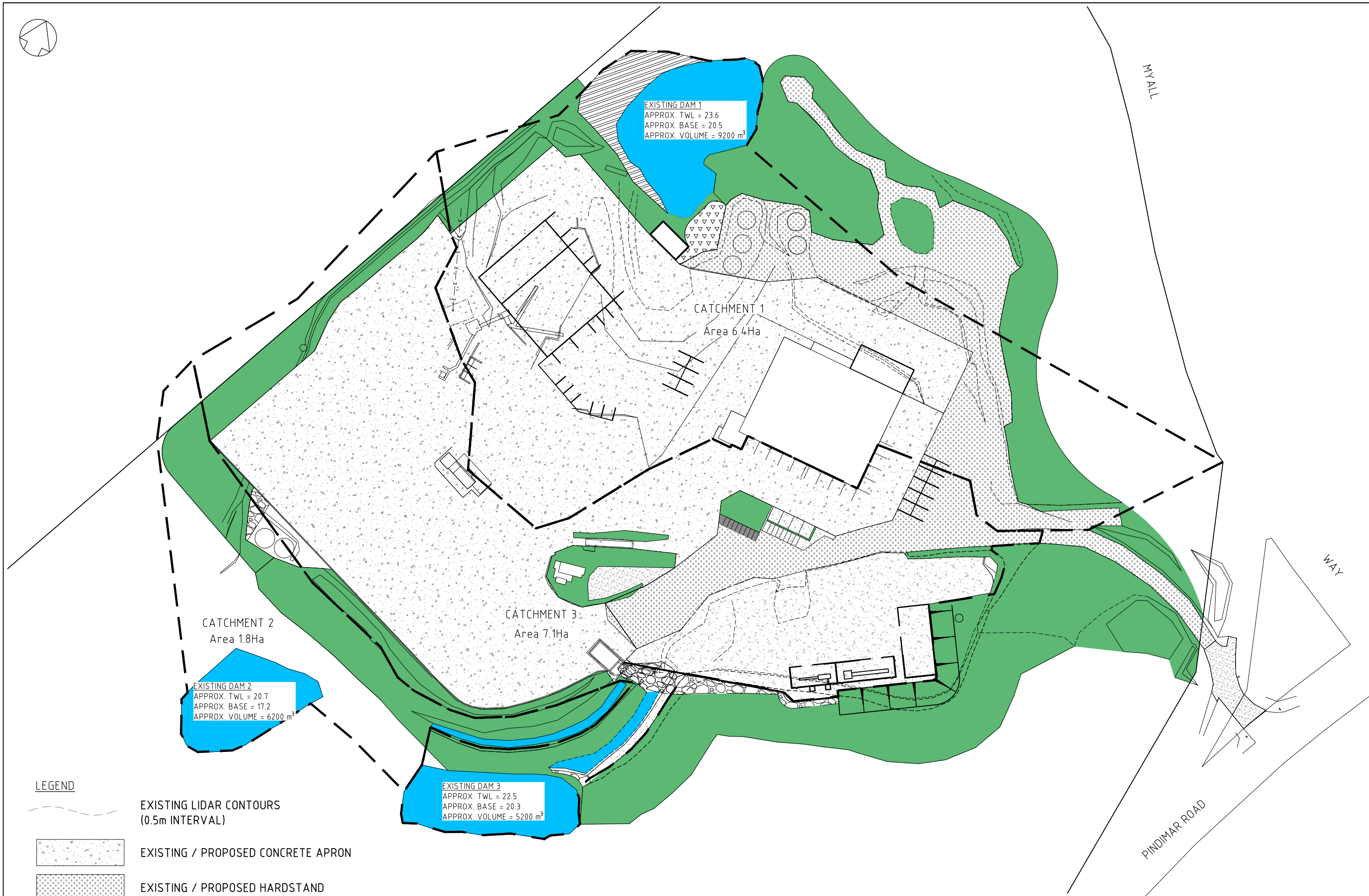
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PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1500 AT A3 6 OF 9	SHEET No.
DATE : 22/05/2020 08:09 AM	







#### LEGEND

- EXISTING LIDAR CONTOURS (0.5m INTERVAL)
- EXISTING / PROPOSED CONCRETE APRON
- EXISTING / PROPOSED HARDSTAND
- EXISTING / PROPOSED VEGETATION
- EXISTING DAM / RETENTION BASIN

G	Revised Per Client Comment	RAW	RAW			21/05/20
F	Revised Per Client Comment	RAW	RAW			15/05/20
E	Revised Per Client Comment	RAW	RAW			14/05/20
D	Revised Per Client Comment	RAW	RAW			08/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

\* Denote the original signature and date when revision was issued.

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CATCHMENT PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

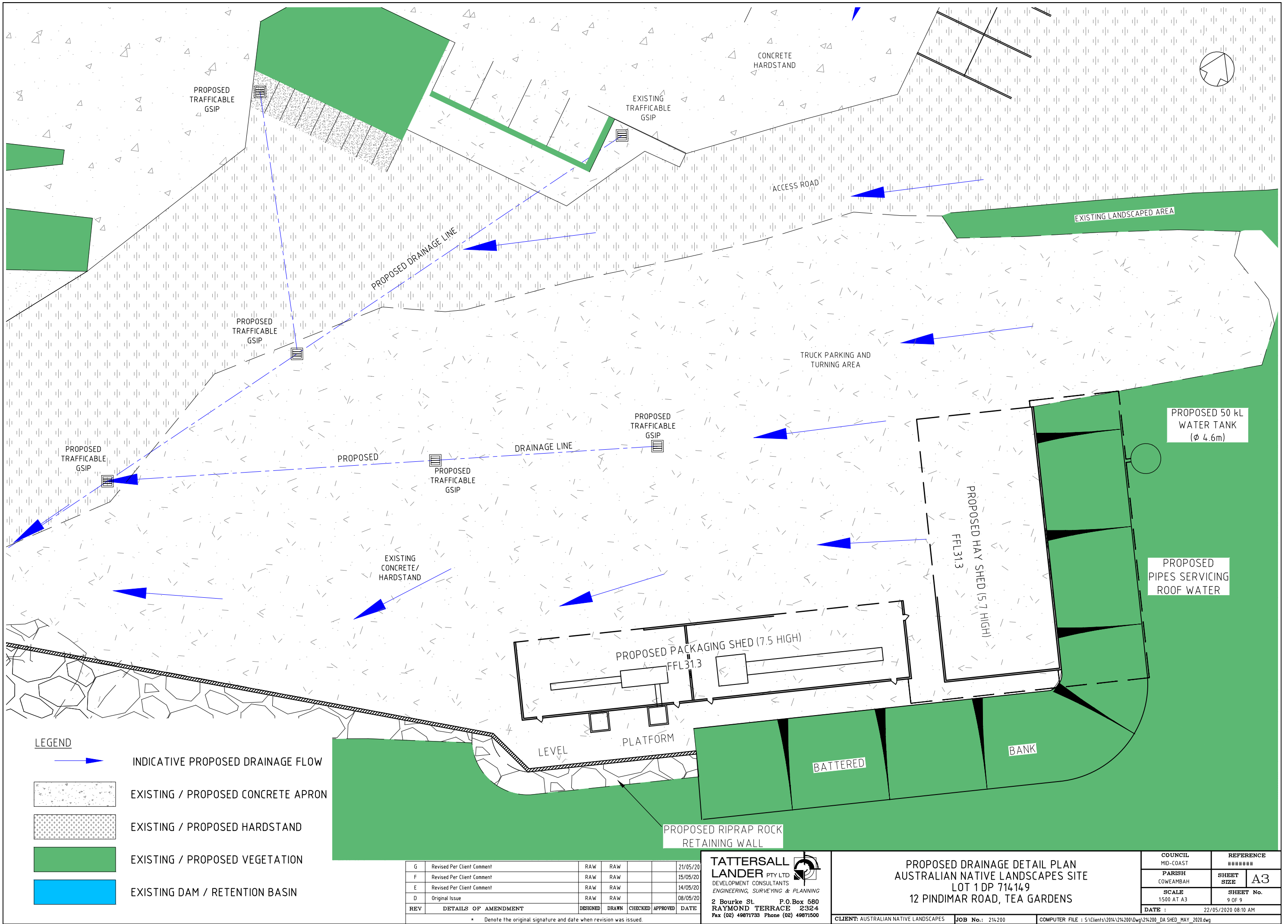
CLIENT: AUSTRALIAN NATIVE LANDSCAPES

JOB No.: 214200

COMPUTER FILE : S:\Clients\2014\214200\Drawings\214200\_DA SHED\_MAY\_2020.dwg

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PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:2000 AT A3	SHEET No. 8 OF 9
DATE : 22/05/2020 08:10 AM	





LEGEND

- INDICATIVE PROPOSED DRAINAGE FLOW
- EXISTING / PROPOSED CONCRETE APRON
- EXISTING / PROPOSED HARDSTAND
- EXISTING / PROPOSED VEGETATION
- EXISTING DAM / RETENTION BASIN

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F	Revised Per Client Comment	RAW	RAW			15/05/20
E	Revised Per Client Comment	RAW	RAW			14/05/20
D	Original Issue	RAW	RAW			08/05/20
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE

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PROPOSED DRAINAGE DETAIL PLAN  
AUSTRALIAN NATIVE LANDSCAPES SITE  
LOT 1 DP 714149  
12 PINDIMAR ROAD, TEA GARDENS

CLIENT: AUSTRALIAN NATIVE LANDSCAPES

JOB No.: 214/200

COMPUTER FILE : S:\Clients\2014\214200\DWG\214200\_DA SHED\_MAY\_2020.dwg

COUNCIL MID-COAST	REFERENCE #####
PARISH COWEAMBAH	SHEET SIZE A3
SCALE 1:500 AT A3	SHEET No. 9 OF 9
DATE : 22/05/2020 08:10 AM	





## **APPENDIX N – FIRE SERVICES AND HYDRAULIC DESIGN**

About Marline Engineering Newcastle

At Marline, we take a comprehensive approach when designing your new development.

With in-house electrical, mechanical and hydraulic engineers, Marline Engineering makes your engineering design needs a breeze. We are able to adjust, implement and create designs on AutoCAD and REVIT which makes it easy for contractors and builders to build our designs.

We advise you on the most affordable, practical and effective solutions and systems based on the site and legal factors.

As consulting engineers, Marline has also expanded the range of services to provide a wide range of building services disciplines including Air-conditioning, Electrical, Hydraulics, Fire Protection and Lift Services.

Marline has seen a huge amount of growth in the Energy sector. We provide services that go above and beyond the standard regulatory requirements and offer unique solutions to your Section J or JV3 Alternative solution reports. We also offer a fast NABERS and BEEC certification that ensures advertising for commercial properties are fully compliant with the CBD advertising rules and regulations.

With engineering consulting experience that dates back as far as 1975, we're one of the best engineering companies in Australia, and have developed the kind of projects that residential and commercial property developers benefit from.

Our Newcastle engineering firm continues to grow, however our team prides itself on every customer receiving the kind of high quality workmanship and personalised service that our company is known for.

To accommodate the expansion and demand for engineering services within Newcastle and throughout New South Wales, Marline Engineering has almost doubled the number of highly trained employees in the last five years.

Our engineering firm currently employs ten engineers, eight technical assistants and an office administrator. As a result, we continue to be leaders amongst engineering companies in Australia, with a large portfolio and a positive attitude.

PROJECT No:  
MN14834

CLIENT:  
WEDGETAIL PROJECT CONSULTING

ARCHITECT:

MECHANICAL - ELECTRICAL - HYDRAULIC - FIRE - ENERGY - NABERS - STORMWATER - SECTION J - BEEC

# Fire Detection Services

## PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING ANL TEA GARDENS, PINDIMAR ROAD, TEA GARDENS, NSW 2324

### DRAWING SCHEDULE

FD-00-000	COVER SHEET
FD-00-001	LEGEND & NOTES
FD-10-001	WOOD WASTE PROCESSING BUILDING - FIRE DETECTION LAYOUT

**100% ISSUE**

**FIRE DETECTION SERVICES**

FD-00-000

4



NOTE: SOME ITEMS MAY NOT BE USED

FIRE DETECTION & OWS

FIP

FAS

FIRE INDICATOR PANEL

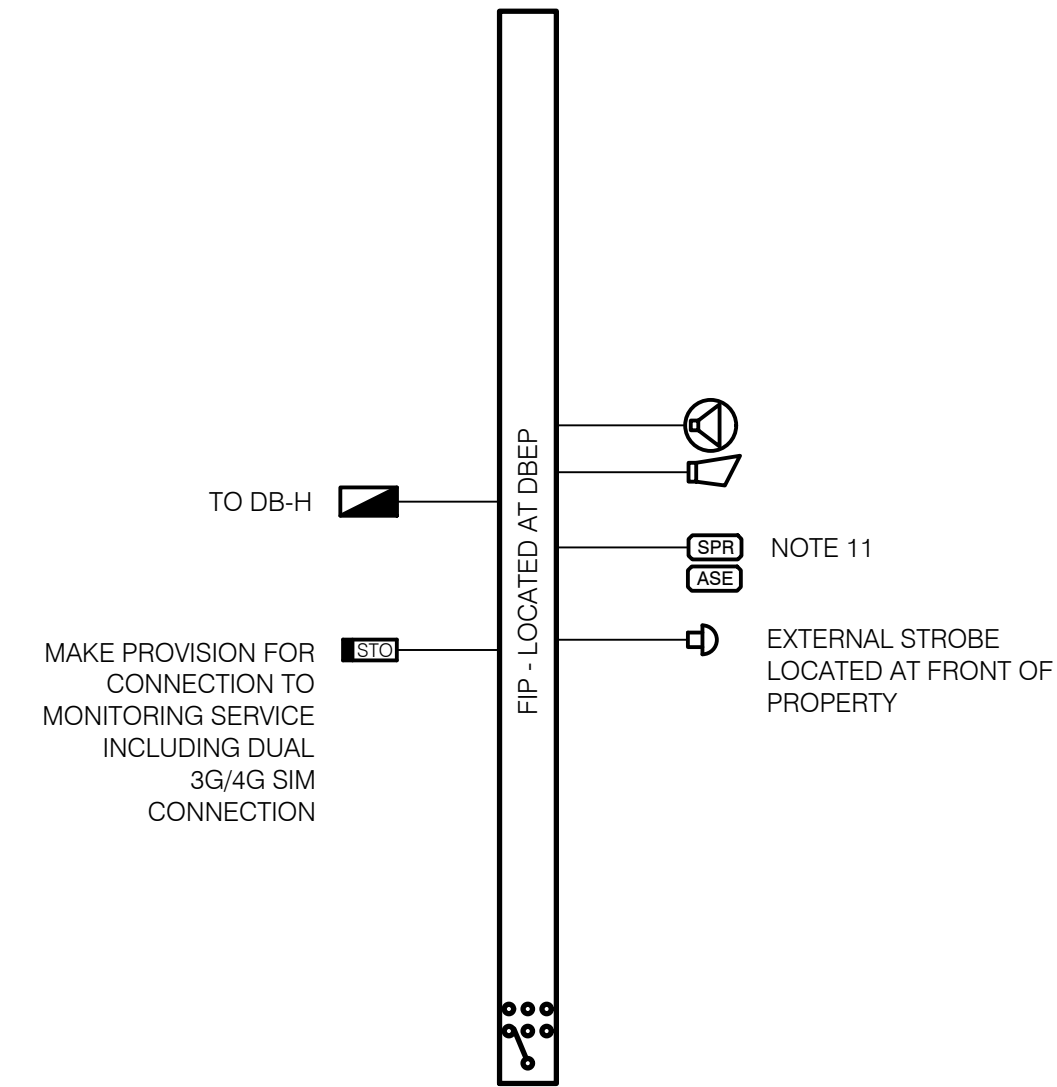
FIRE ALARM SHUTDOWN TRIP - CO-ORDINATE WITH OTHER TRADES

SURFACE MOUNTED SPEAKER

RECESSED SPEAKER

HORN SPEAKER

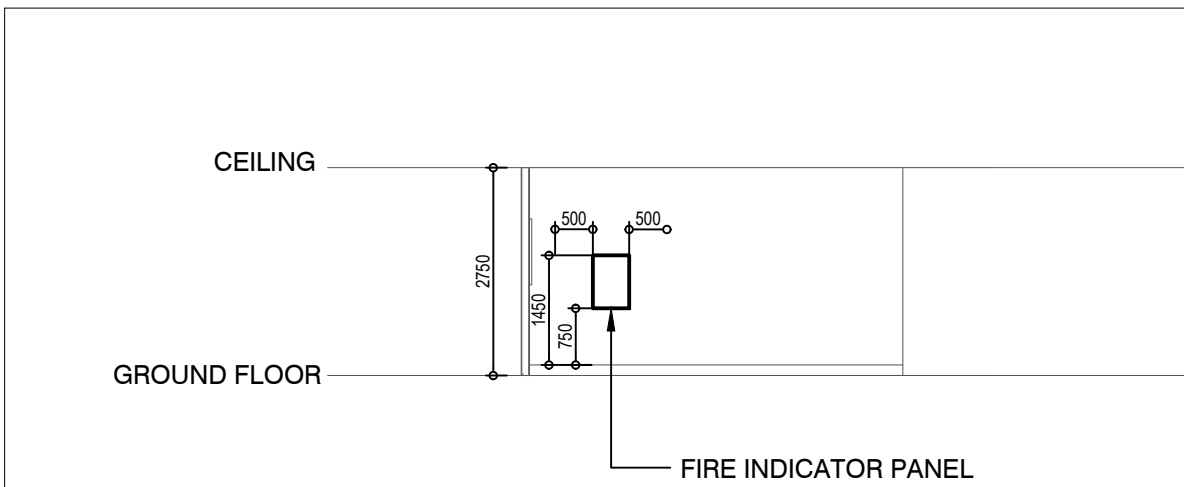
FIRE ALARM BELL & STROBE



## FIRE DETECTION & BUILDING OCCUPANT WARNING SYSTEM BLOCK DIAGRAM

### NOTES:

- PROVIDE A COMPLETE BUILDING OCCUPANT WARNING SYSTEM TO BE PROVIDED IN ACCORDANCE WITH BCA/NCC 2022, SPECIFICATION 20C7, LOCAL COUNCIL, AS 1670.1, & FIRE ENGINEERING REPORT REQUIREMENTS
- FIP TO BE A DIGITAL ADDRESSABLE TYPE.
- THE PROVISION FOR MONITORING IS TO INCLUDE PRIMARY & BACKUP TELEPHONE LINES & ALL ASSOCIATED COSTS. THE ONLY COST PROVIDED BY THE CLIENT IS FOR THE ANNUAL SUPERVISORY SERVICE.
- STROBE TO BE INSTALLED AT DESIGNATED BUILDING ENTRY POINT.
- PROVIDE SIGNAL, CABLING & CONTROL TO UNLOCK ALL EXIT DOORS IN THE EVENT OF A FIRE. LIAISE WITH SECURITY CONTRACTOR & DOOR INSTALLERS ON DETAILS. ACTIVATION OF BREAK GLASS UNITS SHALL ALSO UNLOCK ALL EXIT DOORS.
- PROVIDE FIRE ALARM SHUTDOWN CONTROL CABLING TO THE MSSB CONTROL PANEL AND ALL REQUIRED DUCTED AIR-HANDLING MECHANICAL EQUIPMENT TO INITIATE AUTOMATIC SHUTDOWN WHEN IN ALARM MODE. CO-ORDINATE WITH THE MECHANICAL TRADE AS REQUIRED AND PROVIDE ALL ASSOCIATED CABLING AND CONTROLS.
- THE NUMBER & LOCATION OF BOWS SPEAKERS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL ALLOW SUFFICIENT SPEAKERS (ADDITIONAL SPEAKERS IF REQUIRED) TO PROVIDE THE SOUND LEVEL REQUIRED IN ALL AREAS AS PER AS1670.
- PROVIDE NEW ZONE BLOCK DIAGRAMS ADJACENT THE FIP. ZONE BLOCK DIAGRAMS ARE TO BE PERMANENTLY FIXED, ENGRAVED TRAFFOLYTE TYPE AS PER AS 1670.1.
- PROVIDE COMPLETE DOCUMENTATION OF THE INSTALLATION AS PER AS 1670.1 REQUIREMENTS INCLUDING, BUT NOT LIMITED TO: AS-INSTALLED DOCUMENTATION, EQUIPMENT DETAILS, TEST CERTIFICATES, MAINTENANCE LOGS, AND ZONE BLOCK DIAGRAMS.
- SPRINKLER CONTRACTOR TO PROVIDE INTERFACE TO FIP TO ACTIVATE OCCUPANT WARNING SYSTEM UPON FLOW SWITCH ACTIVATION. SUPPLY AND INSTALL AN ASE TO ALLOW FOR MONITORING OF THE RESIDENTIAL SPRINKLER SYSTEM IN ACCORDANCE WITH BCA/NCC 2022 SPECIFICATION 23C3.



## FIRE INDICATOR PANEL MOUNTING DETAIL

### NOTES:

- FIRE INDICATOR PANEL TO BE INSTALLED SO THE CONTROLS AND INDICATORS ARE NOT LESS THAN 750mm AND NOT MORE THAN 1850mm ABOVE FLOOR LEVEL.
- A MINIMUM CLEARANCE OF 1m IN FRONT AND 0.5m TO EACH SIDE TO BE MAINTAINED IN ACCORDANCE WITH AS1670.1 REQUIREMENTS.

# FIRE DETECTION SERVICES NOTES

### FIRE SERVICES

- ALL WORKS TO THE DRY FIRE DETECTION AND BOWS SYSTEM ARE TO BE COMPLETED THE CURRENT SERVICE AND MAINTENANCE CONTRACTOR.
- PROVIDE A COMPLETE FIRE DETECTION AND ALARM SYSTEM (BOWS) AS DETAILED AND IN ACCORDANCE WITH AS 1670.1, NCC/BCA 2022, THE CONTRACT DRAWINGS, & THE SPECIFICATION. PROVIDE ALL EQUIPMENT NECESSARY TO COMPLETE A WORKING INSTALLATION, INCLUDING FDCIE, DETECTORS, ALL CABLING, POWER SUPPLIES, ACCESS EQUIPMENT, AND ACCESSORIES.
- PROVIDE A BUILDING OCCUPANT WARNING SYSTEM THROUGH SPEAKERS, HORNS, SOUND PROJECTORS, AND VISUAL ALARM DEVICES IN ACCORDANCE WITH AS 1670.4. QUANTITY AND POSITION OF FIRE ALARM SPEAKERS SHOWN IS INDICATIVE ONLY. PROVIDE ADDITIONAL SPEAKERS AS REQUIRED TO MEET THE SOUND PRESSURE LEVELS THROUGHOUT THE BUILDING AS SPECIFIED IN AS 1670.1. ALLOW FOR 5 ADDITIONAL SPEAKERS, PROVIDE TO CLIENT'S REPRESENTATIVE IF ALL 5 ARE NOT UTILISED UPON COMPLETION OF CONTRACT.
- PROVIDE A COMPLETE CONCEALED SPACE DETECTION SYSTEM IN ACCORDANCE WITH AS 1670.1. THE CONCEALED SPACE DETECTION LAYOUT SHOWN IS INDICATIVE ONLY. FINAL POSITIONING OF ALL DETECTORS IS TO BE CO-ORDINATED WITH ALL OTHER IN-CEILING EQUIPMENT AND STRUCTURES. ACCESS IS TO BE PROVIDED TO ALL CONCEALED SPACE DETECTORS FOR MAINTENANCE AND TESTING. ALL CONCEALED SPACE DETECTORS ARE TO BE A PHOTOELECTRIC SMOKE TYPE AS PER AS 1670.1 APPENDIX M UNLESS NOTED OTHERWISE. PROVIDE AN ADDITIONAL 10 DETECTORS TO CATER FOR DETAILED CO-ORDINATION WITH ALL IN-CEILING EQUIPMENT AND STRUCTURE ON SITE.
- FULLY COORDINATE THE FINAL LOCATION OF ALL CEILING MOUNTED DETECTORS AND SPEAKERS WITH LIGHTING AND MECHANICAL AND ARCHITECTURAL LAYOUTS. LIAISE WITH ALL TRADES ON SITE AND PROVIDE ALL INFORMATION TO ENSURE WORKS DO NOT CONFLICT WITH OTHER SERVICES. IMPORTANT: DETECTORS ARE NOT TO BE INSTALLED WITHIN 900mm OF ANY AIR-SUPPLY OPENING (AS 1670.1 CLAUSE 5.1.4).
- EACH DETECTOR ZONE SHALL BE LOADED TO MAXIMUM 75% OF THE CIRCUIT CAPACITY.
- THE FIRE TRADE SHALL BE RESPONSIBLE FOR THE PROVISION OF A FIRE SAFETY MANAGEMENT PLAN DURING THE CONSTRUCTION PERIOD. THIS IS TO BE DEVELOPED IN CONJUNCTION WITH THE CLIENT'S REPRESENTATIVE, SUPERINTENDENT, ARCHITECT, CERTIFIER, AND NSW FIRE SERVICE.
- PROVIDE ZONE BLOCK DIAGRAMS ADJACENT THE FDCIE (FIP) AS PER AS 1670.1. ZONE BLOCK DIAGRAMS ARE TO BE A PERMANENTLY MOUNTED, INDELLIBLE, AND COLOUR CODED TYPE BASED ON THE AS-CONSTRUCTED FLOOR PLANS.

### SEALING AND LABELLING:

- ALL SERVICE PENETRATIONS THROUGH FIRE RATED ELEMENTS MUST BE FIRE SEALED AS PER BCA/NCC 2022 SPECIFICATION 13. PROVIDE REMOVABLE SEALING METHODS (FIRE PILLOWS, ETC) IN LARGE PENETRATIONS TO ALLOW FOR INSTALLATION OF FUTURE SERVICES.
- SEAL ALL PENETRATIONS THROUGH ANY ACOUSTIC WITH AN APPROVED ACOUSTIC SEALANT TO MATCH THE ORIGINAL RATINGS OF THE PENETRATED BARRIER. PROVIDE ACOUSTIC RATED WALL BOXES FOR ALL SERVICES/OUTLETS INSTALLED IN ACOUSTIC WALLS.
- SEAL ALL CONDUITS, DUCTS, AND BUILDING ENTRY POINTS TO PREVENT THE INGRESS OF MOISTURE, DIRT, AND VERMIN. EXTERNAL ENVELOPE PENETRATIONS ARE TO BE SEALED TO MATCH THE ORIGINAL ACOUSTIC/SMOKE/FIRE RATING PERFORMANCE OF THE PENETRATED BARRIER.
- STRUCTURAL MEMBERS AND CAST WALLS OR COLUMNS SHALL NOT BE CUT OR CHASED WITHOUT PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
- ALL SERVICES SHALL BE COMPREHENSIVELY LABELED TO CLEARLY INDICATE THEIR FUNCTION. EACH ITEM OF EQUIPMENT SHALL BE NUMBERED AND TAGGED. ALL LABELLING IS TO BE OF A PERMANENT, INDELLIBLE TYPE OF ENGRAVED TRAFFOLYTE OR SIMILAR.

### CONDUIT:

- CONDUITS AND FITTINGS SHALL COMPLY WITH AS2052, AS/NZS 2053.1-2001, AS/NZS 2053.2-2001, AS/NZS 2053.3-1995, AS/NZS 2053.4-1995, AS/NZS 2053.5-2001, AS/NZS 2053.6-2001, AS/NZS 2053.7-2002, AS/NZS 2053.8-1995 AND ANY OTHER APPLICABLE STANDARD.
- ALL SURFACE MOUNTED CONDUITS SHALL BE INSTALLED IN AN ORDERED MANNER PARALLEL TO WALLS, FLOORS AND CEILINGS AS APPLICABLE BUT ALL CONDUITS CAST IN CONCRETE POURS SHALL BE INSTALLED TO THE MOST SUITABLE DIRECT ROUTE. ALL CONDUITS LAID IN PLASTER OR IN WALL CHASES SHALL BE FIRMLY FIXED IN POSITION TO PREVENT MOVEMENT AND/OR VIBRATION
- IF SURFACE MOUNTED CABLING IS REQUIRED VIA EXTERNAL WALL/ROOF AREAS, CABLING MUST BE CONCEALED IN CONDUIT AND STEEL HAT SECTION FOR THE ENTIRE LENGTH OF CONDUIT. STEEL HAT SECTION IS TO BE SEALED TO PREVENT THE INGRESS OF MOISTURE AND VERMIN AND IS TO BE PAINTED TO MATCH THE SURROUNDING WALL. THE INSTALLATION SHALL BE COMPLETED TO THE SATISFACTION AND APPROVAL OF THE CLIENT'S REPRESENTATIVE.
- PROVIDE PVC COATED DRAW WIRES IN ALL CONDUITS. THE ENDS OF ALL DRAW WIRES SHALL BE SECURELY FIXED IN PLACE TO PREVENT ACCIDENTAL REMOVAL.
- PROVIDE ELECTRICAL CONDUITS OF FLAT WALLED HEAVY-DUTY ORANGE PVC TYPE AND COMMUNICATIONS CONDUITS OF FLAT WALLED LIGHT DUTY WHITE PVC TYPE. PROVIDE CONDUITS OF THE SIZE AND QUANTITY SHOWN ON THE SITE PLAN(S). CORRUGATED CONDUIT OF ANY TYPE IS NOT ACCEPTABLE.
- USE ONLY LARGE RADIUS SWEEP BENDS FOR CHANGES IN DIRECTION AND TRANSITIONS TO VERTICAL RISES. ENSURE THAT CONDUIT BEND RADII ARE LARGER THAN THE MINIMUM BEND RADII OF THE CABLES INSTALLED.
- CONDUIT SADDLES SHALL BE SPACED A MAXIMUM OF 1200MM APART FOR METALLIC CONDUITS OR 1000MM APART FROM NON-METALLIC CONDUITS. IN AREAS SUBJECT TO HIGH AMBIENT TEMPERATURES THE SADDLE SPACING FOR NON-METALLIC CONDUITS SHALL BE REDUCED TO 500MM.

### CABLING:

- ALL CABLE SIZES NOMINATED ON DRAWINGS ARE MINIMUM SIZES EXCLUDING DERATING FOR INSTALLATION FACTORS SUCH AS SPACING, ROUTING, ETC. FINAL SIZES TO BE IN ACCORDANCE WITH AS/NZS 3008 AND AS/NZS 3017. SUBMIT FINAL CABLE SIZES TO SUPERINTENDENT FOR APPROVAL PRIOR TO ORDERING. VARIATIONS RESULTING FROM FAILURE TO COMPLY WITH THIS REQUIREMENT WILL BE REJECTED.
- SUBCIRCUIT MINIMUM CABLE SIZES (INCREASE SIZE WHERE NECESSARY FOR REASONS OF VOLTAGE DROP OR DERATING TO AS/NZS 3008.1 AND AS/NZS 3000):
  - LIGHTING SUBCIRCUITS, INCLUDING EMERGENCY LIGHTING: 2.5mm<sup>2</sup> Cu
  - GENERAL POWER SUBCIRCUITS: 2.5mm<sup>2</sup> Cu
  - CONTROL CIRCUIT INCLUDING ALARMS, EWIS, ETC: 2.5mm<sup>2</sup> Cu
  - FLEXIBLE CORDS: 30/0.25mm<sup>2</sup> Cu
- SUPPORT ALL CABLING IN CEILING SPACE ON CABLE TRAY AND/OR CATENARY WIRE. CATENARY SYSTEMS SHALL BE TIGHTLY INSTALLED WITH ENDS INCORPORATING TURN BUCKLES. CATENARY WIRES SHALL BE OF THE APPROVED TYPE. NO MORE THAN SIX TIPS CABLES SHALL BE SUPPORTED ON A SINGLE CATENARY CABLING SUPPORT SYSTEM.
- WHERE SUBMAIN/SUBCIRCUIT SUPPLIES ARE PROVIDED FOR OTHER TRADES, THE ELECTRICAL CONTRACTOR IS TO LIAISE WITH THE APPROPRIATE TRADE AND CONFIRM RATINGS AND FINAL LOCATIONS OF CABLE TERMINATIONS.
- ALL FINAL SUBCIRCUIT CABLING IS TO BE CONCEALED. ALL CABLING IN CEILING VOIDS IS TO BE FIXED CLEAR OF CEILING AND CEILING SUPPORTS. POWER FINAL SUBCIRCUIT CABLING IS TO BE GENERALLY RUN CONCEALED IN STUD WALLS OR INSTALLED IN CONDUIT CAST INTO BUILDING STRUCTURE AS APPROPRIATE TO OUTLET LOCATIONS. SURFACE MOUNTED CABLING IS ONLY TO BE PROVIDED ON DIRECTION OF THE S.R. AND IS TO BE CONCEALED IN SURFACE MOUNTED CONDUIT PAINTED TO MATCH THE SURROUNDING SURFACE. CONDUIT IS TO BE SECURELY FIXED IN PLACE AND SEALED TO PREVENT THE INGRESS OF DUST, MOISTURE, AND VERMIN.

### EARTHING AND BONDING

- SUPPLY AND INSTALL THE COMPLETE EARTHING SYSTEM FOR THE INSTALLATION INCLUDING ALL ELECTRODES, CABLING, CLAMPS, TEST LINKS AND ALL ASSOCIATED ACCESSORIES AND EQUIPMENT IN ACCORDANCE WITH AS/NZS 3000 AND ANY OTHER RELEVANT STANDARD.
- LIGHTING FITTINGS, SOKED OUTLETS AND FIXED TO APPLIANCES SHALL BE EARTHED BY MEANS OF THE EARTH CONDUCTOR WHICH FORMS PART OF THE RESPECTIVE CIRCUIT CABLING. BARE-EARTH CONNECTIONS ARE NOT ACCEPTABLE.
- THE MECHANICAL AND HYDRAULICS SYSTEMS AS WELL AS ANY FIXTURES SHALL BE BONDED AND EARTHED IN THEIR ENTIRETY BY THE ELECTRICAL TRADE.

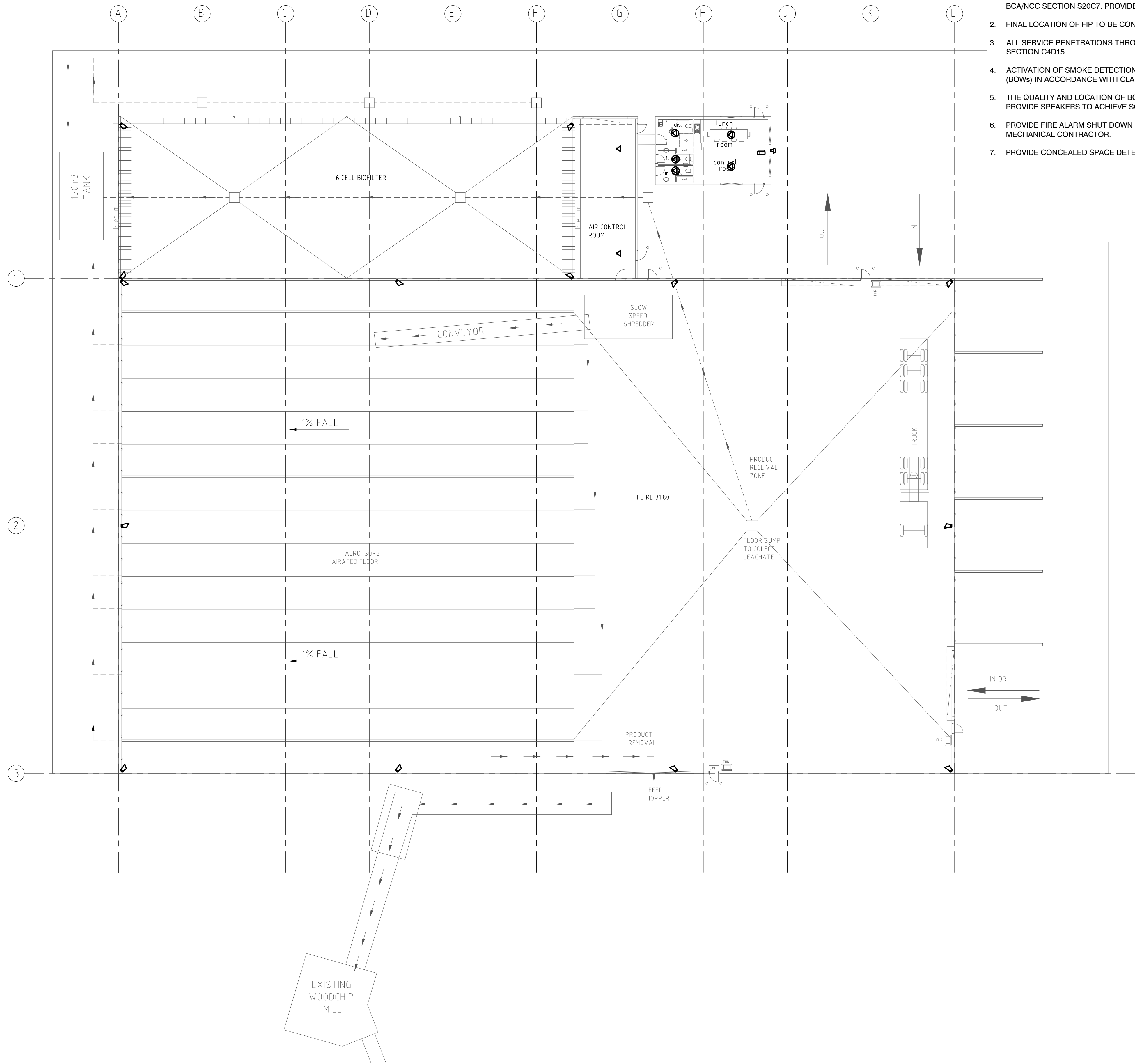
### TESTING AND COMMISSIONING

- UPON COMPLETION OF WORKS, CARRY OUT TESTING FOR THE WORKS COMPLETED AND PROVIDE ELECTRICAL CERTIFICATE OF TEST STATING THAT THE ELECTRICAL INSTALLATION, TO THE EXTENT IT IS AFFECTED BY THE ELECTRICAL WORK, HAS BEEN TESTED TO ENSURE THAT IT IS ELECTRICALLY SAFE AND IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE AS/NZS 3000 AND ANY OTHER REQUIREMENTS APPLYING UNDER THE NSW WORK HEALTH AND SAFETY REGULATION 2017 TO THE ELECTRICAL INSTALLATION. THE ELECTRICAL TRADE SHALL ALLOW FOR THESE WORKS TO BE CARRIED OUT BY AN INDEPENDENT COMMISSIONING SPECIALIST.
- WHERE AN ITEM OF EQUIPMENT OR INSTALLATION FAILS A TEST OR THE DESIRED DESIGN CONDITIONS ARE NOT MET, THE ELECTRICAL TRADE SHALL BE RESPONSIBLE FOR RECTIFICATION THE PROBLEM AND RECOMMISSIONING OF THE EQUIPMENT/INSTALLATION AS REQUIRED.
- PROVIDE TEST REPORTS FOR ALL SYSTEMS. PROVIDE THE CLIENT WITH ALL TEST RESULTS, ROUND FOR REVIEW. THE CERTIFICATE OF PRACTICAL COMPLETION WILL ONLY BE SIGNED AFTER THE COMPLETE TEST REPORTS HAVE BEEN REVIEWED. INCLUDE A HARD AND SOFT COPY OF THE FULL TEST REPORTS IN THE OPERATION AND MAINTENANCE MANUALS.

### HANDOVER & DEFECTS LIABILITY PERIOD

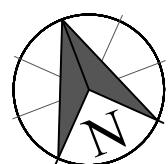
- GUARANTEE ALL WORK AND MATERIALS AS TO QUALITY, WORKMANSHIP, AND AGAINST DEFECTS FOR A PERIOD OF 12 MONTHS FROM THE DATE OF ISSUE OF THE CERTIFICATE OF PRACTICAL COMPLETION. DURING THIS PERIOD, PROMPTLY REPLACE ALL DEFECTIVE EQUIPMENT, FITTINGS, AND MATERIALS AT NO ADDITIONAL COST. THIS INCLUDES ALL LABOUR AND COSTS NECESSARY FOR THE REMOVAL OF DEFECTIVE PARTS OF COMPONENTS AND OF INSTALLING AND TESTING REPLACEMENTS. PROMPTLY RESPOND TO ALL DEFECTS AND MAINTENANCE ISSUES WITH RAISED BY THE CLIENT OR SUPERINTENDENT DURING THE DEFECTS LIABILITY PERIOD.
- THE CONTRACTOR WILL BE REQUIRED TO FULLY DEMONSTRATE AND TRAIN THE CLIENT'S STAFF ON THE OPERATION OF EACH INSTALLATION. THIS SHALL BE CARRIED OUT ONCE PRIOR TO HANDOVER AND ONCE ONE (1) MONTHS POST-HANDOVER IF REQUIRED. SPECIALIST SUB-CONTRACTORS/INSTALLERS SHALL BE IN ATTENDANCE.
- THE ENTIRE INSTALLATION SHALL BE HANDED OVER TO THE CLIENT NEW, CLEAN AND FREE FROM ANY DAMAGE OR DEFECT.
- PRIOR TO HAND OVER, THE ELECTRICAL TRADE SHALL SUBMIT TO THE CLIENT'S REPRESENTATIVE A COPY OF THE HEALTH AND SAFETY FILE, INSTALLATION OPERATION AND MAINTENANCE MANUALS, TESTING AND COMMISSIONING REPORTS, AND AS BUILT DRAWINGS FOR REVIEW AND APPROVAL. ONCE APPROVED, THE ELECTRICAL TRADE SHALL PROVIDE TO THE CLIENT, THREE HARD AND SOFT COPIES OF THESE DOCUMENTS. NEITHER PRACTICAL NOR FINAL COMPLETION WILL BE CERTIFIED UNTIL THESE DOCUMENTS HAVE BEEN APPROVED AND RECEIVED BY THE CLIENT'S REPRESENTATIVE.
- UPON COMPLETION OF THE WORKS, AND PRIOR TO THE ISSUE OF THE NOTICE OF PRACTICAL COMPLETION, SUPPLY REVIEWED AND AMENDED (AS MAY HAVE BEEN REQUIRED) REPRODUCIBLE AS-CONSTRUCTED DRAWINGS, IN AutoCAD SHOWING THE COMPLETE SERVICES INSTALLATION "AS CONSTRUCTED". PROVIDE ONE (1) A3 SET OF THESE DRAWINGS, BOUND INTO THE OPERATING AND MAINTENANCE MANUAL TOGETHER WITH AN ELECTRONIC COPY OF AutoCAD AND PDF FILES ON USB STORAGE MEDIA.
- SUPPLY THREE (3) HARD COPIES AND TWO (2) ELECTRONIC COPIES OF THE OPERATING AND MAINTENANCE MANUALS PRIOR TO THE DATE OF PRACTICAL COMPLETION. THE ELECTRONIC COPY SHALL BE IN PDF FORMAT, SINGLE FILE WITH SHOP DRAWINGS AND TESTING AND COMMISSIONING DATA INCLUDED. THESE MANUALS INCLUDE AS A MINIMUM:
  - GENERAL DESCRIPTION OF SYSTEMS.
  - MANUFACTURERS DIRECTIONS.
  - NORMAL OPERATING PROCEDURES.
  - EMERGENCY OPERATING PROCEDURES.
  - ELECTRICAL AND CONTROL SYSTEMS DESCRIPTIONS.
  - METHOD OF ADJUSTING SYSTEMS.
  - LIST OF EQUIPMENT INSTALLED WITH MANUFACTURERS' NAMES, ADDRESSES AND TELEPHONE NUMBERS.
  - MAINTENANCE INSTRUCTIONS FOR EQUIPMENT AND SYSTEMS.
  - A COPY OF ALL TEST RESULTS.
  - SYSTEM COMPLIANCE CERTIFICATION.
  - AS CONSTRUCTED DRAWINGSALSO INCLUDE: GUARANTEES, CERTIFICATES OF APPROVALS, PERFORMANCE AND TEST DATA SHEETS, COMMISSIONING RECORDS, MANUFACTURERS TEST RESULTS, MANUFACTURERS DIRECTIONS, ETC. RETAIN ANY MANUFACTURERS DIRECTIONS ON SITE FOR REFERENCE AND LATER INCLUSION IN THE OPERATING AND MAINTENANCE MANUALS. REFER TO ELECTRICAL SPECIFICATION FOR FULL REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS ALONG WITH MINIMUM TRAINING REQUIREMENTS.
- THE CONTRACTOR SHALL UNDERTAKE THERMAL IMAGING OF ALL SWITCHBOARDS PRIOR TO PRACTICAL COMPLETION AND AGAIN PRIOR TO THE END OF THE DEFECTS LIABILITY PERIOD. PROVIDE A REPORT PRESENTING THE RESULTS AND WHERE CABLE/JOINT/EQUIPMENT TEMPERATURES LIE OUTSIDE GENERALLY ACCEPTABLE OR SAFE VALUES, THE ELECTRICAL SHALL BE RESPONSIBLE FOR PROVISION OF REMEDIAL MEASURES.

## MECHANICAL — ELECTRICAL — HYDRAULIC — FIRE — ENERGY — NABERS — STORMWATER — SECTION J — BEEC



FIRE DETECTION NOTES:

1. PROVIDE A COMPLETE BUILDING OCCUPANT WARNING SYSTEM IN ACCORDANCE WITH AS 1670.1, AND BCA/NCC SECTION S20C7. PROVIDE ALL NECESSARY EQUIPMENT AND CABLING FOR A COMPLIANT SYSTEM.
2. FINAL LOCATION OF FIP TO BE CONFIRMED ON SITE - ENSURE CLEARANCES AS PER AS 1670.1
3. ALL SERVICE PENETRATIONS THROUGH FIRE RATED ELEMENTS MUST BE FIRE SEALED AS PER BCA/NCC SECTION C4D15.
4. ACTIVATION OF SMOKE DETECTION SYSTEM WILL OPERATE AN BUILDING OCCUPANT WARNING SYSTEM (BOWs) IN ACCORDANCE WITH CLAUSE 3.22 OF AS 1670.1.
5. THE QUALITY AND LOCATION OF BOWs SPEAKERS ARE INDICATIVE ONLY - FIRE ALARM CONTRACTOR TO PROVIDE SPEAKERS TO ACHIEVE SOUND LEVELS AS PER FIRE ENGINEERS REPORT.
6. PROVIDE FIRE ALARM SHUT DOWN TRIP TO ALL MECHANICAL AIR HANDLING PLANT - CO-ORDINATE WITH MECHANICAL CONTRACTOR.
7. PROVIDE CONCEALED SPACE DETECTORS IN ACCORDANCE WITH AS1670.1 REQUIREMENTS.



Rev	Date	Reason for Issue
4	21.08.24	100% ISSUE
3	02.07.24	100% ISSUE FOR REVIEW
2	19.06.24	REVISED AS REQUESTED
1	03.06.24	50% ISSUE FOR REVIEW

Drawn	Design	Verify
D.M.	J.H.	J.H.
D.M.	J.H.	J.H.
D.M.	J.H.	J.H.
D.M.	J.H.	J.H.

Project  
**PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING**  
ANL TEA GARDENS  
PINDIMAR ROAD, TEA GARDENS, NSW 2324

Drawing Title  
**WOOD WASTE PROCESSING BUILDING**  
**FIRE DETECTION LAYOUT**

Discipline  
**FIRE DETECTION SERVICES**  
Job No. Drawing No. Rev  
MN14834 FD-10-001 4



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PROJECT No:  
MN14834

CLIENT:  
WEDGETAIL PROJECT CONSULTING

ARCHITECT:

Fire Services

PROPOSED EXTENSION  
WOOD WASTE PROCESSING BUILDING  
ANL TEA GARDENS, PINDIMAR ROAD, TEA GARDENS, NSW 2324

DRAWING SCHEDULE	
FH-00-000	COVER SHEET
FH-00-001	LEGEND & NOTES
FH-00-002	SITE SERVICES
FH-10-001	WOOD WASTE PROCESSING BUILDING - FIRE SERVICES LAYOUT
FH-20-001	DETAILS - SHEET 1
FH-20-002	DETAILS - SHEET 2



LINETYPES

	COLD WATER
	FIRE HYDRANT
	COLD WATER
	FIRE HYDRANT
	30m INTERNAL FIRE HYDRANT RUN
	60m EXTERNAL FIRE HYDRANT RUN
	10m FIRE HYDRANT SPRAY
	36m FIRE HOSE REEL RUN
	4m FIRE HOSE REEL SPRAY
	FIRE WALL
	SMOKE WALL

ABBREVIATIONS

DPH	DOUBLE PILLAR HYDRANT.
e	EXISTING.
FH	FIRE HYDRANT.
FHR	FIRE HOSE REEL.

KEY

	AREA NOT COVERED BY HYDRANT OR HOSE REEL.
	10m EXCLUSION ZONE FROM BUILDING
	HYDRANT BOOSTER IN LINE OF SIGHT OF FRONT ENTRY

SYMBOLS - FIRE

	BOOSTER ASSEMBLY
	PUMP SET
	VALVE SET
	TEST POINT
	ALARM STROBE
	SINGLE PILLAR HYDRANT (INTERNAL)
	DOUBLE PILLAR HYDRANT (EXTERNAL)
	STREET HYDRANT
	FIRE HOSE REEL
	THRUST BLOCK
	FIRE INDICATOR PANEL
	FIRE TRUCK (MUST BE LOCATED MINIMUM 10m FROM BUILDING & MAXIMUM 20m FROM FEED HYDRANT).

WATER REQUIREMENTS

FIRE HYDRANTS

ALL CLASS BUILDING SPRINKLED  $>1000m^2 \leq 10,000m^2$  = 20L/S

SPRINKLER

OH3 FIRE SPRINKLER DESIGN - ROOF SLOPE  $<6^\circ$  18 OPERATIONAL HEADS @ 1L/SEC EACH = 18L/S

TOTAL WATER REQUIREMENTS = 38L/S

STORED WATER REQUIREMENTS

WATER REQUIRED TO BE STORED

20L/SEC - HYDRANT  
18L/SEC - SPRINKLER

FIRE HYDRANTS

20L/SEC x 4 HOURS STORAGE REQUIREMENT = 288,000L

FIRE SPRINKLER

18L/SEC x 1 HOUR STORAGE REQUIREMENT + 20% = 78,000L

TOTAL STORED WATER

366,000L EFFECTIVE CAPACITY  
2x 200,000L TANKS (50% CAPACITY EACH)

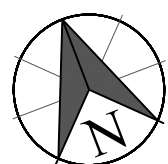
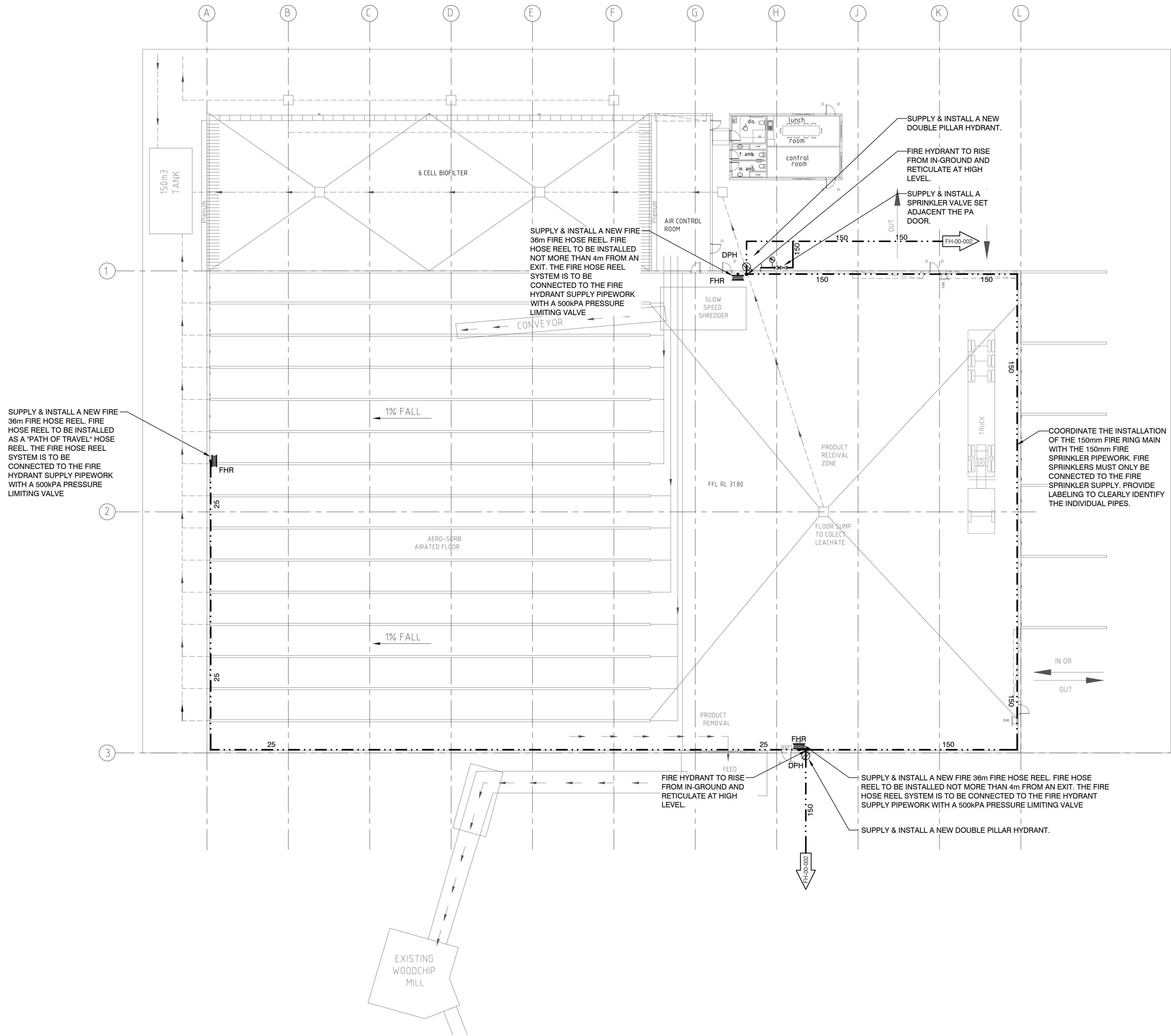
GENERAL NOTES

- ISOLATION VALVE AT WATER METER ASSEMBLY TO BE SECURED IN THE OPEN POSITION BY A PADLOCKED METAL STRAP AND AN ENGRAVED NON FERROUS METAL LABEL ATTACHED. LABEL TO BE ENGRAVED WITH 8mm UPPER CASE WORDING: 'FIRE SERVICE VALVE - CLOSE ONLY TO SERVICE FIRE HOSE REELS'.
- ALL SERVICES INSTALLED ADJACENT THE BUILDING ARE TO BE LOCATED OUTSIDE THE ZONE OF INFLUENCE AS PER AS3500.
- ALL HYDRANT PIPEWORK TO BE BLUE BRUTE CLASS 16 INGROUND OR GALVANIZED STEEL ABOVE GROUND TO COMPLY WITH AUSTRALIAN STANDARDS. ALL BLUE BRUTE PIPEWORK TO BE SUPPORTED BY THRUST BLOCKS.









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4	21.08.24	100% ISSUE
3	02.07.24	100% ISSUE FOR REVIEW
2	19.06.24	REVISED AS REQUESTED
1	31.01.24	50% ISSUE FOR REVIEW

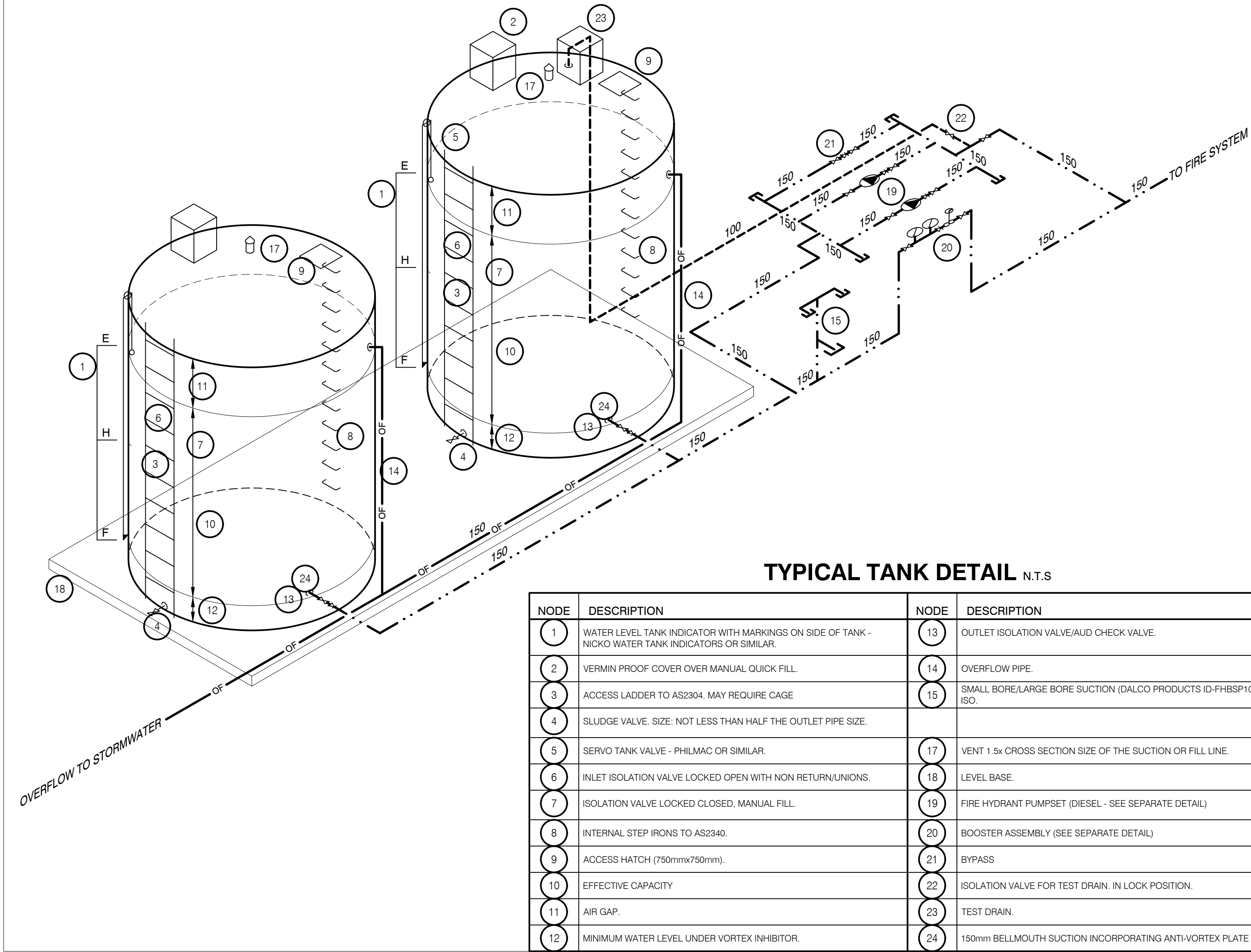
Drawn	Design	Verify
CM	CB	DW
CM	CB	
CM	CB	
CM	CB	

Project  
**PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING**  
ANL TEA GARDENS  
PINDIMAR ROAD, TEA GARDENS, NSW 2324

Drawing Title  
**WOOD WASTE PROCESSING BUILDING**  
**FIRE SERVICES LAYOUT**

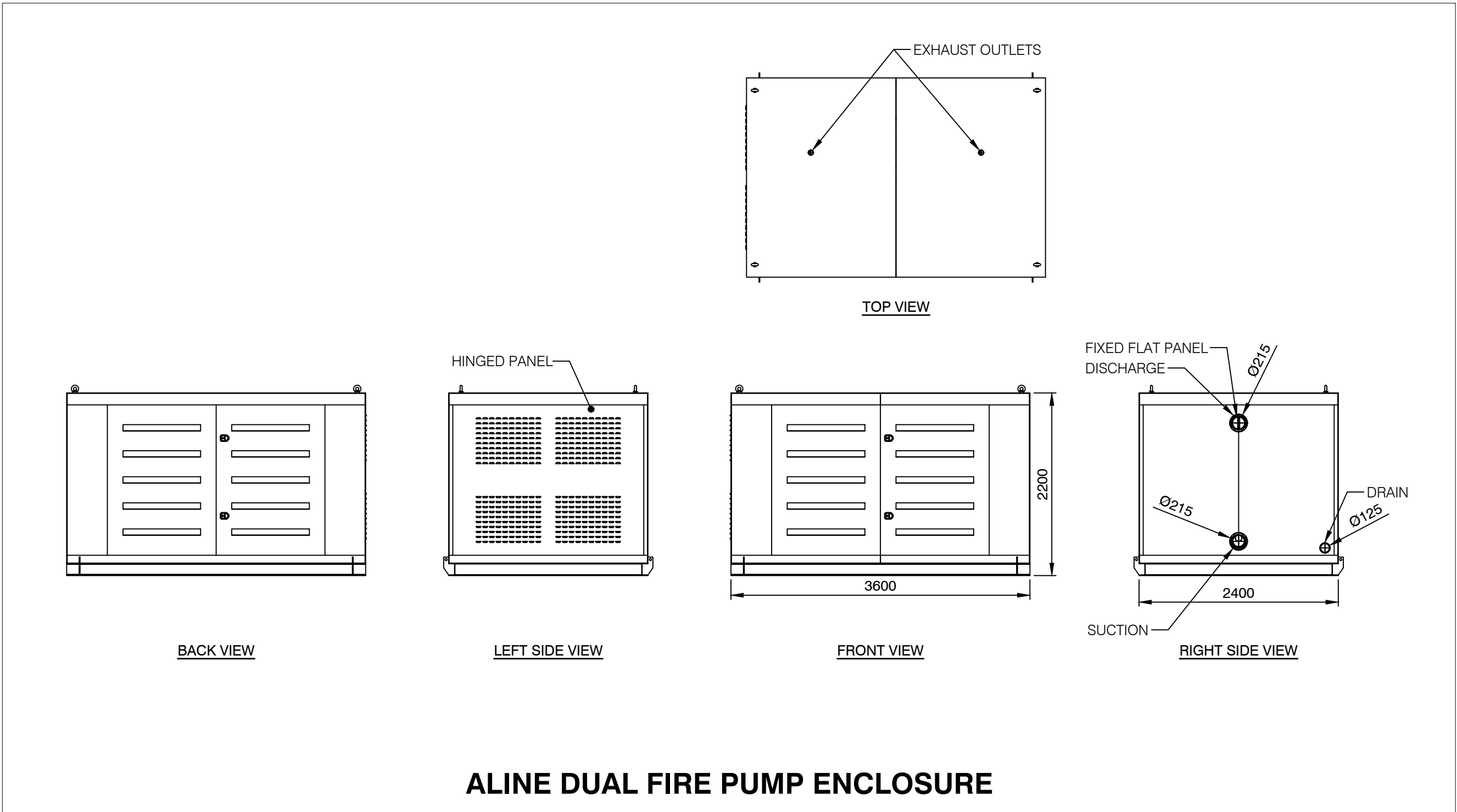
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	MN14834	FH-10-001	4





TYPICAL TANK DETAIL N.T.S

NODE	DESCRIPTION	NODE	DESCRIPTION
1	WATER LEVEL TANK INDICATOR WITH MARKINGS ON SIDE OF TANK - NICKO WATER TANK INDICATORS OR SIMILAR.	13	OUTLET ISOLATION VALVE/AUD CHECK VALVE.
2	VERMIN PROOF COVER OVER MANUAL QUICK FILL.	14	OVERFLOW PIPE.
3	ACCESS LADDER TO AS2304. MAY REQUIRE CAGE	15	SMALL BORE/LARGE BORE SUCTION (DALCO PRODUCTS ID-FH8SP100 & ISO.
4	SLUDGE VALVE. SIZE: NOT LESS THAN HALF THE OUTLET PIPE SIZE.		
5	SERVO TANK VALVE - PHILMAC OR SIMILAR.	17	VENT 1.5x CROSS SECTION SIZE OF THE SUCTION OR FILL LINE.
6	INLET ISOLATION VALVE LOCKED OPEN WITH NON RETURN/UNIONS.	18	LEVEL BASE.
7	ISOLATION VALVE LOCKED CLOSED, MANUAL FILL.	19	FIRE HYDRANT PUMPSET (DIESEL - SEE SEPARATE DETAIL)
8	INTERNAL STEP IRONS TO AS2340.	20	BOOSTER ASSEMBLY (SEE SEPARATE DETAIL)
9	ACCESS HATCH (750mmx750mm).	21	BYPASS
10	EFFECTIVE CAPACITY	22	ISOLATION VALVE FOR TEST DRAIN. IN LOCK POSITION.
11	AIR GAP.	23	TEST DRAIN.
12	MINIMUM WATER LEVEL UNDER VORTEX INHIBITOR.	24	150mm BELLMOUTH SUCTION INCORPORATING ANTI-VORTEX PLATE





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ARCHITECT:

MECHANICAL - ELECTRICAL - HYDRAULIC - FIRE - ENERGY - NABERS - STORMWATER - SECTION J - BEEC

# Fire Sprinkler Services

## PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING ANL TEA GARDENS, PINDIMAR ROAD, TEA GARDENS, NSW 2324

### DRAWING SCHEDULE

FS-00-000	COVER SHEET
FS-00-001	LEGEND & NOTES
FS-10-001	WOOD WASTE PROCESSING BUILDING - FIRE SPRINKLER LAYOUT

100% ISSUE

FIRE SPRINKLER SERVICES

FS-00-000

4

LINETYPES - EXISTING

	SPRINKLER
	WINDOW DRENCHER
	DISUSE PIPE

LINETYPES - NEW

	SPRINKLER
	WINDOW DRENCHER

SYMBOLS

	DELETED EXPOSED SPRINKLER
	EXISTING EXPOSED SPRINKLER
	NEW EXPOSED SPRINKLER
	DELETED CONCEALED SPRINKLER
	EXISTING CONCEALED SPRINKLER
	NEW CONCEALED SPRINKLER
	DELETED FULLY RECESSED CEILING SPRINKLER
	EXISTING FULLY RECESSED CEILING SPRINKLER
	NEW FULLY RECESSED CEILING SPRINKLER
	DELETED SIDE WALL SPRINKLER
	EXISTING SIDE WALL SPRINKLER
	NEW SIDE WALL SPRINKLER
	DELETED WINDOW/WALL WETTING DRENCHER
	EXISTING WINDOW/WALL WETTING DRENCHER
	NEW WINDOW/WALL WETTING DRENCHER
	ALARM STROBE
	FIRE INDICATOR PANEL
	SPRINKLER PUMP SET
	SPRINKLER VALVE SET
	SPRINKLER TEST POINT

SYMBOLS - FIRE

	BOOSTER ASSEMBLY
	PUMP SET
	VALVE SET
	TEST POINT
	ALARM STROBE
	SINGLE PILLAR HYDRANT (INTERNAL)
	DOUBLE PILLAR HYDRANT (EXTERNAL)
	STREET HYDRANT
	FIRE HOSE REEL
	THRUST BLOCK
	FIRE INDICATOR PANEL

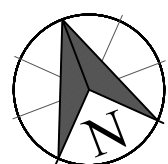
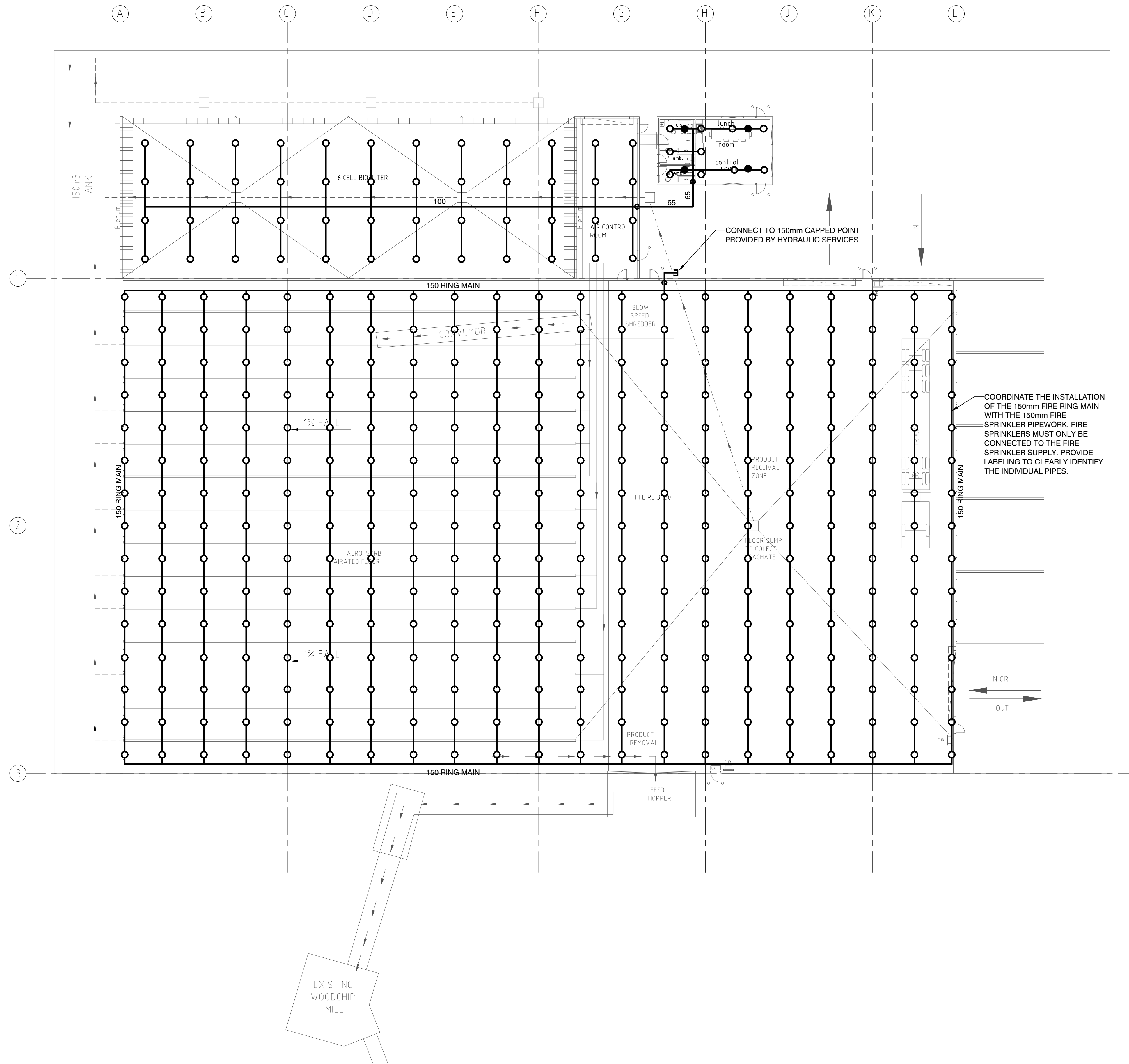
ABBREVIATIONS

e	EXISTING.
SVS	SPRINKLER VALVE SET.
WD	WINDOW DRENCHER.
WDE	WINDOW DRENCHER EXTERNAL.
WDI	WINDOW DRENCHER INTERNAL.

GENERAL NOTES

- ALL RANGE PIPES TO ONE HEAD SHALL BE 25mm UNLESS NOTED OTHERWISE.
- ALLOW TO DRAIN DOWN. TEST, REFILL & COMMISSION THE SYSTEM & RECHARGE AS NECESSARY TO UNDERTAKE THE WORKS REQUIRED.
- ALLOW TO SUPPLY & INSTALL AS ADDITIONAL 20 SPRINKLER HEADS FOR COORDINATION.
- SPRINKLER HEAD IN CEILING SHALL BE LOW PROFILE MINIMATICS TYPE WITH TWO PIECE ESCUTCHEON PLATE. THE HEADS & ESCUTCHEON PLATES SHALL BE POWDER COATED TO A COLOUR NOMINATED BY THE ARCHITECT.
- NUMBER & LOCATIONS OF HEADS OF PIPEWORK IS INDICATIVE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE WITH AS2118.4 - RESIDENTIAL CODE. THE CONTRACTOR IS TO SUBMIT WORKSHOP DRAWINGS OF THE PROPOSED DESIGN & CALCULATIONS FOR APPROVAL PRIOR TO COMMENCEMENT OF WORKS. ALL SPRINKLERS TO BE LOCATED CLEAR OF ALL LIGHT FITTINGS, EXIT SIGNS ETC WHICH WILL IMPEDE OPERATION OF THE HEADS.
- IT IS THE CONTRACTORS RESPONSIBILITY TO FULLY COORDINATE THE LOCATION OF ALL SPRINKLER HEADS & PIPEWORK WITH OTHER SERVICES (ie. STRUCTURAL, LIGHT FITTINGS, SMOKE DETECTORS ETC) PRIOR TO THE INSTALLATION OF ANY WORKS.
- OPERATION & MAINTENANCE MANUALS. MANUALS & DRAWINGS SHALL BE PRODUCED & SUBMITTED IN ACCORDANCE WITH THE SUPERINTENDENT'S REQUIREMENTS.
- INSTALLATION TO COMPLY WITH THE REQUIREMENTS OF AS2118.
- NOTE VOID SPRINKLERS HEADS SHALL BE IN ACCORDANCE WITH THE HAZARD CLASSIFICATION REQUIRED UNDER AS2118.1-2017 AND INCORPORATE APPROVED PROTECTION METAL GUARD
- SPRINKLER CONTRACTOR TO RUN WIRING TO FIP. COORDINATE WITH ELECTRICIAN.
- EXACT POSITION OF CEILING SPRINKLER HEADS SHALL BE DETERMINED FOLLOWING INSTALLATION OF ROOF TRUSSES & CONFIRMATION OF SKYLIGHT SHAFT LOCATIONS. COORDINATE WITH OTHER SERVICES & OBTAIN APPROVAL PRIOR TO INSTALLATION.
- DENOTES FIRE STOP COLLAR WHERE PVC PIPE PENETRATES FIRE RATED WALL.
- FINAL SPACING & COVERAGE OF ROOF SPACE FIRE SPRINKLERS SHALL BE IN ACCORDANCE WITH AS2118.1 'LIGHT HAZARD' PROTECTION.
- FINAL SPACING & COVERAGE OF BELOW CEILING SPRINKLERS SHALL BE IN ACCORDANCE WITH AS2118.1.
- ALL SPRINKLER HEADS TO BE MIN 300mm FROM ANY SUPPLY AIR DIFFUSER.
- ALL SPRINKLER WITHIN 600mm OF A SUPPLY DIFFUSER TO BE RATED AT 79°C.





Rev	Date	Reason for Issue
4	21.08.24	100% ISSUE
3	02.07.24	100% ISSUE FOR REVIEW
2	19.06.24	REVISED AS REQUESTED
1	11.06.24	50% ISSUE FOR REVIEW

JC	CB	DW
JC	CB	CB
JC	CB	DW
JC	CB	Verify

Project  
**PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING**  
ANL TEA GARDENS  
PINDIMAR ROAD, TEA GARDENS, NSW 2324

Drawing Title  
**WOOD WASTE PROCESSING BUILDING**  
**FIRE SPRINKLER LAYOUT**

Discipline	Scale	Rev
<b>FIRE SPRINKLER SERVICES</b>	1:200 @ A1	
Job No. MN14834	Drawing No. FS-10-001	Rev 4

# Hydraulic Services

## PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING ANL TEA GARDENS, PINDIMAR ROAD, TEA GARDENS, NSW 2324

About Marline Engineering Newcastle

At Marline, we take a comprehensive approach when designing your new development.

With in-house electrical, mechanical and hydraulic engineers, Marline Engineering makes your engineering design needs a breeze. We are able to adjust, implement and create designs on AutoCAD and REVIT which makes it easy for contractors and builders to build our designs.

We advise you on the most affordable, practical and effective solutions and systems based on the site and legal factors.

As consulting engineers, Marline has also expanded the range of services to provide a wide range of building services disciplines including Air-conditioning, Electrical, Hydraulics, Fire Protection and Lift Services.

Marline has seen a huge amount of growth in the Energy sector. We provide services that go above and beyond the standard regulatory requirements and offer unique solutions to your Section J or JV3 Alternative solution reports. We also offer a fast NABERS and BEEC certification that ensures advertising for commercial properties are fully compliant with the CBD advertising rules and regulations.

With engineering consulting experience that dates back as far as 1975, we're one of the best engineering companies in Australia, and have developed the kind of projects that residential and commercial property developers benefit from.

Our Newcastle engineering firm continues to grow, however our team prides itself on every customer receiving the kind of high quality workmanship and personalised service that our company is known for.

To accommodate the expansion and demand for engineering services within Newcastle and throughout New South Wales, Marline Engineering has almost doubled the number of highly trained employees in the last five years.

Our engineering firm currently employs ten engineers, eight technical assistants and an office administrator. As a result, we continue to be leaders amongst engineering companies in Australia, with a large portfolio and a positive attitude.

PROJECT No:  
MN14834

CLIENT:  
WEDGETAIL PROJECT CONSULTING

MECHANICAL - ELECTRICAL - HYDRAULIC - FIRE - ENERGY - NABERS - STORMWATER - SECTION J - BEEC

DRAWING SCHEDULE

HY-00-000	COVER SHEET
HY-00-001	LEGEND & NOTES
HY-00-002	SITE SERVICES
HY-10-001	WOOD WASTE PROCESSING BUILDING - WATER LAYOUT
HY-20-001	WOOD WASTE PROCESSING BUILDING - GROUND FLOOR - SANITARY DRAINAGE LAYOUT
HY-20-002	WOOD WASTE PROCESSING BUILDING - ROOF - DRAINAGE LAYOUT
HY-30-001	DETAILS

100% ISSUE



LINETYPES - EXISTING

	eCW	COLD WATER
	eHW	HOT WATER
	eWW	WARM WATER
	eFH	FIRE HYDRANT
	eSP	FIRE SPRINKLER
	eG	GAS
	eNP	NON POTABLE
	eRW	RAINWATER REUSE
	eS	SANITARY
	eVP	VENT PIPE OFFSET
	eTW	TRADE WASTE
	eSW	STORMWATER
	eDP	STORMWATER TO RWT
	eOF	STORMWATER OVERFLOW
	eSS	SUBSOIL DRAIN
		DISUSE PIPE

LINETYPES - NEW

	COLD WATER	
	HOT WATER	
	HWF	HOT WATER FLOW
	HWR	HOT WATER RETURN
	WARM WATER	
	T	TEMPERED WATER
	HEAT TRACE	
	FIRE HYDRANT	
	SP	FIRE SPRINKLER
	GAS	
	NP	NON POTABLE
	RW	RAINWATER REUSE
	SANITARY	
	VENT PIPE OFFSET	
	TW	TRADE WASTE
	PD	PUMP DISCHARGE
	SW	STORMWATER
	DP	STORMWATER TO RWT
	BD	BALCONY DRAIN TO STORMWATER
	RC	RECYCLED/RECLAIMED WATER
	OF	STORMWATER OVERFLOW
	SS	SUBSOIL DRAIN

SYMBOLS - OTHER

	PIPEWORK CAP
	EXPANSION LOOP
	PIPEWORK PENETRATION TEE
	PIPEWORK PENETRATION RISER
	PIPEWORK PENETRATION DROPPER
	PIPEWORK DROP DOWN
	FIXTURE UNITS
	LOADING UNITS
	MEGA JOULES
	LITRES/SECOND
	FLOW ARROW
	PIPEWORK RISES
	PIPEWORK DROPS
	PIPEWORK RISES & DROPS
	SURFACE LEVEL
	PIPEWORK REDUCER

SYMBOLS - WATER

	ISOLATION VALVE
	BALANCING VALVE
	CHECK VALVE
	REFLUX VALVE IN SHAFT WITH INSPECTION OPENING
	WATER VALVE IN PATH BOX
	CIRCULATING PUMP
	DUAL CHECK VALVES
	REDUCES PRESSURE ZONE DEVICE
	THERMOSTATIC MIXING VALVE
	TEMPERING VALVE
	THERMOSTATIC MIXING VALVE IN WALL BOX
	TEMPERING VALVE IN WALL BOX
	MAIN WATER METER
	PRIVATE WATER METER
	MICRON FILTER
	HOT WATER STORAGE UNIT

SYMBOLS - SANITARY

	AIR ADMITTANCE VALVE
	FLOOR WASTE
	BASKET FLOOR WASTE
	CHROME PLATED BRASS SCREWED CAP
	SEALED FLOOR WASTE
	OVERFLOW GULLY
	CLEAR OUT/INSPECTION OPENING
	SANITARY FIXTURE
	INSPECTION SHAFT
	INSPECTION SHAFT WITH BOUNDARY TRAP
	INDUCT PIPE MICA FLAP
	TUNDISH ON WALL
	TUNDISH INWALL
	SEWER ACCESS CHAMBER
	SEWER MAINTENANCE SHAFT
	PLASTER TRAP
	SWIVEL EXPANSION JOINT
	PIPEWORK CAST IN BEAM
	BUNDED AREA

SYMBOLS - STORMWATER

	GRATED DRAIN
	GRATED PIT
	SEALED PIT
	DOWNPIPE WITH SPREADER

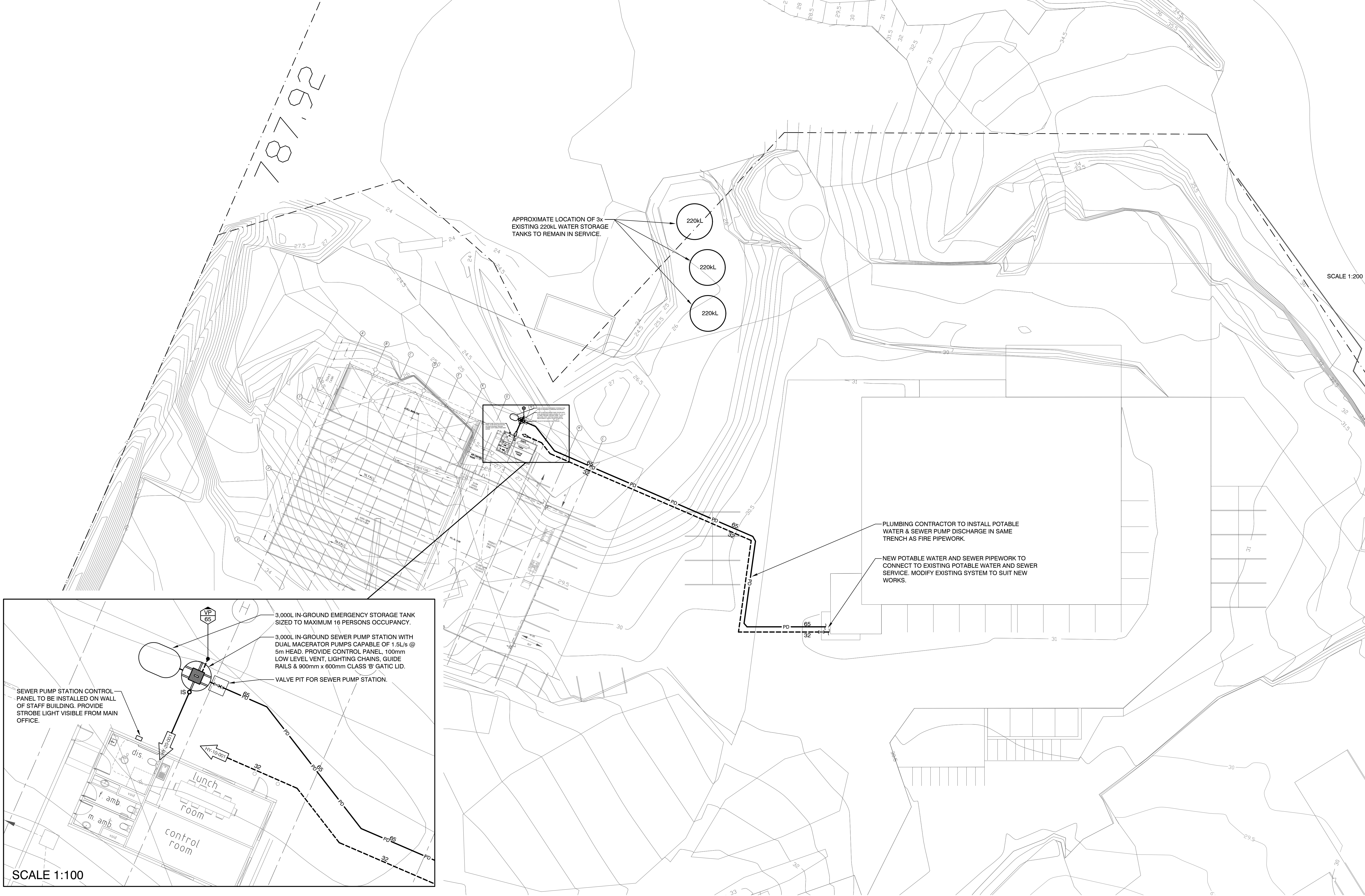
ABBREVIATIONS

AT	ART TROUGH.
ACU	AIR CONDITIONING UNIT.
AAV	AIR ADMITTANCE VALVE.
B	BATH.
BFW	BUCKET FLOOR WASTE.
BKS	BUCKET SINK.
BS	BAR SINK.
BID	BIDETTE.
BT	BOUNDARY TRAP.
BWU	BOILING WATER UNIT.
CD	CONDENSATE DRAIN.
CO	CLEAROUT.
CPC	CHROME PLATED BRASS SCREWED CLEAROUT.
CS	CLEANERS SINK.
DCV	DOUBLE CHECK VALVE (TESTABLE).
DE	DIESEL EXHAUST.
DF	DRINKING FOUNTAIN.
DN	DIAMETER NOMINAL.
DG	DISCONNECTOR GULLY.
DP	DOWNPIPE.
DPH	DOUBLE PILLAR HYDRANT.
DT	DRINKING TROUGH.
DUCV	DUAL CHECK VALVE.
DW	DISHWASHER.
e	EXISTING.
ED	ELEVATED DRAINAGE.
eSAC	EXISTING SEWER ACCESS CHAMBER.
eSWP	EXISTING STORMWATER PIT.
EW	EYE WASH.
FC	FUME CUPBOARD.
FH	FIRE HYDRANT.
FL	FLOOR LEVEL.
FS	FLUSHER SANITIZER.
FSL	FINISHED SURFACE LEVEL.
FU	FIXTURE UNITS.
FW	FLOOR WASTE.
GB	GAS BAYONET.
GCH	GAS CONVECTION HEATER.
GCT	GAS COOK TOP.
GD	GRATED DRAIN.
GW	GLASS WASHER.
Hb	HANDBASIN.
HT	HOSE TAP.
HWC	HUNTER WATER CORPORATION.
HWU	HOT WATER UNIT.
IL	INVERT LEVEL.
IM	ICE MACHINE.
IO	INSPECTION OPENING.
IS	INSPECTION SHAFT.
IPMF	INDUCT PIPE MICA FLAP.
KIP	KERB INLET PIT.
LPG	LIQUID PETROLEUM GAS.
LS	LABORATORY SINK.
NG	NATURAL GAS.
OG	OVERFLOW GULLY.
PA	PLASTER ARRESTOR.
PAT	PRACTICAL ACTIVITIES TROUGH.
PLD	PLANTER DRAIN.
RL	RELATIVE LEVEL.
RPZD	REDUCED PRESSURE ZONE DEVICE.
RWO	RAIN WATER OUTLET.
RV	REFLUX VALVE.
SAC	SEWER ACCESS CHAMBER.
Shr	SHOWER.
SH	SLOP HOPPER.
SHr	SEALED FLOOR WASTE.
SL	SURFACE LEVEL.
SMS	SEWER MAINTENANCE SHAFT.
Snk	KITCHEN SINK.
SPH	SINGLE PILLAR HYDRANT.
SPR	RAINWATER SPREADER.
SShr	SAFETY SHOWER.
SS	SOIL STACK.
ST	STERILIZER.
SVS	SPRINKLER VALVE SET.
T	TUBS.
TD	TUNDISH.
TMV	THERMOSTATIC MIXING VALVE.
TWV	TRADE WASTE VENT.
UR	URINAL.
Vb	VANITY BASIN.
VP	VENT PIPE.
Wc	WATER CLOSET.
WD	WINDOW DRENCHER.
WM	WASHING MACHINE.
WS	WASTE STACK.
WT	WASH TROUGH.

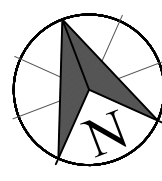
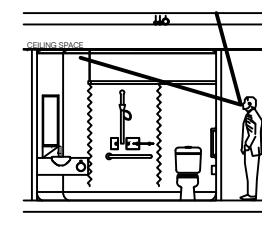
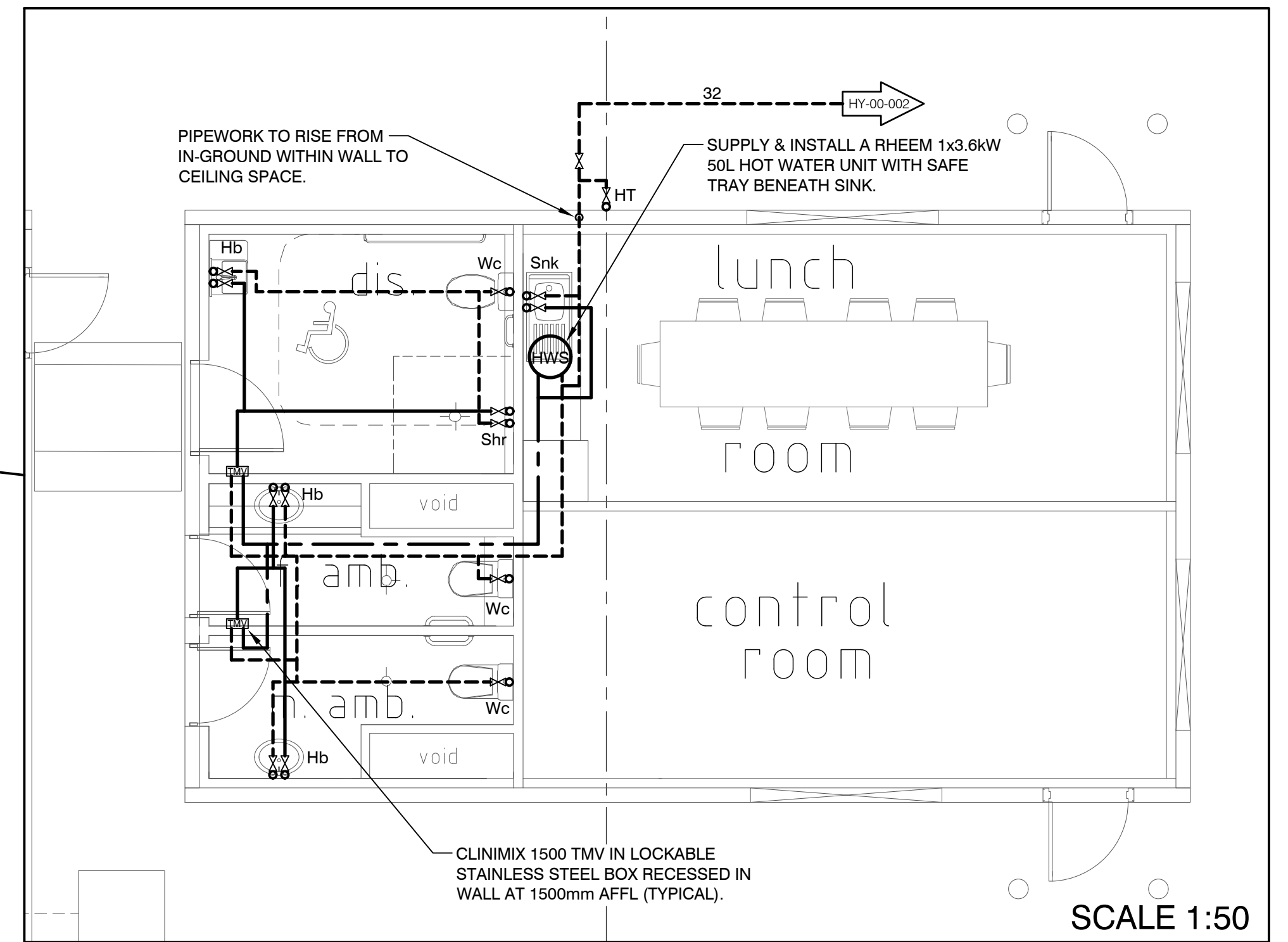
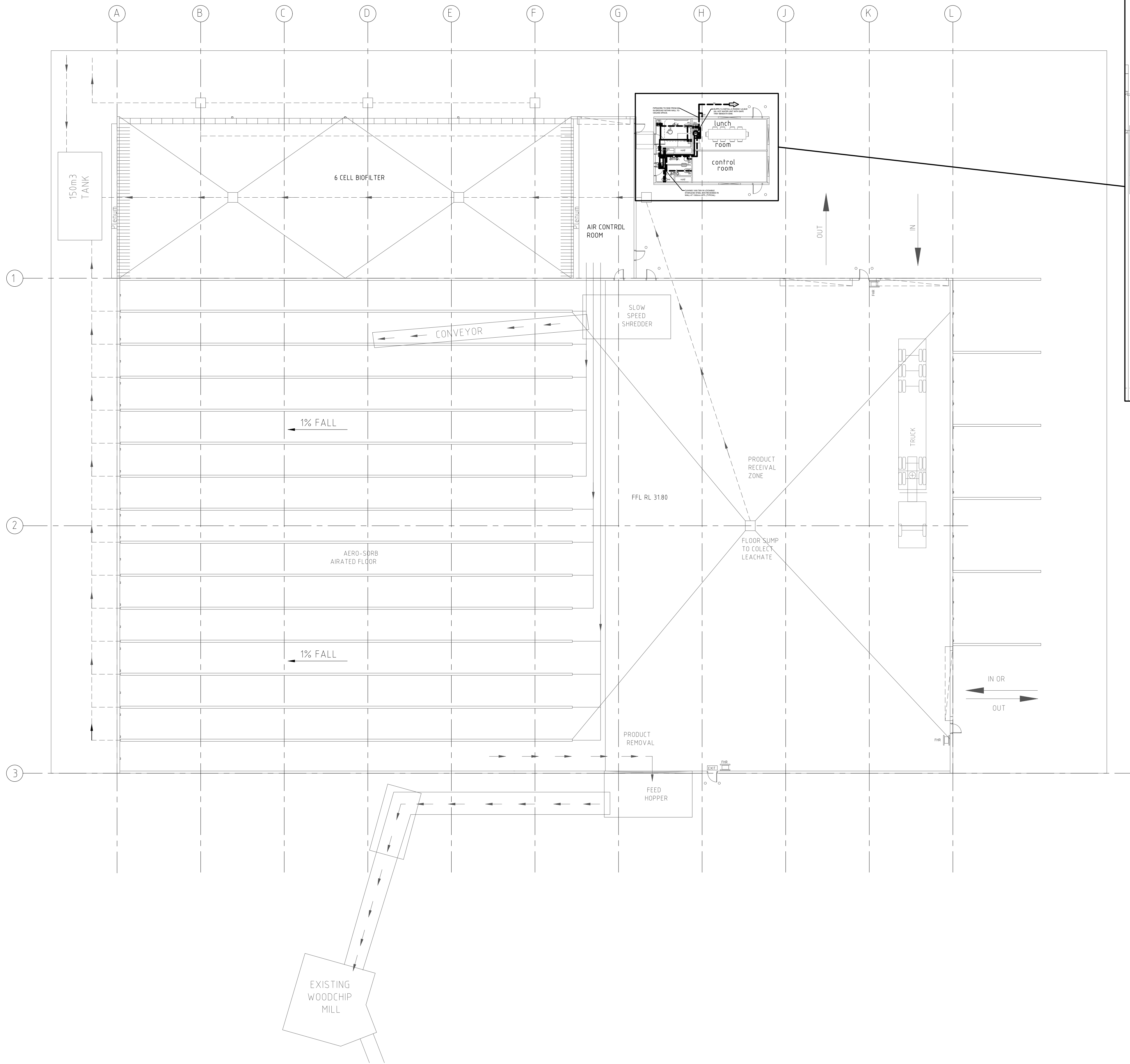
GENERAL NOTES

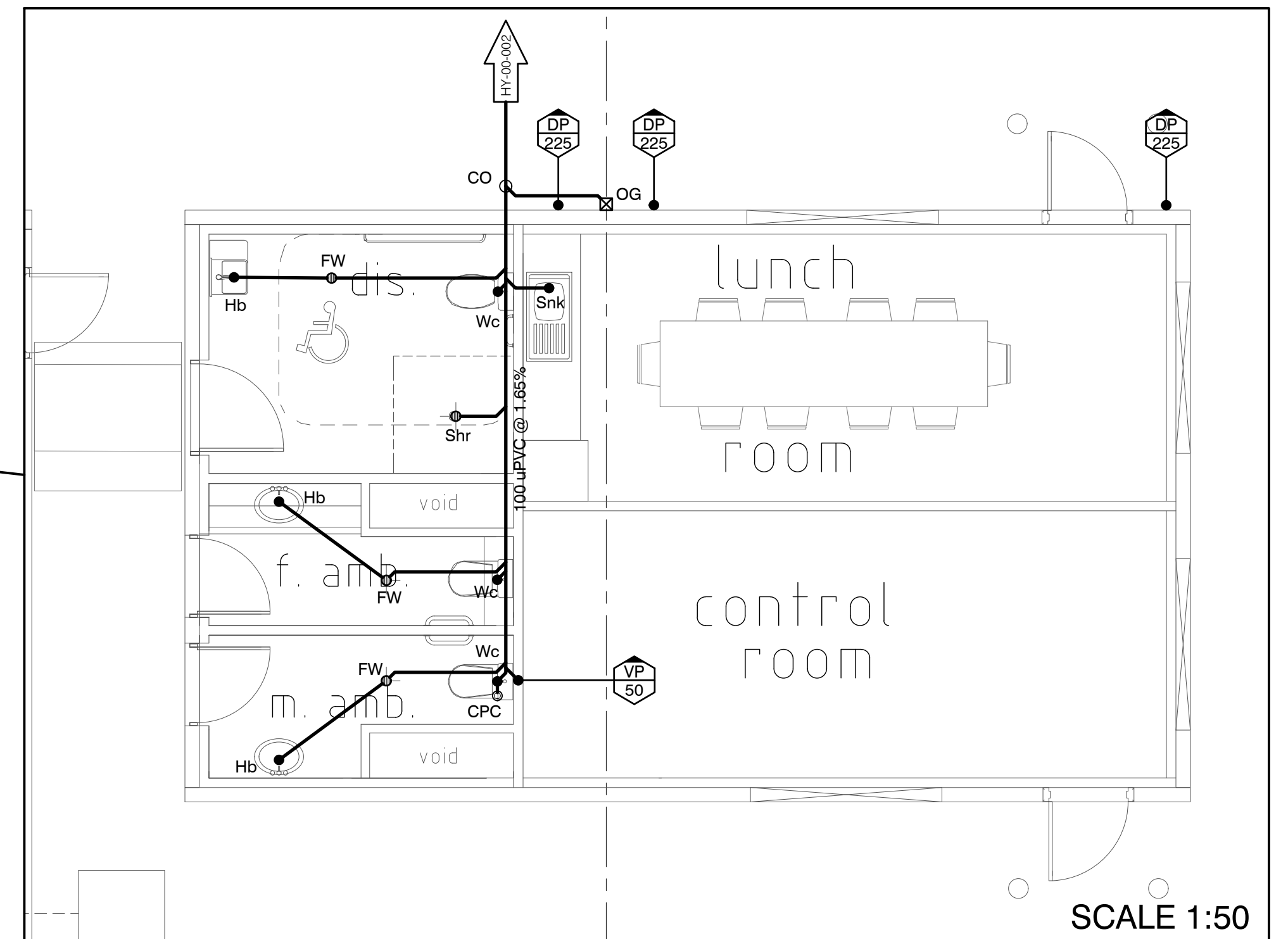
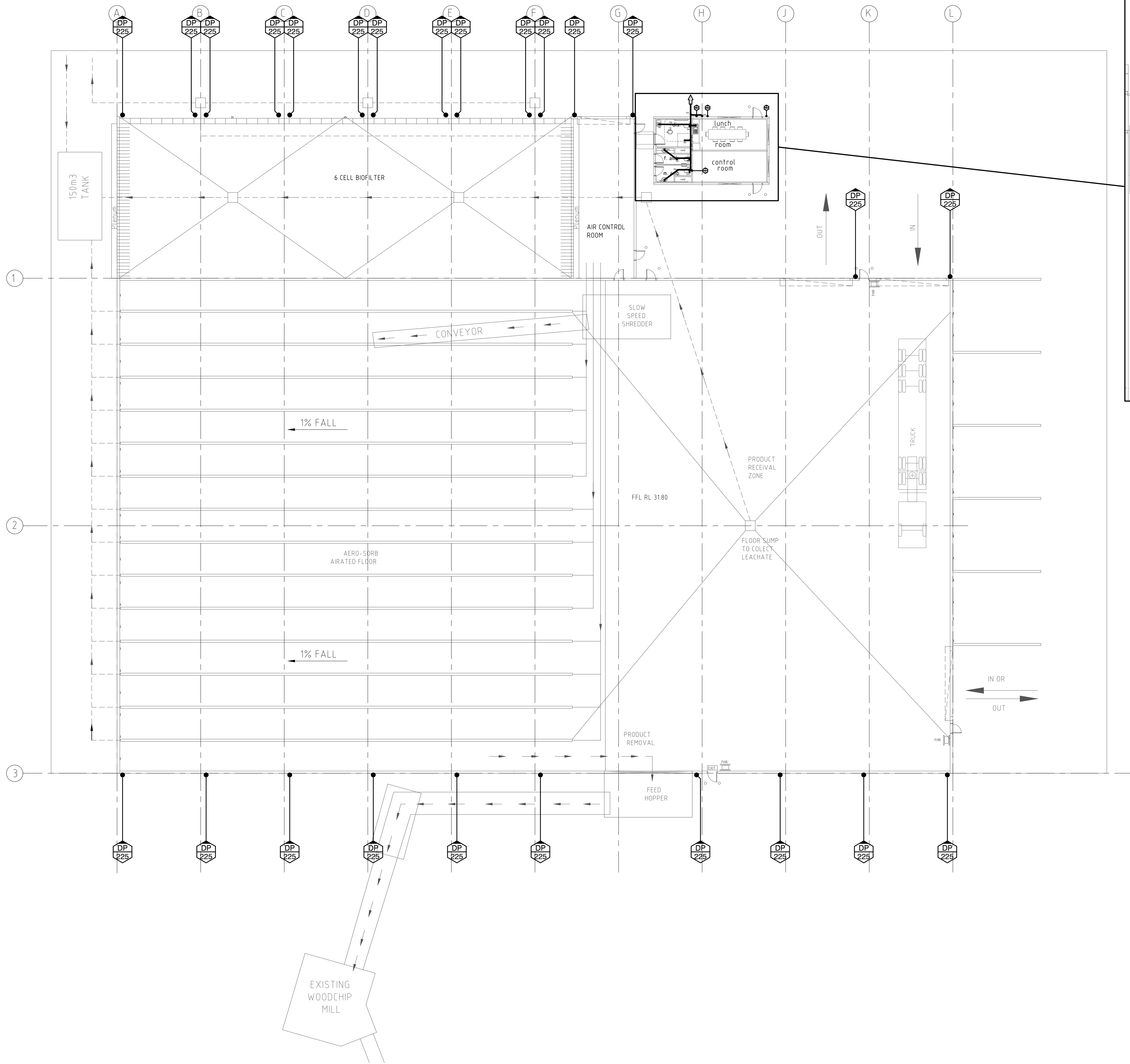
- IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN A 'DIAL BEFORE YOU DIG' TO ASCERTAIN THE FULL EXTENT OF EXISTING SERVICES SURROUNDING THE SUBJECT PROPERTY. PRIOR TO ANY EXCAVATION THE RELEVANT AUTHORITIES eg TELSTRA OPTUS, AGILITY etc. ARE TO BE NOTIFIED OF ALL WORKS.
- ALLOW TO PAY ALL FEES & CHARGES FOR ALL AUTHORITIES RELATING TO ALL WORKS DESIGNED & SPECIFIED.
- IT IS THE HYDRAULIC CONTRACTORS RESPONSIBILITY TO ENGAGE A SUITABLE QUALIFIED CONTRACTOR TO CARRY OUT A THOROUGH GROUND SEARCH FOR EXISTING SERVICES AROUND AND IN THE PROPOSED BUILDING FOOTPRINT. NOTIFY THE SUPERINTENDENT IMMEDIATELY IF ADDITIONAL SERVICES TO THAT DOCUMENTED ARE LOCATED. THIS IS TO BE CARRIED OUT PRIOR TO ANY WORKS BEING COMMENCED.
- ALL HOT, WARM & COLD WATER ISOLATION VALVES SHOWN ARE TO BE LOCATED IN THE CEILING VOID COMPLETE WITH ACCESS PANEL OTHERWISE 300mm DOWN FROM CEILING IN ROOM USING ENWARE VP356 ISOLATION VALVE WITH CHROME COVERPLATE.
- ALL EXPOSED PIPEWORK TO BE CHROME PLATED OR PAINTED AS PER SPECIFICATION.
- ALLOW TO PREPARE & SUPPLY DETAILED 'AS INSTALLED' DRAWINGS & MAINTENANCE MANUALS FOR ALL ASSOCIATED WORKS AS DETAILED IN THE SPECIFICATION.
- SUPPLY & INSTALL FIRE STOP COLLARS etc. TO COMPLY WITH AS4072.1 TO MAINTAIN THE FIRE RATING INTEGRITY OF THE BUILDING ELEMENT BEING PENETRATED. THE COLLARS MUST COMPLY WITH ALL CLAUSES / PARTS OF AS4072.
- CONTRACTOR TO ENSURE THAT HYDRAULIC SERVICE PENETRATIONS THROUGH FIRE RATED WALLS/CEILINGS & OTHER FIRE RATED ELEMENTS ARE PROTECTED AND MEET THE REQUIREMENTS OF SPECIFICATION 13 OF THE NCC 2022
- ALL HYDRAULIC SERVICES PIPEWORK, EQUIPMENT & VALVES SHOULD BE LABELED TO ENABLE THEM TO BE CLEARLY IDENTIFIED. LOCATIONS OF LABELS TO BE APPROVED BY ARCHITECT.
- ALL HOT/WARM WATER PIPEWORK TO BE INSULATED WITH THERMOTEC INSULATION OR EQUIVALENT WITH R-VALUE ≥ 0.6 IN ACCORDANCE WITH AS/NZS 3500.4. REFER TO SPECIFICATION FOR EXACT REQUIREMENTS.
- ALL DISRUPTIONS TO EXISTING SERVICES FOR NEW CONNECTIONS ARE TO BE COORDINATED ON SITE WITH THE PROJECT SUPERINTENDENT.
- ALL INWALL TUNDISH ARE TO BE MODTEC OR EQUIVALENT. REFER TO DETAILS.
- ALL EXTERNAL HOSE TAPS TO BE ENWARE KEY OPERATED HOSE TAPS FITTED WITH VACUUM BREAKERS.
- ALL LEVELS & LOCATIONS SHOWN ON DRAWINGS FOR EXISTING PITS, SERVICES, SEWER ACCESS CHAMBERS & KERB INLET PITS ARE TO BE CONFIRMED ON SITE PRIOR TO ANY WORKS BEING CARRIED OUT.
- ISOLATION VALVE AT WATER METER ASSEMBLY TO BE SECURED IN THE OPEN POSITION BY A PADLOCKED METAL STRAP AND AN ENGRAVED NON FERROUS METAL LABEL ATTACHED. LABEL TO BE ENGRAVED WITH 8mm UPPER CASE WORDING: 'FIRE SERVICE VALVE - CLOSE ONLY TO SERVICE FIRE HOSE REELS'.
- ALL SERVICES INSTALLED ADJACENT THE BUILDING ARE TO BE LOCATED OUTSIDE THE ZONE OF INFLUENCE AS PER AS3500.
- ALL HYDRANT PIPEWORK TO BE BLUE BRUTE CLASS 16 INGROUND OR GALVANIZED STEEL ABOVE GROUND TO COMPLY WITH AUSTRALIAN STANDARDS. ALL BLUE BRUTE PIPEWORK TO BE SUPPORTED BY THRUST BLOCKS.
- ALL LOCATIONS OF WATER POINTS FOR INTERNAL FITOUT SHOWN ON THESE PLANS ARE FOR CLARITY ONLY. FINAL LOCATIONS ARE TO BE DETERMINED USING ARCHITECTURAL 1:50 INTERNAL LAYOUTS & ELEVATIONS.
- SANITARY DRAINAGE OVERFLOW GULLIES TO BE PROVIDED IN ACCORDANCE WITH AS3500.2 REQUIREMENTS. IF HEIGHTS IN ACCORDANCE WITH AS3500.2.4.6.6.6 CANNOT BE ACHIEVED REFLUX VALVES MUST BE INSTALLED.
- WHERE PIPEWORK IS LIKELY TO BE EXPOSED TO FIRE IN AN AREA WITHIN A BUILDING THAT IS NOT PROTECTED BY SPRINKLERS, PIPE-SUPPORTS SHALL BE INSTALLED WITH A MINIMUM FRL NOT LESS THAN 60/-/. THE PIPE-SUPPORTS ARE REQUIRED TO HAVE A TEMPERATURE RESISTANCE OF NOT LESS THAN 500°C WHEN TESTED IN ACCORDANCE WITH AS1530.4.



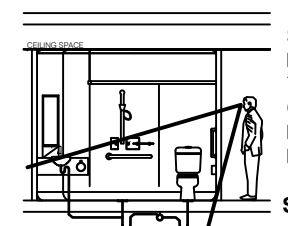






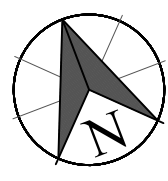


NOTE:  
STORMWATER DOWNPIPES TO CONNECT TO  
IN-GROUND CIVIL STORMWATER SYSTEM.  
REFER TO CIVIL DOCUMENTATION.



SANITARY PLUMBING, DOWNPIPES, ETC. SERVING THIS FLOOR SUSPENDED IN CEILING SPACE OF FLOOR BELOW OR INSTALLED BELOW FLOOR SLAB

**SERVICES ORIENTATION**



2	21.08.24	100% ISSUE
1	09.07.24	90% ISSUE
Rev	Date	Reason for Issue

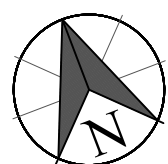
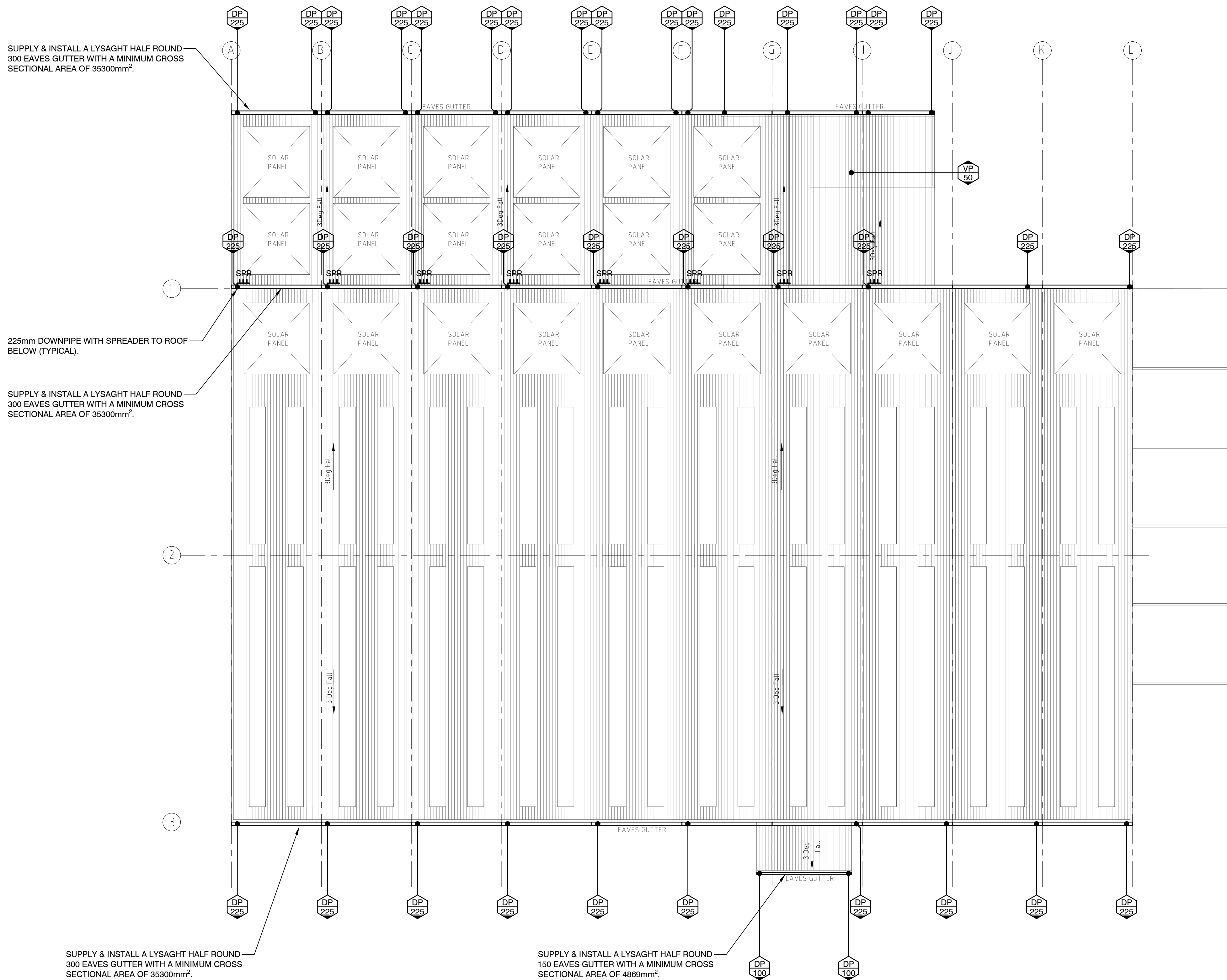
CM	CB	DW
Drawn	Design	Verify

Project  
**PROPOSED EXTENSION WOOD WASTE PROCESSING BUILDING**  
ANL TEA GARDENS  
PINDIMAR ROAD, TEA GARDENS, NSW 2324

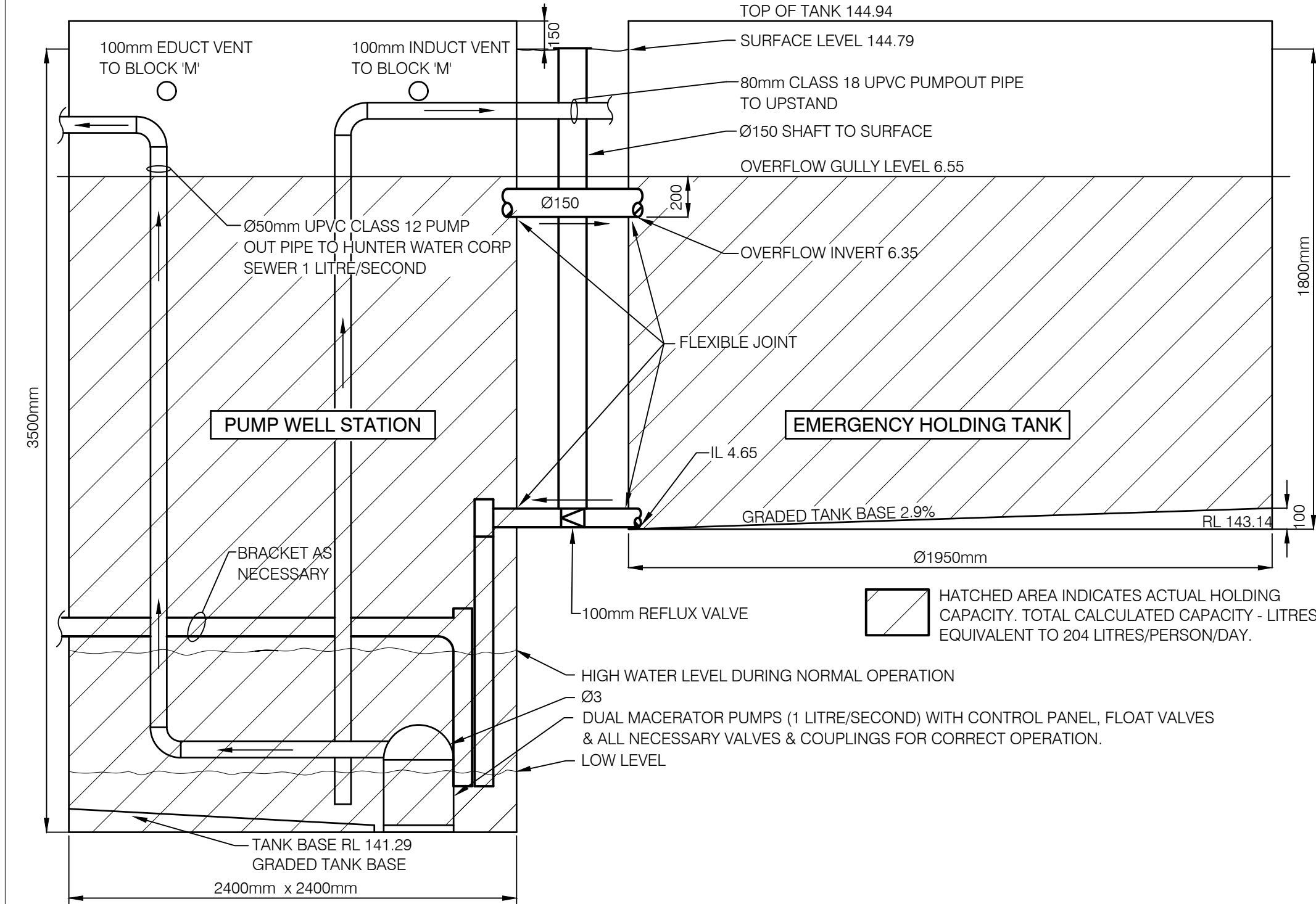
Drawing Title  
**WOOD WASTE PROCESSING BUILDING - GROUND FLOOR SANITARY DRAINAGE LAYOUT**

Discipline  
**HYDRAULIC SERVICES**

Job No. Drawing No. Rev  
MN14834 HY-20-001 2

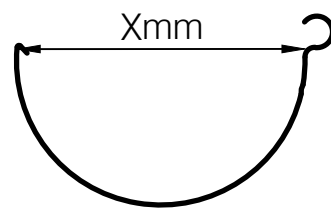






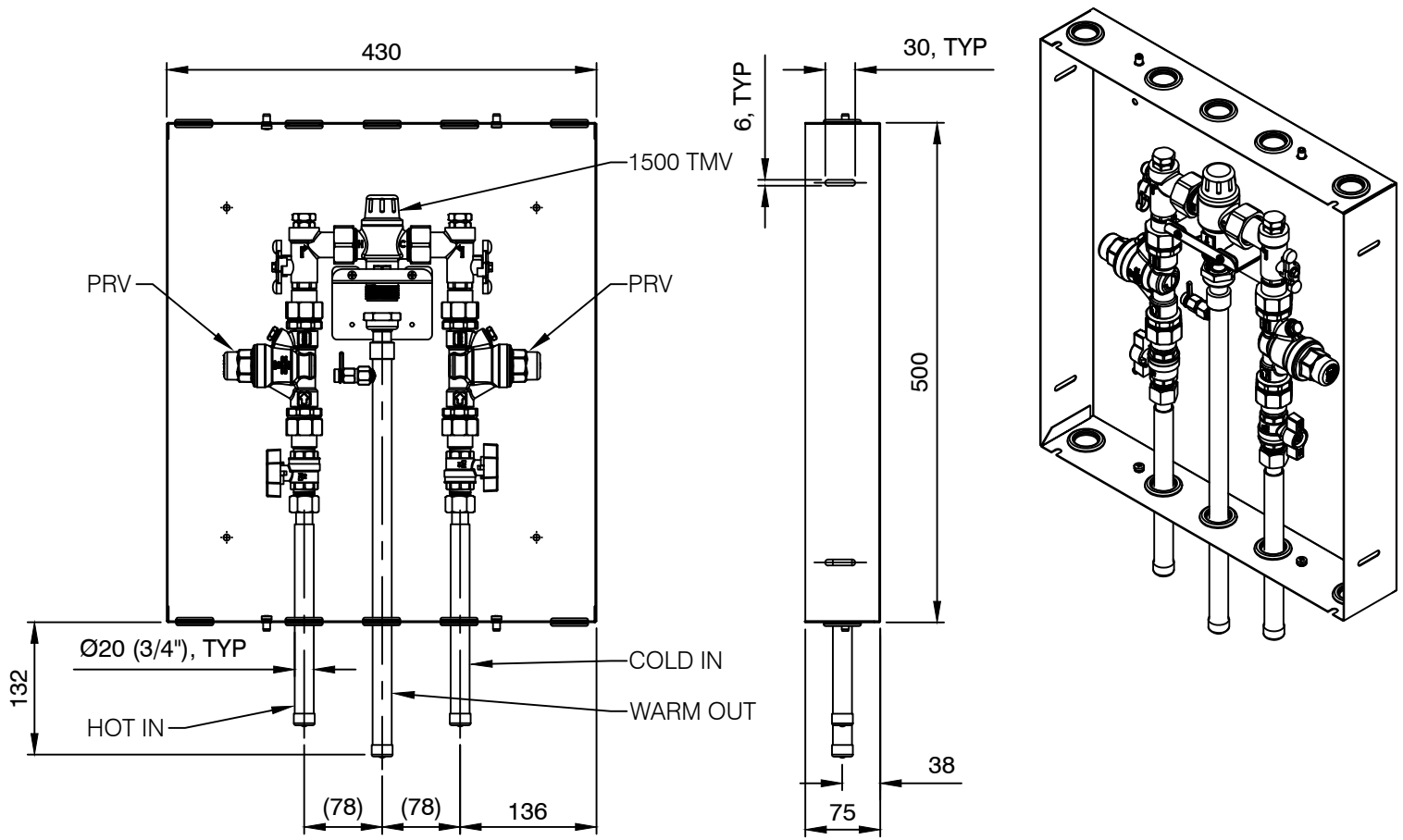
**PUMP WELL AND HOLDING TANK SECTION DETAIL**

- NOTES:
- PUMPS TO BE ON BRACKETED SLIDING RAILS WITH CHAINS TO TOP OF PUMP STATION.
  - TANKS TO BE FITTED WITH STAINLESS STEEL STEP IRONS.

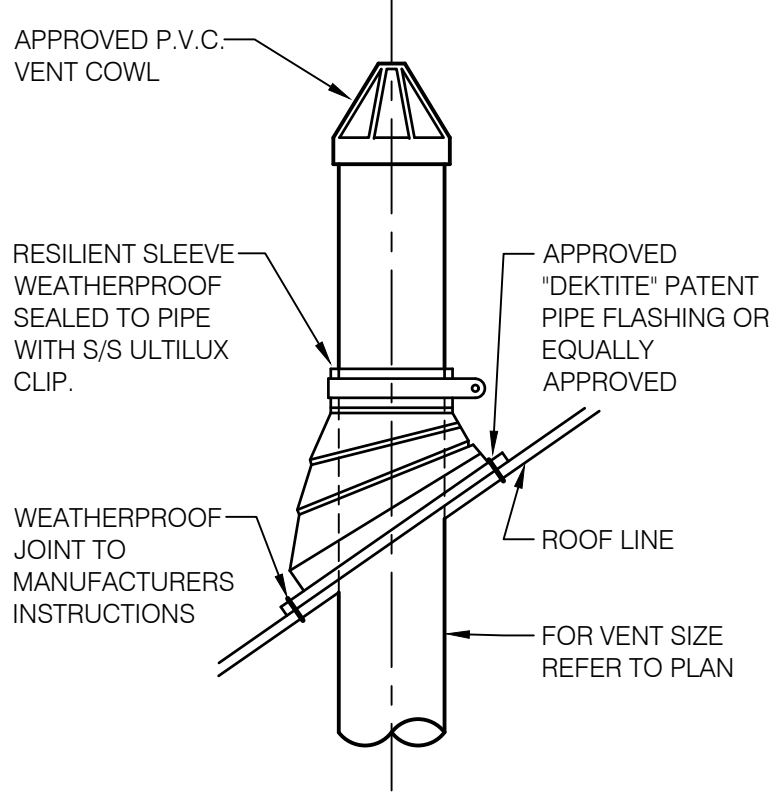


GUTTER	X	HALF ROUND GUTTER CROSS SECTIONAL AREA mm <sup>2</sup>
HALF ROUND	100	4300mm <sup>2</sup>
HALF ROUND	125	6300mm <sup>2</sup>
HALF ROUND	150	9200mm <sup>2</sup>
HALF ROUND	200	14500mm <sup>2</sup>
HALF ROUND	250	24500mm <sup>2</sup>
HALF ROUND	300	35300mm <sup>2</sup>

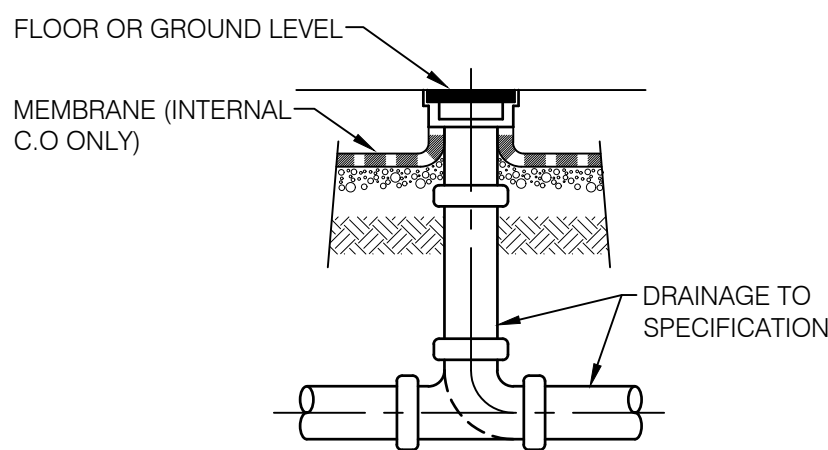
**LYSAGHT HALF ROUND GUTTER**



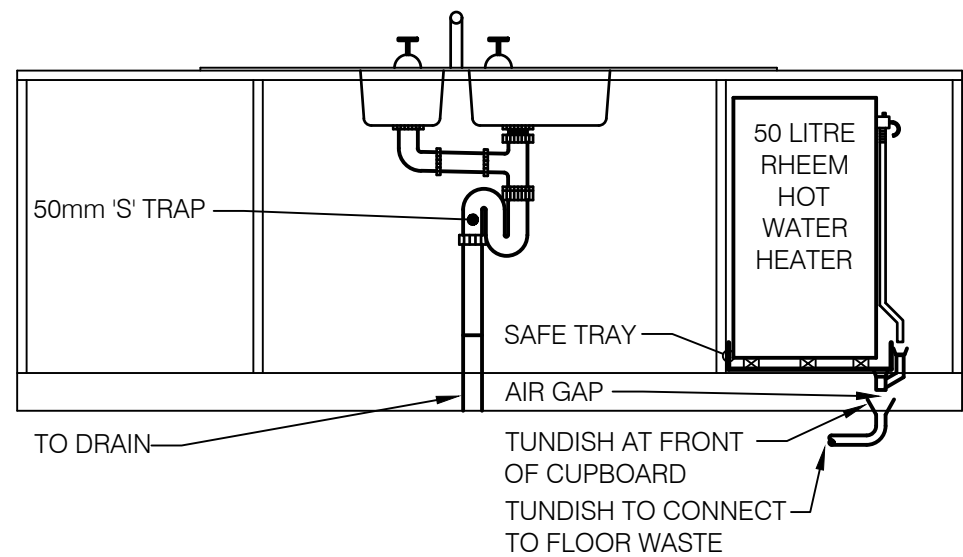
**THERMOSTATIC WATER MIXING VALVE & WATER CONNECTIONS**



**TYPICAL VENT TERMINATION DETAIL**



**TYPICAL CLEAROUT**



**50 LITRE HOT WATER HEATER UNDER SINK**





21 August 2024  
Ref No: MN14834

Wedgetail Project Consulting  
27 Groves Road  
Bennetts Green NSW 2290

Attention: Shaun Smith

**RE: Proposed extension Wood Waste Processing Building - ANL Tea Gardens - Pindimar Rd Tea Gardens  
CERTIFICATE OF DESIGN – ELECTRICAL SERVICES**

**SUBJECT PREMISES: Pindimar Road Tea Gardens NSW 2324**

Pursuant to the provisions of **Clause A2G1 and A5G3 of the Building Code of Australia**, I hereby certify that the above design is in accordance with normal engineering practice and meets the requirements of the Building Code of Australia, Environmental Planning and Assessment Regulations, relevant Australian Standards and relevant conditions of Development Consent. In particular the design is in accordance with the following:

**Fire Detection For Automatic Shutdown**

**NCC 2022 NSW Clause E2D16, NCC 2022 Specification 20 Clause S20C6, and AS 1670.1-2018**

**Building Occupant Warning System**

**NCC 2022 NSW Clause S20C7, and AS 1670.1-2018**

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above and which are detailed on the following drawings.

Dwg No.	Title	Revision
FD-00-000	COVER SHEET	4
FD-00-001	LEGEND & NOTES	4
FD-10-001	WOOD WASTE PROCESSING BUILDING - FIRE DETECTION	4

**MECHANICAL · ELECTRICAL · HYDRAULIC · FIRE · ENERGY · NABERS · STORMWATER · SECTION J · BEEC**

Marline Newcastle Pty Ltd  
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ACN 612 456 381  
[www.marline.com.au](http://www.marline.com.au)

Managing Director Brendan Maher, AMIEAust, NER  
Director Daniel White, BE (Hons), B.BUS, MIEAust

Unit F 56 Clyde Street  
Hamilton North NSW 2292  
P 02 4925 9300  
[mail@marline.com.au](mailto:mail@marline.com.au)

Marline Newcastle possesses Indemnity Insurance to the satisfaction of the building owner.

**Designer:** Josiah Hosking

**Qualifications:** B.Eng. (Electrical and Electronic)  
MIEAust NER  
FPAS – Competent Fire Safety Practitioner (F054289D)  
NSW Registered Professional Engineer (PRE0000410)  
Regulated Design Practitioner – Fire Systems (detection and alarm systems)  
(DEP0001241)  
Regulated Design Practitioner – Electrical Engineering (DEP0001241)

**Address:** Unit F 56 Clyde Street, Hamilton North, NSW 2292

**Phone:** 02 4925 9300

**Company:** Marline Newcastle Pty Ltd

**Signature:**

A handwritten signature in black ink, appearing to read "Josiah Hosking". The signature is fluid and cursive, with the first name "Josiah" being more prominent than the last name "Hosking".



21 August 2024  
Ref No. MN14834

Wedgetail Project Consulting  
27 Groves Road  
Bennetts Green NSW 2290

Attention: Shaun Smith

**RE: Proposed extension Wood Waste Processing Building - ANL Tea Gardens - Pindimar Rd Tea Gardens  
CERTIFICATE OF DESIGN – HYDRAULIC SERVICES**

**SUBJECT PREMISES: Pindimar Road Tea Gardens NSW 2324**

Pursuant to the provisions of **Clause A2G1 and A5G3 of the Building Code of Australia**, I hereby certify that the above design is in accordance with normal engineering practice and meets the requirements of the Building Code of Australia, Environmental Planning and Assessment Regulations, relevant Australian Standards and relevant conditions of Development Consent. In particular the design is in accordance with the following:

<b>Fire Hose Reels</b>	<b>NCC 2022 Clause E1D3 and AS 2441 – 2005</b>
<b>Fire Hydrant Systems</b>	<b>NCC 2022 Clause E1D2 and AS 2419.1 – 2021</b>
<b>Building Hydraulic Systems:</b>	
- <b>Cold Water</b>	<b>AS/NZS 3500.01: 2021</b>
- <b>Sanitary Plumbing and Drainage</b>	<b>AS/NZS 3500.02: 2021</b>

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above and which are detailed on the following drawings.

<b>Dwg No.</b>	<b>Title</b>	<b>Revision</b>
HY-00-000	COVER SHEET	2
HY-00-001	LEGEND & NOTES	2
HY-00-002	SITE SERVICES	2
HY-10-001	WOOD WASTE PROCESSING BUILDING - WATER LAYOUT	2
HY-20-001	WOOD WASTE PROCESSING BUILDING - GROUND FLOOR - SANITARY DRAINAGE LAYOUT	2
HY-20-002	WOOD WASTE PROCESSING BUILDING - ROOF - DRAINAGE LAYOUT	2
HY-30-001	DETAILS	2
FH-00-000	COVER SHEET	4
FH-00-001	LEGEND & NOTES	4
FH-00-002	SITE SERVICES	4
FH-10-001	WOOD WASTE PROCESSING BUILDING - FIRE SERVICES LAYOUT	4
FH-20-001	DETAILS - SHEET 1	4
FH-20-002	DETAILS - SHEET 2	4

**MECHANICAL · ELECTRICAL · HYDRAULIC · FIRE · ENERGY · NABERS · STORMWATER · SECTION J · BEEC**

Marline Newcastle possesses Indemnity Insurance to the satisfaction of the building owner.

**Designer:** Daniel White

**Qualifications:** B.Eng. (Mechanical), B.Bus.

MIEAust CPEng NER

Accredited Fire Practitioner – Hydraulic (BDC 04520)

NSW Registered Professional Engineer (PRE0000141)

Regulated Design Practitioner – Drainage (DEP0000330)

Regulated Design Practitioner – Fire Systems (fire sprinkler) (DEP0000330)

Regulated Design Practitioner – Fire Systems (fire hydrant and fire hose reel)  
(DEP0000330)

**Address:** Unit F 56 Clyde Street, Hamilton North, NSW 2292

**Phone:** 02 4925 9300

**Company:** Marline Newcastle Pty Ltd

**Signature:**

A handwritten signature in black ink, appearing to read "Daniel White", with a long horizontal flourish extending to the right.



21 August 2024

Ref No: MN14834

Wedgetail Project Consulting  
27 Groves Road  
Bennetts Green NSW 2290

Attention: Shaun Smith

**RE: Proposed extension Wood Waste Processing Building - ANL Tea Gardens -  
Pindimar Rd Tea Gardens  
CERTIFICATE OF DESIGN INTENT – SPRINKLER SERVICES**

**SUBJECT PREMISES: Pindimar Road Tea Gardens NSW 2324**

Pursuant to the provisions of **Clause A2G1 and A5G3 of the Building Code of Australia**, I hereby certify that the above design will be in accordance with normal engineering practice and meets the requirements of the Building Code of Australia, Environmental Planning and Assessment Regulations, relevant Australian Standards and relevant conditions of Development Consent. In particular the design will be in accordance with the following:

**Fire Sprinklers**

**NCC 2022 Clause E1D4 and AS 2118.6 – 2017**

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above and which are detailed on the following drawings.

Dwg no.	Title	Revision
FS-00-000	COVER SHEET	4
FS-00-001	LEGEND & NOTES	4
FS-10-001	WOOD WASTE PROCESSING BUILDING - FIRE SPRINKLER LAYOUT	4

**MECHANICAL · ELECTRICAL · HYDRAULIC · FIRE · ENERGY · NABERS · STORMWATER · SECTION J · BEEC**





Marline Newcastle possesses Indemnity Insurance to the satisfaction of the building owner.

**Designer:** Daniel White

**Qualifications:** B.Eng. (Mechanical), B.Bus.

MIEAust CPEng NER

Accredited Fire Practitioner – Hydraulic (BDC 04520)

NSW Registered Professional Engineer (PRE0000141)

Regulated Design Practitioner – Drainage (DEP0000330)

Regulated Design Practitioner – Fire Systems (fire sprinkler) (DEP0000330)

**Address:** Unit F 56 Clyde Street, Hamilton North, NSW 2292

**Phone:** 02 4925 9300

**Company:** Marline Newcastle Pty Ltd

**Signature:**

A handwritten signature in black ink, appearing to read "Daniel White", with a stylized flourish at the end.

MECHANICAL · ELECTRICAL · HYDRAULIC · FIRE · ENERGY · NABERS · STORMWATER · SECTION J · BEEC