

**ENVIRONMENTAL IMPACT STATEMENT
HALA ALAMEDDINE
99 SARGENTS ROAD, EBENEZER**

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Engineering a Sustainable Future for Our Environment

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Submission of**environmental impact statement (EIS)**

prepared under the Environmental Planning and Assessment Act 1979 Section 78(A)

EIS prepared by

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in respect of

development application

applicant name	Hala Constructions Pty Ltd
applicant address	
land to be developed:	99 Sargents Road Ebenezer, NSW, 2756
address	
lot no, DP/MPS, vol/fol etc	Lot 288
proposed development	DP751665

or

☐ map(s) attached**environmental impact statement**☒ an environmental impact statement (EIS) is attached**certificate**

I certify that I have prepared the contents of this Statement and to the best of my knowledge

- it is in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000,
- contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and
- the information contained in the statement is neither false nor misleading.

signature



name

Richard T Benbow

date

3 April 2020

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Linda Zanotto	Benbow Environmental	Project Manager Executive Summary, Description of Proposal, Planning Assessment, Waste, Water and soil, Justification, Alternatives, Description of Proposal, Environmental Impact Statement Compilation
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Damien Thomas	Benbow Environmental	Acid Sulfate Soil Assessment Phase I Environmental Site Assessment
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Muna Pradhan	BMB Engineers	Flood Impact Assessment Report Flood Management Report
Catherine Gorrie	Bushfire Consulting Services Pty Ltd	Bushfire Assessment Report
Joey Ellis	Baini Design	Site Plan, Ground Floor Plan, Building Elevations
Alexander Graham Jack Tatler	Narla Environmental Pty Ltd	Biodiversity Development Assessment Report (Streamlined Assessment)
Rob Peterson Kha Nguyen	Indesco Consult Australia	Concept Design Set – Civil Engineering

Victor Molyneaux	Horticultural Resources Consulting Group	Arboricultural Implication Assessment Tree Management Plan
Joe Bacha	Australian Consulting Engineers	Stormwater Concept Plan
	C&A Surveyors NSW Pty Ltd	Survey Plan
	JALA Designs	Landscape Plan

ABBREVIATIONS USED IN THIS REPORT

ADG code	Australian code for the Transport of Dangerous Goods by Road and Rail
AHD	Australian Height Datum
AMMAAP	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW
ARI	Average Recurrence Interval – the average or expected value of the period between exceedances of a given rainfall event or discharge
BCA	Building Code of Australia
BOM	Bureau of Meteorology
DA	Development Application
DCP	Development Control Plan
DPI	Department of Primary Industry
DNR	Department of Natural Resources
DoP	Department of Planning
DoP&E	Department of Planning and Environment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cmth)
EPL	Environment Protection Licence
ESD	Ecological Sustainable Development
FRL	Fire Resistance Level
INP	Industrial Noise Policy (guidelines developed by the EPA)
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
Mbgl	Metres below ground level
NES	National Environmental Significance
NPI	National Pollutant Inventory
NRC	Natural Resources Commission
NOW	New South Wales Office of Water
NSW	New South Wales
NSW EPA	New South Wales Environment Protection Authority
OSD	On-site detention
PM ₁₀	Particulate matter of size 10 µm
PM _{2.5}	Particulate matter of size 2.5 µm
RBL	Rating background level
RNP	NSW EPA Road Noise Policy
RSD	Roller Shutter Door
RMS	Roads and Maritime Services
RTA	Roads and Traffic Authority (now known as RMS)
SEPP	State Environmental Planning Policy
Tpa	Tonnes per annum
TSC Act	Threatened Species Conservation Act 1995
TSP	Total suspended particulates
VENM	Virgin Excavated Natural Material

UNITS OF MEASUREMENT

°C	degree centigrade	(unit of temperature)
dB(A)	A-weighted decibels	(unit of noise)
dB(lin)	Linear-weighted decibels	(unit of noise)
ha	hectares	(unit of area)
g	gram	(unit of mass)
kg	kilogram	(unit of mass)
kL	kilolitre	(unit of volume)
KPa	kilopascal	(unit of pressure)
km	kilometre	(unit of length)
KT	kilo Tonnes	(unit of mass)
Mt	million tonnes	(unit of mass)
m	metre	(unit of length)
m ²	squared metre	(unit of area)
m ³	cubic meter	(unit of volume)
OU	odour unit	(unit of odour)
T	Tonne (1000 kg)	(unit of mass)
µg	microgram	(10 ⁻⁶ gm – unit of mass)
µg/m ³	microgram/cubic meter	(concentration)



EXECUTIVE SUMMARY

Hala Constructions Pty Ltd proposes to operate a landscaping supply and resource recovery facility at 99 Sargents Road, Ebenezer, NSW, 2756. The facility would receive construction and demolition (C&D) material and virgin excavated natural materials (VENM) sourced from sites Hala Constructions Pty Ltd operate and also VENM from other sites, requiring VENM removal.

C&D material accepted on the site would be limited to excavated natural materials (ENM), concrete and bricks, and greenwaste. The total amount of VENM and C&D to be processed is estimated not to exceed 20,000 tonnes annually.

The development area would be limited to a 2 hectare area of the 15 hectare site and is situated on vacant land. The construction of the facility involves erecting a new building to enclose the processing operations. This would house the crushing and screening equipment and material storage bays. Additionally, the following components would be constructed: a site office, weighbridge, washbay, car park, external storage bays and rain water tanks. No demolition works would be needed. The site would require cut and fill works to establish a working platform that would be capped with compacted roadbase material.

The operation of the facility involves the following activities to be undertaken on site:

- Unloading and loading of materials;
- Material handling and sorting;
- Crushing and screening of concrete, bricks, and other waste materials; and
- Material storage.

Benbow Environmental was commissioned by Hala Constructions Pty Ltd to prepare an EIS to support the development applications. This EIS addresses the requirements of the Department of Planning and Environment, Hawkesbury City Council, the NSW Environment Protection Authority, Department of Primary Industries and the Roads and Maritime Services. The environmental and planning issues that were raised in these requirements and in the consultation undertaken for the project that warrant detailed assessment include strategic context, noise and vibration, air quality, soil and water, flora and fauna, waste management, hazards and risk, traffic and transport, visual amenity. Other minor issues that have been addressed include chemical management, heritage and human health.

A summary of the detailed assessments is included below:

STRATEGIC CONTEXT

The project has been driven by the increase in local demand for processing construction and demolition waste in the region. The family business already undertakes demolition activities and recycles the waste to third parties. It makes good business sense to extend the current family business to include a resource recovery and landscaping supplies component to fulfil their business need to recycle VENM and C&D waste materials.

The justifications for implementing the proposed development include:



- Reduce the quantity of construction and demolition wastes in landfill;
- Generation of local employment;
- The proposal supports ecologically sustainable development;
- The proposal presents no significant threats to the environment; and
- Extensive environmental safeguards have been designed into the development to minimise potential environmental impacts.

The land zoning for the subject land is described as RU1 – Primary Production under the provisions of the *Hawkesbury Local Environmental Plan 2012*, which applies to the subject site. The proposed development is for a landscaping material supply business and a resource recovery facility. Landscaping material supplies are permissible with consent within the RU1 Primary Production Zone. However, resource recovery facilities are not a permitted use with consent within the RU1 Zone, under the Hawkesbury LEP 2012. The Resource recovery component of the business is permitted with consent under Clause 121 of Division 23, Part 3, of the *State Environmental Planning Policy (Infrastructure) 2007* (iSEPP).

The proposal constitutes designated development under Schedule 3, Part 1 of the *Environmental Planning and Assessment Regulation 2000*, as it is captured by Clause 32(1)(d)(i), (ii) and (vi) being a waste management facility that is located within 100 metres of a natural waterbody, in an area of acid sulfate soils and within 500 metres of a dwelling not associated with the development.

The proposal constitutes integrated development as it includes a number of scheduled activities as defined by clauses 34, 41 and 42 under the *Protection of the Environment Operations Act 1997* as it involves processing more than 6,000 tonnes of waste per year and, therefore, it constitutes integrated development and requires an Environment Protection Licence (EPL).

A planning assessment undertaken in Section 3 demonstrates that the proposal is consistent with all relevant planning strategies, environmental planning instruments and development control plans.

SITE SUITABILITY

This site was selected as it was well located to serve the need to recover useful materials. The proposed use is permissible under the iSEPP and the proposal complies with all requirements under this planning policy. This SEPP prevails over the LEP. The land is suited to this type of activity as it has the following appropriate features:

- Adequate area available to house the proposed operations;
- Use of an area of the site that is already cleared of the majority of vegetation, minimising the number of trees to be removed;
- The site is not in an environmental constraints area;
- Well located to generate local employment; and
- Sufficiently screened from residences that amenity criteria can be satisfied by designing adequate controls which would not affect the viability of the business.

WASTE MANAGEMENT

The purpose of the proposal is to reduce the quantity of wastes going to landfill and recover materials so these can be resources for reuse. Incoming and processed materials would either be



stored in bays within the building or within external storage bays with walls up to 4 metres in height.

Waste generated as part of ongoing operations would be minimal. The waste types generated would include General solid waste (non-putrescible) and small quantities of General Solid Waste (putrescible) from the office and amenities. These wastes would be managed on site by storing these within designated waste bins or storage bays and removal by a licensed waste contractor.

Wastewater would not be generated and a trade waste agreement is not required. A septic system would be installed for treatment of sewage from the office.

The potential for other waste types like hazardous waste entering the subject site (e.g.: asbestos) within the waste loads would be managed by implementing an Incoming Waste Procedure.

HAZARDS AND RISK

The main hazards and risks associated with the proposal include:

- Storage and use of a hazardous chemical i.e. - diesel fuel;
- Fire risk including bushfire;
- Spillage incidents; and
- Release of sediments.

A preliminary risk screening of the proposed development in accordance with State Environment Planning Policy No. 33 has been undertaken and a preliminary hazard analysis (PHA) is not required due to the fact that the quantity of dangerous goods required to be stored on site does not exceed SEPP 33 thresholds.

A bushfire assessment was undertaken in accordance with requirements in *Planning for Bush Fire Protection 2006*. All plans have been reviewed and certified by the Bushfire Consultant in the Bushfire Compliance of Plans Certificate. The development would satisfy the aims and objectives of Planning for Bush Fire Protection 2006 if the following recommendations are implemented (summary only):

1. The lot should be managed as inner protection area (IPA) asset protection zone from the warehouse.
2. A static water supply of 20,000 Litres is to be provided for fire fighting purposes;
3. Where practical, electrical transmission lines are underground. If applicable reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 – The storage and handling of LP Gas.
4. Wherever possible, the storage of hazardous materials will be away from the hazard.
5. Implementation of an emergency evacuation plan by completing a Bush Fire Safety Plan on the NSW RFS website.

AIR QUALITY

An Air Quality Impact Assessment has been undertaken for the proposed development. A brief summary of the findings is presented below.

Dust control measures that would be implemented at the site include:



- Crushing and screening occurs within an enclosed building;
- Stockpiles are stored in walled bays and use water sprayers; and
- Truck wash facilities are present on site.

TSP and PM₁₀ emissions at all sensitive receptors were predicted to comply with the *Approved Methods* criterion for an annual averaging period. Emissions of PM_{2.5} do not comply with the annual criterion of 8 µg/m³. This is attributed to the annual background levels that already exceed. The maximum predicted increment is 0.01 µg/m³, this impact is considered to be negligible.

The maximum predicted impacts for the 24 hour averaging period of PM₁₀ exceed the criterion of 50 µg/m³ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolara Road, Ebenezer) with impacts of 50.29 µg/m³, 50.45 µg/m³, 50.2 µg/m³ respectively. This is attributed to elevated daily background concentrations.

Contemporaneous addition of the predicted daily increments of PM₁₀ with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM₁₀ would result due to the proposed site activities.

Dust control measures proposed for the site activities and are considered effective. No further controls are recommended.

NOISE AND VIBRATION

A Noise Impact Assessment has been undertaken for the proposed development and addressed construction, operational and road traffic noise. A brief summary of the findings is presented below.

Noise propagation modelling was carried out using Sound PLAN v7.3. One scenario modelling the worst case operations was undertaken. This was re-modelled with the eastern most roller door closed. Modelling results found that during operations, noise levels are predicted to comply with the Noise Policy for Industry criteria at all receivers with the following noise control measures in place:

- Site activities are limited to the day period (7:00am to 6:00pm).
- The crushing and screening activities are confined within the enclosed building.
- The eastern most roller shutter door (Door 4) is closed when the crusher is in operation.
- The building roof and walls are to be constructed of 0.5 mm Colorbond sheet steel ($R_w = 22$ dB). The floor is to be constructed of concrete.
- Equipment including the excavator and front end loader are to be fitted with reversing lights or a white noise reversing alarm.

Construction noise was modelled using the ISO 9613 algorithm within SoundPLAN for three stages including civil works, concreting construction works and structure construction works. The construction stages were modelled using the $L_{Aeq, 15 \text{ minutes}}$ descriptor.

Compliance is predicted with the day noise criteria at all receptors and stages of construction. Construction activities are therefore proposed to take place during standard **construction** hours only.



Calculation of road traffic noise contribution was undertaken using SoundPLAN assuming a maximum of 2 truck movements per hour between 7am and 5pm as a conservative scenario. No truck movements are proposed during the night period. Vehicles are assumed to travel along Sargents Road at 60 km/h. Predicted road traffic noise levels were predicted to comply with criteria and no additional mitigation measures are required.

SOIL AND WATER

Water is not required for the proposed processing operations. Water is needed for use in the vehicle wash bay, for dust suppression purposes and in the office. Water would be supplied by 2 x 22,000 Litre on-site rain water tanks. Any additional water required would be purchased.

Stormwater from roofed areas would be directed into the rainwater tanks for use on site. Stormwater from external areas would be managed with a drainage system, silt arrestor and absorption pit. Stormwater drainage for the development area has been designed by Australian Consulting Engineers.

The proposed building works and site development would involve earthworks which would result in disturbance to soil during construction. There is a low probability that acid sulfate soils exist at the site. A Phase I Environmental Site Assessment concluded that the likelihood of contamination existing at the site is low.

During site operations, processing activities would take place within the purpose built building and the external area would be capped with compacted roadbase. There would be diesel storage in a self bunded tank and use of a bunded closed loop heavy vehicle wash bay. Materials stored in external storage bays are inert. The risk of contamination to soil and land is mainly related to contaminated stormwater seeping into the ground. However there would be an absence of chemicals in the waste brought to site as all wastes are inert and solid.

FIRE AND INCIDENT MANAGEMENT

The facility will require fire fighting equipment to be installed including fire hydrants, hose reels and extinguishers. A fire risk assessment found that with mitigation measures in place, the fire risk is low.

An Emergency and Pollution Incident Response Management Plan would be implemented.

TRAFFIC AND TRANSPORT

A traffic and parking assessment was undertaken by ML Traffic Engineers.

Material would be transported in trucks ranging from 23 to 48 tonnes in size. On average, the proposed development is expected to generate 4-5 truck trips per day, which equates to less than 1 truck movement every 2 hours.

27 car parking spaces are proposed to be provided on site. This complies with the Hawkesbury Development Control Plan 2002.



The Traffic and Parking Impact Assessment undertaken by ML Traffic Engineers included a proposed intersection assessment. External traffic travelling to and from the site will most likely travel through the following three intersections:

- Stannix Park Road and Sargents Road;
- Sackville Road and Stannix Park Road; and
- Sackville Road with Ebenezer Wharf Road and Lockhart Road.

Additional trips associated with the proposed development were included in the proposed intersection assessment using the SIDRA model and results for all 3 intersections were as follows:

- All turn movements have LoS A for both AM and PM peak hours; and
- The additional trips do not change the LoS of any turn movements or the overall intersection.

The assessment made the following conclusions:

- The proposed development is a modest trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed development can be accommodated at the nearby intersections and road network without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning consent for the proposed development should be refused.

Swept path diagrams have been provided for the development area and the intersection between Stannix Park Road and Sackville Road. The diagrams indicate that the intersection between Stannix Park Road and Sackville Road requires an upgrade.

There are concerns regarding the ability of Sargents Road to cope with the traffic associated with the proposed development. Recommended mitigation measures have been included in the EIS, however, it is ultimately Council's decision in regard to whether the road needs to be sealed.

BIODIVERSITY

The land is not biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*.

The subject site is not identified as containing a critical habitat or biodiversity, but does contain an area of connectivity between significant vegetation according to the Terrestrial biodiversity map in the Hawkesbury LEP 2012. The proposed development is located in a 2 hectare area on site that has already been disturbed and is largely cleared of vegetation. Some tree removal would be required and is shown on the landscape plan. An Arboricultural Implication Assessment and Tree Management Plan was undertaken by a qualified arborist to manage the existing trees during the planning and construction of the proposed development.

Following further consultation with Hawkesbury City Council, it was advised that the site contains endangered ecological communities as shown in Clause 6.4 of LEP 2012, reference number BIO_008C. Therefore, a flora and fauna assessment is required to assess the significance of trees proposed for removal. Furthermore, from November 2019 developments within the Hawkesbury City Council LGA that involve clearing of native vegetation in excess of 0.25 hectares must be



assessed using the Biodiversity Assessment Method (BAM) therefore a Biodiversity Development Assessment Report (BDAR) was undertaken. The BDAR found:

- The proposed development has been purposefully designed to minimise impacts on biodiversity values, as it has been positioned within historically cleared land that contains scattered canopy trees. The Subject Land is currently used for grazing and contains low biodiversity values.
- A total of Six (6) ecosystem credits for PCT 1081 are required to offset in order to mitigate the impacts upon biodiversity as a result of the proposed development. No candidate species credit species will require offsetting.
- A pre-clearing survey and supervision of clearing of all vegetation is required to be undertaken by a Project Ecologist as part of the Construction Environmental Management Plan (CEMP) for the site.

VISUAL

The site is located within a rural area and is well screened from view at nearest sensitive receptors. A landscaping plan has been provided.

HERITAGE

The subject land was found not to be affected by an Interim Heritage Order under the provisions of the NSW *Heritage Act 1977*. No Aboriginal Places or European heritage locations have been identified or uncovered on the subject site or in its vicinity.

The site is also not listed as being a heritage item or containing items under the Hawkesbury LEP 2012.

CONSULTATION

Consultation has been undertaken with the local Council, the NSW EPA and the local residents in the surrounding area. A community information sheet was hand delivered to residents or left in their letterboxes if the property entrance was locked or it was likely no-one was home.

CONCLUSIONS

The environmental assessment process has enabled the potential impacts of the proposed development to be evaluated, and control strategies to be devised in order to ensure compliance with regulatory standards.

To ensure the potential impacts of the proposed development are well managed, an Environmental Management Plan (EMP), and Emergency and Pollution Incident Response Management Plan would be implemented.



A Statement of Commitments is provided as Section 13. The Statement of Commitments summarises the commitment made by Hala Constructions to implement the environmental controls designed into the development. The size and nature of the proposed development is considered to be suited to this site and the request is made that approval be granted.

Contents

Page

EXECUTIVE SUMMARY	I
1. INTRODUCTION	1-1
1.1 Proposal Overview	1-1
1.1.1 Objectives of the Proposal	1-1
1.1.2 Staging of the Proposal	1-2
1.2 The Proponent	1-2
1.2.1 Industry Background	1-2
1.2.2 Relationship with other Industries or Facilities	1-2
1.3 Need for Development	1-2
1.4 Development Alternatives	1-3
1.4.1 Alternative Locations	1-3
1.4.2 Alternative Design and Processes	1-3
1.4.3 Site Selection	1-5
1.4.4 “No project” Option	1-5
1.5 EIS Function and Structure	1-5
1.5.1 EIS Function	1-5
1.5.2 EIS Structure	1-5
2. LOCATION AND SETTINGS	2-1
2.1 Site location and boundaries	2-1
2.2 Site Layout and plans	2-3
2.3 Existing Facilities	2-6
2.4 Land Use	2-6
2.5 Local Community	2-8
2.5.1 Ebenezer and the Surrounding Area	2-8
2.5.2 Population Demographics	2-8
2.6 Nearest Sensitive Receivers	2-8
2.7 Site History	2-10
2.7.1 DA History	2-10
3. PLANNING FRAMEWORK	3-1
3.1 Commonwealth Controls	3-1
3.2 State Controls	3-1
3.2.1 Environmental Planning and Assessment Act and Regulation	3-1
3.2.1.1 Designated development	3-1
3.2.1.2 Integrated development	3-3
3.2.1.3 Section 4.15 (1) – Matters for Consideration	3-5
3.2.2 Biodiversity Conservation Act 2016	3-8
3.2.3 NSW Heritage Act 1977	3-8
3.2.4 State and Regional Environmental Planning Policies	3-8
3.2.4.1 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development	3-9
3.2.4.2 State Environmental Planning Policy No. 55 – Remediation of Land	3-9
3.2.4.3 State Environmental Planning Policy (Infrastructure) 2007	3-10

3.2.4.4	State Environmental Planning Policy (State Significant Precincts) 2005	3-10
3.2.4.5	State Environmental Planning Policy (State and Regional Development) 2011	3-11
3.2.4.6	Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No 2—1997)	3-11
3.2.4.7	State Environmental Planning Policy No. 64 – Advertising and Signage	3-13
3.2.4.8	State Environmental Planning Policy (Coastal Management) 2018	3-13
3.3	Local Controls	3-14
3.3.1	Local Environmental Plan	3-14
3.3.1.1	Zone Objectives	3-15
3.3.1.2	Permissibility	3-17
3.3.1.3	General LEP Requirements	3-18
3.3.2	Development Control Plans	3-22
4.	CONSULTATION	4-1
4.1	Stakeholder Engagement	4-1
4.2	Community Consultation	4-2
4.3	Assessment Requirements	4-3
5.	DESCRIPTION OF PROPOSED DEVELOPMENT	5-1
5.1	Proposed Site Activities and Site Use	5-1
5.2	Site Layout Plans	5-2
5.3	Construction Works	5-2
5.4	Production Process	5-3
5.5	Resources and Finished Goods	5-3
5.6	Equipment	5-4
5.7	Chemicals	5-4
5.8	Operational Details	5-4
5.8.1	Utility Connections	5-4
5.8.1.1	Water	5-4
5.8.1.2	Sewage and Wastewater	5-4
5.8.1.3	Electricity	5-4
5.8.1.4	Telecommunications	5-5
5.8.1.5	Gas, Petrol and Diesel	5-5
5.8.2	Hours of Operation	5-5
5.8.3	Employment	5-5
5.8.4	Traffic	5-5
5.8.5	Parking	5-5
5.8.6	Site Security	5-5
5.9	Emissions and Waste	5-5
5.9.1	Air and Odour	5-6
5.9.2	Noise and Vibration	5-6
5.9.3	Water and Wastewater	5-7
5.9.4	Waste	5-7
5.10	Cleaner Production Actions	5-7
5.10.1	Measures to minimise waste	5-7
5.10.2	Proposals for use or recycling of by-products	5-8
5.10.3	Proposed disposal methods for solid and liquid waste	5-8
5.10.4	Air management systems	5-8
5.10.5	Water Management System	5-8

5.10.6	Soil contamination prevention	5-8
5.11	Site Rehabilitation	5-8
5.11.1	Rehabilitation Objectives	5-8
5.11.2	Rehabilitation Strategies	5-9
5.11.3	Final Land Use and Landform	5-9
6.	EXISTING ENVIRONMENT	6-1
6.1	Geology and Soils	6-1
6.1.1	Geological and Soil Landscapes	6-1
6.1.2	Acid Sulfate Soils	6-1
6.2	Topography	6-3
6.3	Hydrology	6-5
6.3.1	Waterways and Catchment	6-5
6.3.1.1	Water Quality and River Flow Objectives	6-7
6.3.1.2	Catchment Management Plan	6-7
6.3.2	Groundwater	6-11
6.3.3	Flooding	6-11
6.4	Flora and Fauna	6-12
6.4.1	Significant Vegetation	6-15
6.5	Noise Amenity	6-16
6.5.1	Nearest Receptors	6-16
6.5.2	Existing Acoustic Environment	6-19
6.5.2.1	Measured Noise Levels	6-19
6.5.2.1.1	Short Term Operator Attended Noise Monitoring Results	6-19
6.5.2.1.2	Long-Term Unattended Noise Monitoring Results	6-19
6.5.3	Meteorological Conditions	6-20
6.6	Background Air Quality	6-20
6.7	Climate	6-21
6.7.1	Temperature	6-21
6.7.2	Rainfall	6-21
6.7.3	Wind	6-22
7.	IDENTIFICATION AND PRIORITISATION OF ISSUES	7-1
7.1	Summary of Potential Issues	7-1
8.	ENVIRONMENTAL IMPACTS AND SAFEGUARDS	8-1
8.1	Air Quality	8-1
8.1.1	Dust Assessment Criteria	8-1
8.1.2	Dust Control Measures	8-1
8.1.3	Dispersion Model and Emission Data	8-1
8.1.4	Predicted Impacts	8-1
8.2	Noise	8-2
8.2.1	Operational Noise Impact Assessment	8-2
8.2.1.1	Project Noise Trigger Levels	8-2
8.2.1.2	Predicted Impacts	8-3
8.2.1.3	Noise Control Measures	8-3
8.2.2	Road Traffic Noise Impact Assessment	8-4
8.2.3	Construction Noise Impact Assessment	8-5
8.2.3.1	Construction Noise Impacts	8-5

	8.2.3.2	Construction Predicted Noise Levels	8-5
	8.2.4	Statement of Potential Noise Impacts	8-6
8.3	Water		8-7
	8.3.1	Water Interactions	8-7
	8.3.1.1	Supply & Use	8-7
	8.3.1.2	Wastewater	8-8
	8.3.1.3	Surface Water & Stormwater Runoff	8-8
	8.3.1.4	Leachate	8-9
	8.3.1.5	Groundwater	8-9
	8.3.2	Water Legislation	8-9
	8.3.2.1	Water Act, 1912	8-9
	8.3.2.2	Water Management Act, 2000	8-9
	8.3.2.3	Water Sharing Plans	8-9
	8.3.3	Flooding	8-10
	8.3.4	Stormwater Management System	8-10
	8.3.5	Wash Bay	8-10
	8.3.6	Dust Suppression	8-10
	8.3.7	Potential Pollutants	8-11
	8.3.8	Potential Water Impacts and Safeguards	8-11
	8.3.9	Erosion and Sediment Control	8-12
8.4	Soil		8-12
	8.4.1	Soil Characteristics of the Site	8-13
	8.4.1.1	Acid Sulfate Soils	8-13
	8.4.1.2	Existing Contamination	8-13
	8.4.2	Potential Impacts to Soil and Land	8-13
	8.4.2.1	Construction Works	8-13
	8.4.2.2	Operational Works	8-13
	8.4.3	Agricultural Resources	8-14
	8.4.4	Land Use Conflicts	8-14
	8.4.4.1	Gathering of Information	8-15
	8.4.4.1.1	Site Characteristics	8-15
	8.4.4.1.2	Nature of Proposed Development	8-15
	8.4.4.1.3	Surrounding Land Uses	8-15
	8.4.4.2	Evaluation of Risk Level	8-16
	8.4.4.2.1	Risk Criteria	8-16
	8.4.4.2.2	Identification of potential land use conflicts	8-17
	8.4.4.3	Risk Reduction Management Strategies	8-18
	8.4.4.4	Results	8-18
8.5	Flora and Fauna		8-19
	8.5.1	Biodiversity Development Assessment Report (BDAR)	8-19
	8.5.2	Arboricultural Implication Assessment	8-20
	8.5.3	Biodiversity Value	8-1
	8.5.4	Tree Removal	8-1
	8.5.5	Landscaping	8-1
	8.5.6	Weed Management	8-1
8.6	Waste Generation and Management		8-2
	8.6.1	Relevant Legislation and Guidelines	8-2
	8.6.1.1	Waste Classification Guidelines	8-2
	8.6.1.2	Protection of the Environment Operations Act 1997	8-3

8.6.1.3	Protection of the Environment Operations (Waste) Regulation 2014	8-3
8.6.1.3.1	Waste Levy Guidelines 2015	8-5
8.6.1.4	Waste Avoidance and Resource Recovery Act 2001	8-6
8.6.2	Waste Generation and Management	8-6
8.6.2.1	Demolition Waste	8-6
8.6.2.2	Construction Waste	8-6
8.6.2.2.1	Unexpected Finds Protocol	8-7
8.6.2.3	Recovered Waste	8-7
8.6.2.4	On-going Waste	8-9
8.6.2.4.1	Incoming Waste Inspection	8-9
8.6.3	Waste Avoidance and Resource Recovery	8-10
8.6.4	Waste Storage	8-10
8.7	Hazards and Risks	8-10
8.7.1	Chemicals and Dangerous Goods Storage	8-10
8.7.2	Preliminary Risk Screening	8-11
8.7.3	Fire	8-13
8.7.3.1	Fire Protection	8-13
8.7.3.2	Fire Risk Assessment	8-14
8.7.3.2.1	Methodology	8-14
8.7.3.2.2	Hazard Identification	8-14
8.7.3.2.3	Risk Criteria	8-14
8.7.3.2.4	Consequence Estimation	8-14
8.7.3.2.5	Likelihood Estimation	8-15
8.7.3.2.6	Level of Risk	8-16
8.7.3.2.7	Risk Characterisation and Identification	8-16
8.7.3.2.7.1	Identification of Hazards	8-16
8.7.3.2.8	Risk Analysis	8-17
8.7.3.3	Assessment of Fire Threat	8-21
8.7.3.4	Bushfire Hazard	8-21
8.7.4	Incident Management	8-22
9.	SOCIAL IMPACTS AND SAFEGUARDS	9-1
9.1	Human Health	9-1
9.1.1	Generation of Dust	9-1
9.1.2	Asbestos Waste	9-1
9.1.3	Generation of Noise	9-2
9.1.4	Fire and Chemical Spill Risk	9-2
9.1.5	Employee Health and Safety	9-2
9.2	Visual Impacts	9-3
9.2.1	Building Height	9-3
9.3	Heritage	9-4
9.4	Road, Traffic and Transport	9-6
9.4.1	Traffic and Parking Impact Assessment	9-6
9.4.1.1	Existing Traffic Volume and Intersection Assessment	9-6
9.4.1.2	Traffic Generation	9-6
9.4.1.3	Proposed Intersection Assessment	9-7
9.4.1.4	Car Parking	9-8
9.4.1.5	Site Access	9-8
9.4.2	Sargents Road	9-8

9.4.2.1	Road Width	9-9
9.4.2.2	Unsealed Condition	9-9
9.4.2.3	Dust Generation	9-9
9.4.2.4	Recommended Mitigation Measures	9-10
9.4.3	Swept Paths	9-10
9.5	Biosecurity	9-11
9.5.1	Identification of Hazards	9-11
9.5.2	Discussion	9-11
9.5.2.1	Spread of Pests	9-11
9.5.2.2	Spread of Disease	9-11
9.5.2.3	Spread of Weed Seed	9-12
9.5.3	Recommended Safeguards	9-12
10.	CUMULATIVE IMPACTS AND SAFEGUARDS	10-1
10.1	Air Quality	10-1
10.2	Noise and Vibration	10-2
10.3	Surface Waters	10-2
10.4	Waste Management	10-2
10.5	Hazards and Risk	10-2
10.6	Traffic and Transport	10-3
11.	ECOLOGICALLY SUSTAINABLE DEVELOPMENT	11-1
12.	MITIGATION MEASURES AND MANAGEMENT	12-1
12.1	Summary of Controls and Mitigation Measures	12-1
12.2	Site Management Plans	12-3
12.2.1	Emergency and Pollution Incident Response Management Plan	12-3
12.2.2	Environmental Management Plan	12-4
13.	STATEMENT OF COMMITMENTS	13-1
14.	LIST OF APPROVALS AND LICENCES	14-1
15.	JUSTIFICATION AND CONCLUDING REMARKS	15-1
15.1	Project Justification	15-1
15.2	Concluding Remarks	15-2
16.	REFERENCES	16-1

Tables

Page

Table 2-1: Nearest Receivers	2-9
Table 2-2: Council's Development and Building Application and consent Records from 99 Sargents Road, Ebenezer	2-11
Table 3-1: Licence/Approval Requirements as Integrated Development	3-3
Table 3-2: Resource Recovery Scheduled Activity	3-5
Table 3-3: State and Regional Environmental Planning Policies	3-8
Table 3-4: Hawkesbury Local Environmental Plan 2012 Part 4 Principal Development Standards	3-18
Table 3-5: Hawkesbury Local Environmental Plan 2012 Part 5 Miscellaneous Provisions	3-19
Table 3-6: Hawkesbury Local Environmental Plan 2012 Part 6 Additional Local Provisions	3-20
Table 3-7: General Guidelines within Part C of the Hawkesbury Development Control Plan 2002	3-22
Table 3-8: Industrial Development within Part D of the Hawkesbury Development Control Plan 2002	3-23
Table 4-1: DP&E Assessment Requirements and EIS Reference	4-4
Table 4-2: Department of Primary Industries Assessment Requirements and EIS Reference	4-28
Table 4-3: NSW Rural Fire Service Assessment Requirements and EIS Reference	4-29
Table 4-4: Roads and Maritime Services Assessment Requirements and EIS Reference	4-30
Table 6-1: CAP Goals and Strategies	6-8
Table 6-2: Available Data for Groundwater Bores within 500 m of the subject site.	6-11
Table 6-3: List of threatened species in the selected area within the last 5 years	6-13
Table 6-4: Nearest Receivers	6-17
Table 6-5: Operator Attended Noise Measurements, dB(A)	6-19
Table 6-6: Unattended Noise Monitoring Results, dB(A)	6-20
Table 6-7: Meteorological Conditions Assessed in Noise Propagation Modelling	6-20
Table 6-8: Summary of 2015 Data for PM _{2.5} and PM ₁₀ from Richmond Air Quality Monitoring Station.	6-21
Table 6-9: Temperature Statistics at Richmond RAAF	6-21
Table 6-10: Rainfall Statistics – Richmond RAAF	6-22
Table 8-1: Project Noise Trigger Levels (PNTL) for Operational Activities, dB(A)	8-2
Table 8-2: Noise Modelling Results Associated with Operational Activities, L _{eq} , dB(A)	8-3
Table 8-3: Predicted Levels for Road Traffic Noise	8-4
Table 8-4: Modelled Noise Stages for Proposed Construction Works	8-5
Table 8-5: Noise Modelling Results Associated with Construction Activities for L _{eq} , dB(A)	8-6
Table 8-6: Potential pollutants and pathways	8-11
Table 8-7: Potential Risks to Receiving Waters and Mitigation Measures	8-12
Table 8-8: Potential Risks to Soil and Mitigation Measures	8-14
Table 8-9: Probability Table – to score the likelihood of the consequence occurring	8-16
Table 8-10: Measure of Consequence	8-16
Table 8-11: Risk Ranking Matrix	8-17
Table 8-12: Initial Risk Evaluation	8-17
Table 8-13: LUCRA Results	8-18
Table 8-14: Classes of Waste from Waste Classification Guidelines	8-2
Table 8-15: Construction Waste	8-6
Table 8-16: Incoming Waste Types, Quantities and Management	8-8
Table 8-17: Recovered Material Types, Quantities and Management	8-8
Table 8-18: Chemical Storage	8-10
Table 8-19: SEPP 33 Preliminary Risk Screening	8-11

Table 8-20: Consequence Table	8-15
Table 8-21: Likelihood Table	8-15
Table 8-22: Level of Risk Table	8-16
Table 8-23: Identification of Hazards	8-17
Table 8-24: Fire – Risk Register	8-18
Table 11-1: ESD Principles – Meaning and relevance to the Proposed Development	11-1
Table 11-2: Sustainability Indicators	11-3
Table 12-1: Summary of Potential Impacts, Environmental Safeguards and Control Measures	12-1
Table 14-1: Required licences, approvals and permits	14-1

Figures	Page
Figure 2-1: Site Location in a Regional Context	2-1
Figure 2-2: The Site Location in a Local Context	2-2
Figure 2-3: The Site's Current Layout	2-3
Figure 2-4: Aerial showing the proposed development area	2-4
Figure 2-5: Proposed Site Plan	2-5
Figure 2-6: Surrounding land use zoning	2-7
Figure 2-7: Nearest sensitive receivers	2-10
Figure 3-1: Coastal wetlands map showing proposed development area	3-14
Figure 4-1: Location of residences visited during consultation	4-3
Figure 6-1: Acid Sulfate Soil Map	6-2
Figure 6-2: Local Topography with Vertical Exaggeration of 10	6-4
Figure 6-3: Nearest Waterway	6-6
Figure 6-4: Wetlands Map	6-7
Figure 6-5: Probable Maximum Flood Hazard Extent	6-12
Figure 6-6: Nearby fauna sightings	6-15
Figure 6-7: Nearby Receptors	6-18
Figure 6-8: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF base, Bureau of Meteorology (2015)	6-23
Figure 8-1: Water Balance Diagram	8-8
Figure 8-2: Tree management plan	8-1
Figure 8-3: On-going Waste	8-9
Figure 9-1: Heritage Map	9-5

Appendices

EIS Appendix 1: Air Quality Impact Assessment
EIS Appendix 2: Noise Impact Assessment
EIS Appendix 3: Phase I Assessment
EIS Appendix 4: Preliminary Acid Sulfate Soil Assessment
EIS Appendix 5: Traffic and Parking Impact Assessment
EIS Appendix 6: Flood Impact Assessment
EIS Appendix 7: Bush Fire Assessment Report
EIS Appendix 8: Waste Management Plan
EIS Appendix 9: Site Plans
EIS Appendix 10: Arborist Implication Assessment
EIS Appendix 11: Biodiversity Development Assessment Report

Attachments

EIS Attachment 1: NSW DP&E SEARs
EIS Attachment 2: NSW RMS SEARs
EIS Attachment 3: Community Consultation Sheet
EIS Attachment 4: Coolfog System
EIS Attachment 5: EL Water Recycling Plant Specification Sheet
EIS Attachment 6: Sika Dust Seal
EIS Attachment 7: Pre-Lodgement Advice





1. INTRODUCTION

Benbow Environmental has been engaged by Hala Constructions Pty Ltd ('the proponent') for the preparation of an Environmental Impact Statement (EIS) for the proposed operation of a landscaping supply business, using virgin excavated natural materials (VENM) and a resource recovery business. The business would be located at 99 Sargents Road, Ebenezer, NSW, 2756.

This section of the EIS provides a general overview of the proposed development including objectives, industry background and the need for development, and provides a general overview of the function and structure of this report.

1.1 PROPOSAL OVERVIEW

The proposed development consists of the establishment of a landscaping supply business (using VENM) and a resource recovery facility.

The facility would receive construction and demolition (C&D) material and virgin excavated natural materials (VENM) sourced from sites Hala Constructions Pty Ltd operate and also VENM from other sites, requiring VENM removal. C&D material accepted on the site would be limited to excavated natural materials (ENM), concrete and bricks, and greenwaste. The total amount of VENM and C&D to be processed will not exceed 20,000 tonnes annually.

The construction of the facility involves cut and fill works and the erection of a new building to enclose the processing operations, a site office, weighbridge, washbay, car park, external storage bays and rain water tanks. No demolition works would be needed.

The operation of the facility involves the following activities to be undertaken on site:

- Unloading and loading of materials;
- Material handling and sorting;
- Crushing and screening of concrete, bricks, and other waste materials; and
- Material storage.

The EIS addresses the requirements of the Department of Planning and Environment, Hawkesbury City Council, the NSW Environment Protection Authority, the Department of Primary Industries and other relevant regulatory agencies.

1.1.1 Objectives of the Proposal

The main objective of the proposal is to create a new landscaping supply and resource recovery facility that dovetails with the on-going family-run business of construction and demolition, and earth moving. Secondary objectives include:

- Creating a facility to convert up to 20,000 tonnes per year of waste materials into useful products to use for landscaping other purposes;
- To divert specific construction and demolition waste from being sent to landfill; and
- To operate the facility to a high environmental standard and ensure cleaner production principles are implemented.



1.1.2 Staging of the Proposal

The proposal will be undertaken in one stage.

1.2 THE PROPONENT

Hala Constructions Pty Ltd is a family operated business, whom undertakes demolition and construction work, chiefly in the residential market.

They have a reputation for a high standard of workmanship. Their family business undertakes the demolition of existing residences and recycles or disposes of the removed materials. Presently these materials are either recycled at existing resource recovery facilities, operated by other parties or sent to landfill.

The ENM and VENM that is removed is also currently recycled through other parties or, where practicable, VENM may be used as fill once it has been classified in accordance with the Waste Classification Guidelines.

1.2.1 Industry Background

Hala Constructions Pty Ltd specialise in the following:

- Capping Beam;
- Underpinning;
- Piling and Shoring;
- Demolition;
- Haulage;
- Earthworks;
- Bulk & Detail Excavation;
- Anchors; and
- Shotcrete.

1.2.2 Relationship with other Industries or Facilities

The proponent has a strong professional relationship with industry members, construction companies and related subcontractors across Sydney. The proponent is committed to a “ZERO HARM” approach in their business. This approach employs safety and sustainability practices to create awareness and build strong relationships with their various stakeholders.

1.3 NEED FOR DEVELOPMENT

The family business already undertakes the demolition of existing residences and recycles the removed materials with existing resource recovery facilities operated by other parties. It makes good business sense for the family to extend their current business operation to include a resource recovery and landscaping supplies component to fulfil their business need to recycle VENM and C&D waste materials.



There exists within NSW, for natural resources where possible to be reclaimed. Currently most aggregate material is derived from quarries, which have their own significant environmental impacts. Natural resources are not infinite, currently there is a shortage of natural sand available for construction along the east coast with a push from industry to better utilise the fine-grained aggregate material generated during crushing (termed “manufactured sand”). This proposal allows Hala Constructions Pty Ltd to utilise a growing market need that supports sustainable use of waste materials.

1.4 DEVELOPMENT ALTERNATIVES

The proposed operations would redirect waste materials from entering landfill and would fulfil the proponent’s existing business needs. The site has ample room to comfortably house the project.

The site is surrounded by rural and other extractive industries typical of a rural environment.

With proper design and some site modifications it would fulfil the principles of ecologically sustainable development and the facility would be designed to operate without affecting the amenity of residents.

The nearest receptors to the site are rural-residential and rural businesses.

Other such businesses already exist within the area.

1.4.1 Alternative Locations

Alternative locations were not evaluated as they would require the proponent to purchase an additional property at another location, necessitating additional financial expense. This property will serve as the proponents’ future principal place of residence as well as a place of business. It makes efficient use of the land.

1.4.2 Alternative Design and Processes

The proposed development is considered to be the most cost-effective process with minimal environmental impact after consideration was given to the following factors:

Site Layout, Access Modes and Routes

The development area of the site was selected as it is an already disturbed area of land that would require the least number of trees to be removed. The area chosen would not disturb area of connectivity between significant vegetation that occupies the southernmost quarter of the site and can utilise the natural fall of the land for drainage purposes. The existing tenants would also be able to continue activities with the commencement of the proposed development.

Vehicles can access the development area directly from Sargents Road which provides direct access to both the weighbridge, car parking area and office. This access configuration isolates the industrial operation from the existing rural activities avoiding unnecessary conflict with vehicles. Alternative designs could be cars and trucks access from the existing site access driveway of the site; however this could cause conflict between cars and trucks from the rural activities.



The storage bays being located to the south of the proposed building provides additional separation between material storage and existing rural activities also providing a visual barrier. This also allows ample room between the building and storage bays for trucks to manoeuvre. The building has been designed with roller doors located on the southern side to minimise noise impacts and allow easy access to trucks. Any alternatives may result in the proposed activities being visible to tenants and elevated noise levels as well as a potentially longer pathway for trucks to travel to enter the building.

Materials Handling and Production Processes

The material handling and production process of receiving, sorting, crushing is standard for a C&D resource recovery facility and considering alternatives for this process is not warranted. The processing would be undertaken within the building and this would significantly reduce dust and noise impacts.

Waste and Water Management

The proposal is designed to minimise waste and recover the maximum amount of waste practicable from the C&D materials received. Waste management is assessed in Section 8.6. No alternatives to the waste management process are considered warranted. The development has also been designed so that no wastewater is generated.

Alternatives for water supply were considered and use of water captured in rainwater tanks from the proposed building roof was determined to be the most efficient option. As water is not required in the primary processes, water use is limited to wash down of trucks in the wash bay, dust suppression and office use. A water supply is also required for firefighting purposes should the need arise. Water sourced from the mains is impractical and expensive as the site is not currently connected to mains supply.

The development area utilises the natural fall of the site for surface water management/drainage; any alternatives would require unnecessary earthwork; a detailed assessment of alternative water management designs is not considered warranted.

Impact Mitigation Measures

The development area is designed to use the natural fall of the site for drainage purposes, and the processing would be undertaken within the building minimising environmental impacts for dust, noise, soil and water. There are no practical alternatives to the proposed design that would significantly improve the environmental impacts.

Energy Source

The site is connected to the electricity network. No alternatives are considered warranted. However, it is proposed that a backup diesel powered electrical generator be purchased and stored on site just in case it is required in an emergency. A self-bunded diesel tank is proposed for the site and this would fuel the back-up generator.



1.4.3 Site Selection

The site is well located to serve the community's needs in recovering useful materials. Industries promoting resource recovery and the diversion of waste from landfill should be supported.

This site has been selected for several reasons:

- The site has ample room available to house the proposed operations and can be confined to an area of the site that has already been disturbed, thereby minimising vegetation removal.
- The site is not in an environmental constraints area.
- The development is a permitted use with consent under the Infrastructure SEPP.
- The development will generate additional local employment.
- The development would introduce minimal waste processing and these processes would be able to operate on this site without affecting the amenity of residents.

1.4.4 "No project" Option

The "no" option would unnecessarily stymie the growth of the family business.

1.5 EIS FUNCTION AND STRUCTURE

1.5.1 EIS Function

The EIS report has two main functions. Firstly, the EIS is required to document the existing built and natural environment and assess all potential impacts that the proposal may have on various environmental and social aspects. Based on the impacts' assessment, the EIS discusses the management and control measures required by the proposed development to mitigate negative impacts and to achieve compliance with any criteria that applies to the proposal or site.

Secondly, the other function of the EIS is to provide all necessary information needed by the consent authority, the community, the various government authorities and the applicant to make informed decisions in relation to the proposed development, including its approval.

1.5.2 EIS Structure

The EIS is organised into the following three main sections:

- **Executive Summary**
This summarises the proposed development, justification and the environmental assessment of the proposal.
- **Main Contents of the EIS**
The main contents of the EIS describe the proposed development in detail, including the location and settings, the planning framework, the process description and other operational details. Then, the existing environment and the identification of issues are presented, followed by all necessary assessments of the potential environmental and, to a minor extent, social impacts. For each issue, safeguards and mitigation measures are addressed. The need and justification for the project are also included, together with a statement of commitments prepared for the proponent.



- **Appendices and Attachments**

The Appendices contain the site plans and technical support documents, the Attachments include the requirements of the Secretary's Environmental Assessment Requirements (SEARs) and community consultation leaflet.



2. LOCATION AND SETTINGS

This section describes the existing site and the location for the development. The surroundings are characterised and a general description of the environment that is likely to be affected is provided.

2.1 SITE LOCATION AND BOUNDARIES

The proposed facility is to be located within a 2 hectare area of the 15 hectare land holding at 99 Sargents Road, Ebenezer ("the subject site"), Lot 288, in DP 751665. Figure 2-1 shows the site location in a regional context, with the site's local context shown in Figure 2-2.

Figure 2-1: Site Location in a Regional Context





Figure 2-2: The Site Location in a Local Context

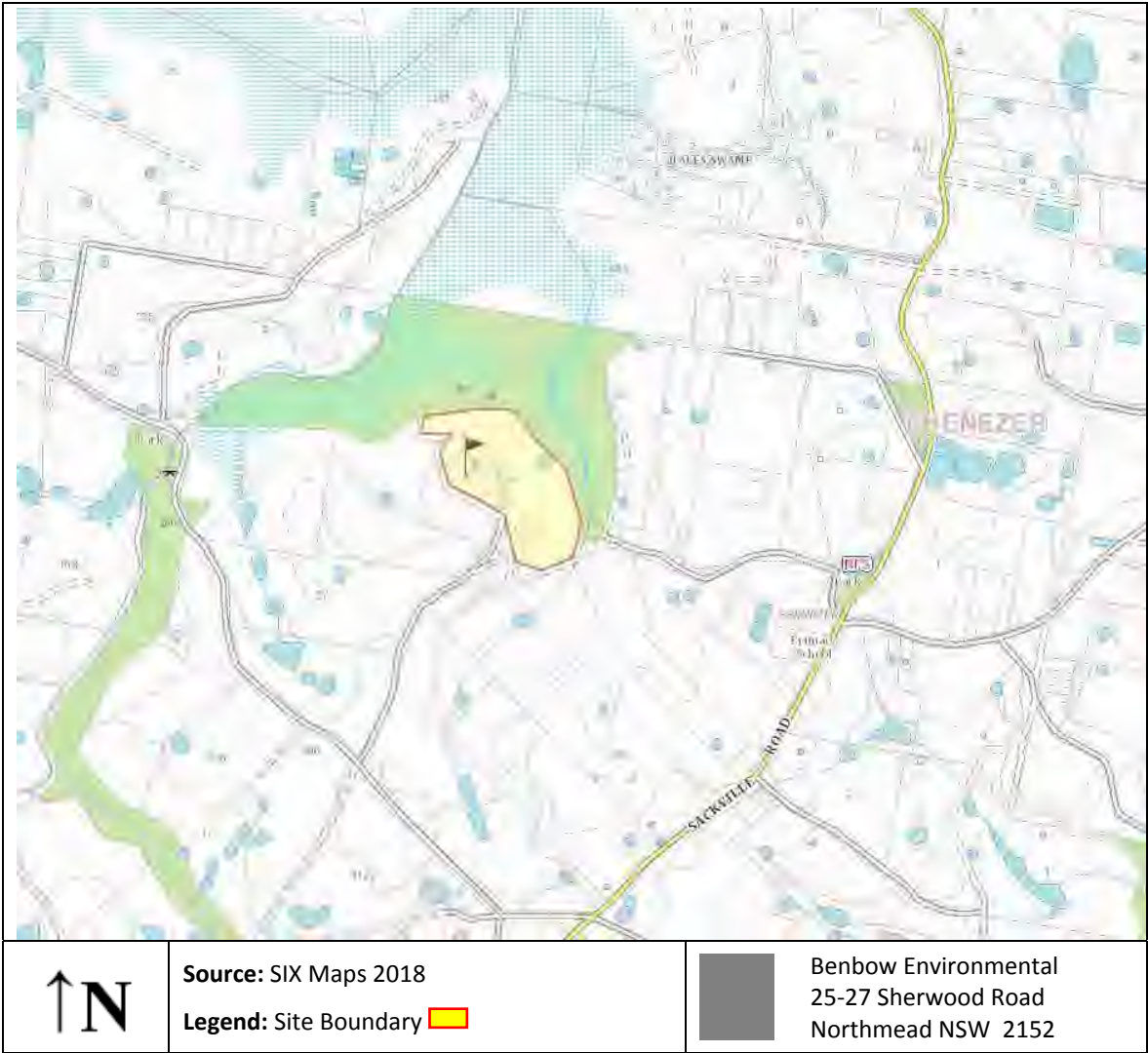




Figure 2-3: The Site’s Current Layout



2.2 SITE LAYOUT AND PLANS

Figure 2-3 is an aerial photograph and shows the site’s current layout. Figure 2-4 depicts the proposed development area. Figure 2-5 shows the proposed site plan of the development.



Figure 2-4: Aerial showing the proposed development area



1 SITE
1:300

FOR DA APPROVAL

PROPOSED RESOURCE MANAGEMENT FACILITY
99 SARGENTS ROAD, EBENEZER NSW 2756

19083

01 06/07/17 **B**
1:300 FM CB



2.3 EXISTING FACILITIES

The site is currently operating as an equestrian centre. Entrance and exit to the site is via Sargents Road. A small dam is located on the north-east of the site. There are two metal sheds currently located on the site, one located slightly west of the centre of the site and a smaller one in between the larger shed and the dam. The site is made up of numerous paddocks with groups of trees scattered throughout.

2.4 LAND USE

The land is zoned as *RU1 Primary Production land* under the Hawkesbury Local Environmental Plan 2012, as shown in Figure 2-6. The immediate surroundings are Primary Production and Rural Landscape, with some Public and Private Recreation, General Industrial, Recreational Waterways, Special Activities, Village and National Parks and Nature Reserves.

The land surrounding the site is densely vegetated to the immediate north, east and south. Land to the immediate west is occupied by a Labrador breeder and contains mainly areas of vegetation with some cleared areas of land and several sheds, structures and car parking. Surrounding land contains a mixture of rural land uses including composting and landscape supply activities, agricultural activities and poultry sheds. The surrounding land use is described as follows:

North: 96 Kolora Road, Ebenezer. Large rural parcel of land zoned RU1 extends to the north and east of the site and contains some cleared areas, significant vegetation and wetlands.

South: 477 Sackville Road, Ebenezer. This is RU1 zoned land containing an item of local heritage 'Kinlew', a late nineteenth century rural cottage facing Sackville Road. The area adjacent to the site contains dense vegetation.

East: 96 Kolora Road, Ebenezer. Large rural parcel of land zoned RU1 extends to the north and east of the site and contains some cleared areas, significant vegetation and wetlands.

West: Arrosers Labrador Breeders

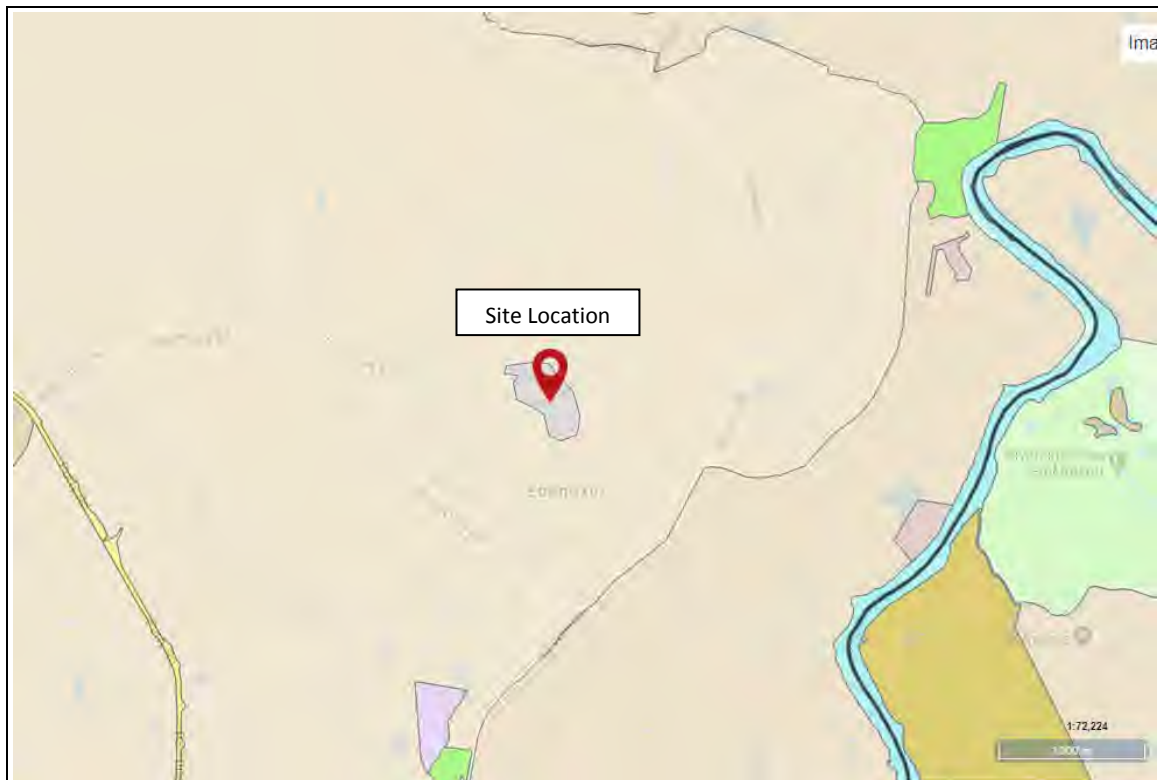
Sackville Road is located approximately 1 km south east of the site.

The closest residential zoned area is the small town of Wilberforce which is located well over 1 km to the South West of the site.

Ebenezer Primary School is located 700 m to the south east of the site along Sackville Road.

The Hawkesbury River is located approximately 2.3 km to the south east and meanders around to the east to also be 2.4 km to the north of the site. Cattai National Park is located to the south east of the site and the Hawkesbury River.

Figure 2-6: Surrounding land use zoning



Source: <https://www.planningportal.nsw.gov.au>

Legend:

B1 - Neighbourhood Centre	RE1 - Rural Production
B2 - Local Centre	RE2 - Rural Recreation
B3 - Commercial Core	RE3 - Primary Production
B4 - Mixed Use	RE4 - Rural Landscape
B5 - Business Development	RE5 - Farmstay
B6 - Enterprise Centre	RE6 - Primary Production Small Lot
B7 - Business Hub	RE7 - Village
B8 - Metropolitan Centre	RE8 - Recreation
E1 - National Parks and Nature Reserves	SP1 - Special Uses
E2 - Environmental Conservation	TF1 - Infrastructure
E3 - Environmental Management	TF2 - Tourism
E4 - Environmental Corridor	W1 - Waterways
IN1 - General Industrial	W2 - Recreational Waterways
IN2 - Light Industrial	W3 - Working Waterways
IN3 - Heavy Industrial	
IN4 - Working Waterways	
R1 - General Residential	
R2 - Low Density Residential	
R3 - Medium Density Residential	
R4 - High Density Residential	
R5 - Large Lot Residential	



2.5 LOCAL COMMUNITY

2.5.1 Ebenezer and the Surrounding Area

The suburb of Ebenezer is located approximately 69 km north-west of the Sydney Central Business District. Surrounding suburbs include Cattai (south-east), South Maroota (east), Sackville (north), East Kurrajong and Glossodia (west) and Wilberforce and Pitt Town (south). Land surrounding the site is mainly primary production, with Rural Landscape to the east and some Public and Private Recreation, as well as Recreational Waterways, Special Activities, Village and National Parks and Nature Reserves. Cattai National Park is located approximately 3 km south-east of the site.

2.5.2 Population Demographics

The Australian Bureau of Statistics (ABS) conducts a national census every 4 years. Data presented below has been sourced from the last census survey conducted in 2016.

At the time of the 2016 census, the population within the suburb of Ebenezer consisted of 993 people, of which 51 % were males and 49 % female. Of the total persons residing in Ebenezer, 536 people reported as being employed, of which approximately 61 % worked full-time and 29 % part-time. The largest occupation representation is technicians and trades 21.2 %, followed by managers 15.9 %, clerical and administrative 13.9 %, professionals 12 %, labourers 11.6 %, community and personal services 9 %, sales 7.9 % and machinery operators and drivers 7.5 % (ABS 2016).

2.6 NEAREST SENSITIVE RECEIVERS

The closest residential receivers are shown in Table 2-1 and Figure 2-7.

The nearest residences are located adjacent to the south-west of the site at 79 Sargents Road, 350 m to the south-east and 390 m to the north-east and the south-west of the site.

Adjacent to the site is Arroser Labrador Breeders and the nearest industrial receiver is located 555 m south-west.

The nearest waterway is Currency Creek, approximately 550 m north-west of the subject site. This creek is fed by the Hawkesbury River which is located 2630 m north of the site and follows round to 3140 m east, before heading south.

The nearest ecological receivers are within Cattai National Park, 3 km south-east. The park's wetland areas attract vulnerable black bitterns, powerful owls and rufous night herons, making it an important habitat for local populations of threatened species.

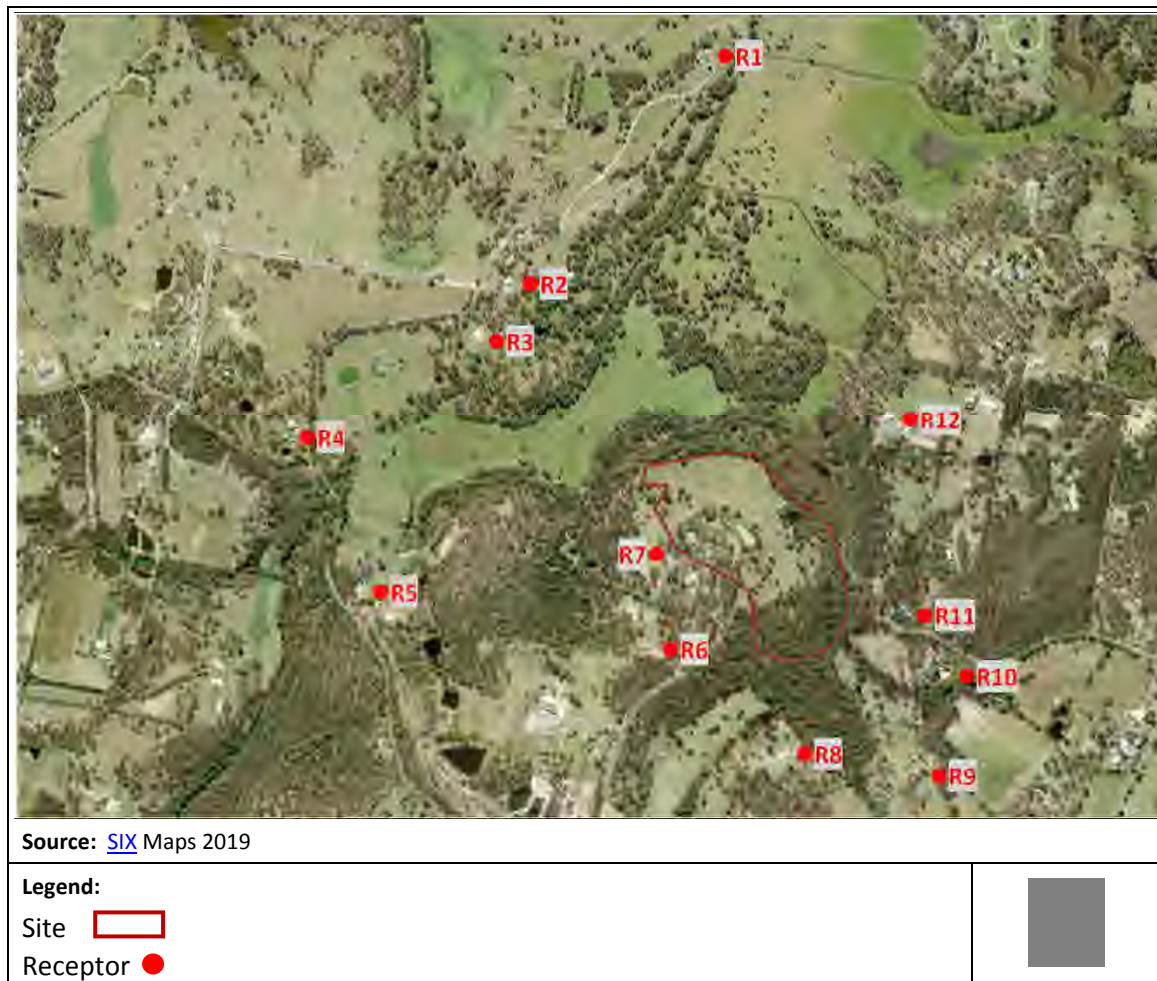


Table 2-1: Nearest Receivers

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Type of Receptor
R1	103 Stannix Park Lane, Wilberforce	Lot 111 DP 1171265	1230 m N	Residential
R2	82 Stannix Park Lane, Wilberforce	Lot 112 DP 1171265	930 m NW	Residential
R3	60 Stannix Park Lane, Wilberforce	Lot 2153 DP 1073493	890 m NW	Residential
R4	235 Stannix Park Road, Wilberforce	Lot 2 DP 48682	1240 m W	Residential
R5	283 Stannix Park Road, Wilberforce	Lot 1 DP 847274	1040 m W	Residential
R6	71 Sargents Road, Ebenezer	Lot 91 DP 1049276	390 m SW	Residential
R7	79 Sargents Road, Ebenezer	Lot 92 DP 1049276	Adjacent SW	Residential
R8	56 Sargents Road, Ebenezer	Lot 100 DP 1044703	520 m S	Residential
R9	89 Kolora Road, Ebenezer	Lot 4 DP 253783	650 m SE	Residential
R10	65 Kolora Road, Ebenezer	Lot 3 DP 253783	480 m SE	Residential
R11	88 Kolora Road, Ebenezer	Lot 2 DP 557365	350 m SE	Residential
R12	96 Kolora Road, Ebenezer	Lot 1 DP 557365	390 m NE	Residential



Figure 2-7: Nearest sensitive receivers



2.7 SITE HISTORY

Historical aerial photographs show that there have been no major changes to the site since 1955. Historical aerials are presented in the Phase I contamination assessment provided in Appendix 3. The main open areas have remained the same with the surrounding vegetation becoming increasingly sparse over time. The two buildings present in 1955 increase to three in 1965 with numerous sheds appearing in 1986 and five buildings appear by 1994. The part of the Hawkesbury River that surrounds the site is present in 1986, but by 1994 it has dried up and been diverted into a channel.

2.7.1 DA History

A summary of Council's Development and Building Application and consent Records from 99 Sargents Road, Ebenezer is provided in Table 2-2.



Table 2-2: Council's Development and Building Application and consent Records from 99 Sargents Road, Ebenezer

Year	Number	Description
1983	DA0251/83	Application for a Youth Camp
1985	BA1397/85	Application for a Hall and Dormitory Block



3. PLANNING FRAMEWORK

This section provides an assessment of the proposed development in accordance with all relevant statutory planning controls.

3.1 COMMONWEALTH CONTROLS

3.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) would apply to the development of the subject land. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as matter of national environmental significance.

The proposed development would not have a significant impact on matters of national environmental significance and it is not on Commonwealth land. Therefore, the Provisions of the Act do not have application and the approval of the Minister is not required.

3.2 STATE CONTROLS

3.2.1 Environmental Planning and Assessment Act and Regulation

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) provide the framework for environmental planning in NSW. The EP&A Act and the Regulation include provisions to ensure that proposals, which have the potential to impact on the environment, are subject to detailed assessment. Under this legislation the proposed development is defined as both designated and integrated development.

3.2.1.1 Designated development

The proposed development potentially falls under the *EP&A Regulation 2000, Schedule 3, Part 1* “What is designated development?”. The following clauses are of relevance.

16 Crushing, grinding or separating works

(1) *Crushing, grinding or separating works, being works that process materials (such as sand, gravel, rock or minerals) or materials for recycling or reuse (such as slag, road base, concrete, bricks, tiles, bituminous material, metal or timber) by crushing, grinding or separating into different sizes:*

(a) that have an intended processing capacity of more than 150 tonnes per day or 30,000 tonnes per year, or

(b) that are located:

(i) within 40 metres of a natural waterbody or wetland, or

(ii) within 250 metres of a residential zone or dwelling not associated with the development.

(2) This clause does not apply to development specifically referred to elsewhere in this Schedule.



As the proposed development's planned production capacity is 20,000 tonnes per year, 16(1)(a) does not apply. However, 16(1)(b)(ii), does apply as the proposal is less than 200 m east of the nearest dwelling that is not associated with the development.

In addition, the proposed development is captured by Clauses 32(1)(d)(i), (ii) and (vi) under Schedule 3, Part 1 of the *Environmental Planning and Assessment Regulation 2000*, as reported below.

32 Waste management facilities or works

(1) *Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recycle, recover, use or reuse material from waste and:*

(a) that dispose (by landfilling, incinerating, storing, placing or other means) of solid or liquid waste:

(i) that includes any substance classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or

(ii) that comprises more than 100,000 tonnes of "clean fill" (such as soil, sand, gravel, bricks or other excavated or hard material) in a manner that, in the opinion of the consent authority, is likely to cause significant impacts on drainage or flooding, or

(iii) that comprises more than 1,000 tonnes per year of sludge or effluent, or

(iv) that comprises more than 200 tonnes per year of other waste material, or

(b) that sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse and:

(i) that handle substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or

(ii) that have an intended handling capacity of more than 10,000 tonnes per year of waste containing food or livestock, agricultural or food processing industries waste or similar substances, or

(iii) that have an intended handling capacity of more than 30,000 tonnes per year of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material, or

(c) that purify, recover, reprocess or process more than 5,000 tonnes per year of solid or liquid organic materials, or

(d) that are located:

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

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

(iii) within a drinking water catchment, or

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

(v) on a floodplain, or

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

(2) *This clause does not apply to:*

(a) development comprising or involving any use of sludge or effluent if:

(i) the dominant purpose is not waste disposal, and



- (ii) *the development is carried out in a location other than one listed in subclause (1) (d), above, or*
- (b) *development comprising or involving waste management facilities or works specifically referred to elsewhere in this Schedule, or*
- (c) *development for which State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas requires consent.*

The nearest waterway is a wetland approximately 100 m to the north-east on the property border, there is potential presence of acid sulfate soils near the site (but highly unlikely to be present at the site), the proposal is less than 200 m east of the nearest dwelling, not associated with the development.

Due to position of the development, its proximity to a natural waterway and nearest residential receptor, and the nature of its soils, the proposed development constitutes designated development. An Environmental Impact Statement (EIS) is required to accompany an application for designated development.

3.2.1.2 Integrated development

Part 4, Division 4.8, Section 4.46 of the EP&A Act defines what constitutes an “Integrated development”. Integrated development is development (not being State significant development or complying development) that requires development consent and one or more of the following licenses or approvals listed in Table 3-1.

Table 3-1: Licence/Approval Requirements as Integrated Development

Legislation	Require License or Approval
Coal Mine Subsidence Compensation Act 2017	No
Fisheries Management Act 1994	No
Heritage Act 1977	No
Mines Subsidence Compensation Act 1961	No
Mining Act 1992	No
National Parks and Wildlife Act 1974	No
Petroleum (Onshore) Act 1991	No
Protection of the Environment Operations Act 1997	Yes
Roads Act 1993	No
Rural Fires Act 1997	No
Water Management Act 2000	No

Clause 16 and Clause 34 of Schedule 1 of the *Protection of the Environment Operations (POEO) Act 1997* are of relevance to the proposed development and are discussed below.

Clause 16 of Part 1 in Schedule 1 of the POEO Act lists premise-based **crushing grinding or separating** activities that require a licence. The clause is as follows:

16 *Crushing, grinding or separating*

- (1) *This clause applies to crushing, grinding or separating, meaning the processing of materials (including sand, gravel, rock or minerals, but not including waste of any description) by crushing, grinding or separating them into different sizes.*



(2) The activity to which this clause applies is declared to be a scheduled activity if it has a capacity to process more than 150 tonnes of materials per day or 30,000 tonnes of materials per year.

The proposed development has a planned production capacity of 20,000 tonnes per year, therefore clause 16 does not apply.

Clause 34 of the Part 1 in Schedule 1 of the POEO Act lists premise-based **resource recovery** activities that require a licence and is as follows.

34 Resource recovery

(1) This clause applies to the following activities:

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.

recovery of hazardous and other waste, meaning the receiving of hazardous waste, restricted solid waste or special waste (other than asbestos waste or waste tyres) from off site and its processing, otherwise than for the recovery of energy.

recovery of waste oil, meaning the receiving of waste oil from off site and its processing, otherwise than for the recovery of energy.

recovery of waste tyres, meaning the receiving of waste tyres from off site and their processing, otherwise than for the recovery of energy.

(2) However, this clause does not apply to the recovery of stormwater or the processing of any of the following:

(a) contaminated soil,

(b) contaminated groundwater,

(c) sewage within a sewage treatment system (whether or not that system is licensed).

(2A) This clause also does not apply to the receiving of waste at premises from off site and its processing if:

(a) the waste is to be sold or supplied from those premises as landscaping material (that is, as lawful soil amendments or for landscape gardening) and nothing else occurs in respect of the waste at the premises other than blending, mixing, packaging or storage of the waste for the purpose of that sale or supply, and

(b) the waste is virgin excavated natural material or meets all of the conditions of a resource recovery order (made under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014) at the time it is received, and

(c) the waste does not include any liquid waste or biosolids that are not general solid waste (non-putrescible), and

(d) no other activity is carried out at the premises that would result in the premises being a scheduled waste facility within the meaning of the Protection of the Environment Operations (Waste) Regulation 2014.

(3) Each activity referred to in Column 1 of Table 3-2 to this clause is declared to be a scheduled activity if:

(a) it meets the criteria set out in Column 2 of that Table, and

(b) either:

(i) less than 50% by weight of the waste received in any year requires disposal after processing, or

(ii) an exemption granted under Part 9 of the Protection of the Environment Operations (Waste) Regulation 2014 exempts the person carrying out the activity from the requirements of section 48 (2) as they apply to waste disposal (application to land), waste disposal (thermal treatment), waste processing (non-thermal treatment) and waste storage.



Table 3-2: Resource Recovery Scheduled Activity

Activity	Criteria
recovery of general waste	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) involves processing more than 6,000 tonnes of waste per year

Table 3-2 shows the criteria for resource recovery of general waste under Clause 34. As the proposal will receive more than 6,000 tonnes of C&D waste (not exceeding 20,000), it constitutes an integrated development and requires an Environment Protection Licence (EPL). Furthermore, the site would have the capacity to store up to 3,000 tonnes at any one time, therefore falls under the definition of waste storage under Clause 42 of the POEO Act.

3.2.1.3 Section 4.15 (1) – Matters for Consideration

Under Section 4.15 of the EP&A Act, in determining a development application a consent authority is to take into consideration such of the following matters as are relevant to the development, the subject of the development application.

(a) *The provisions of:*

(i) *Any environmental planning instrument*

The *Hawkesbury Local Environmental Plan (HLEP) 2012* applies to the subject land. The subject land is zoned RU1 Primary Production. Under the provisions of this zone the proposed use is prohibited. However, the proposed use as a waste or resource management facility is permitted with consent under Clause 121 of Division 23, Part 3, of the *State Environmental Planning Policy (SEPP) (Infrastructure) 2007*, as reported below in Section 3.2.4.3. The proposal is generally consistent with zone objectives as demonstrated in Section 3.3.1.1.

(ii) *Any draft environmental planning instruments that have been placed on public exhibition.*

None at this stage.

(iii) *Any Development Control Plans*

The proposed use has been assessed in accordance with the Hawkesbury DCP 2002 in Section 3.3.2.

(iv) *Any matters prescribed by the regulations.*

None at this stage.

(b) The likely impact of the development including environmental impacts in both the natural and built environment and social and economic impacts in the locality.



- *Context and Setting*

The proposed use will complement the surrounding area and strengthen the overall economic development of the area.

- *Potential Impact on Adjoining Properties*

There will be no negative impact on the adjoining or surrounding industrial or other adjoining properties.

- *Access, Transport and Traffic*

A traffic and parking assessment has been undertaken and found that the proposed design of the development is acceptable in all aspects of its traffic design. The nearby intersections perform well to accommodate additional traffic of the development site. There is no public parking opportunities near the development, all parking demand would be contained on site.

23 to 48 tonne trucks would be used for the delivery and dispatch of materials. Trucks of this size accessing the site may require the surface of Sargents Road to be upgraded.

- *Public Domain*

The proposed use will have a positive contribution to the public domain.

- *Utilities*

The existing utilities are provided to service the proposed development.

- *Heritage*

There are no heritage issues.

- *Other Land Resources*

The proposed development will utilise valuable resources removed from other development sites.

- *Critical Habitat*

The land does not include or comprise critical habitat.

- *Air and Microclimate*

There are no microclimate issues. An air quality impact assessment has been conducted and found that there will be no additional days of exceedance for dust and that the dust control measures proposed for the site activities are considered effective.



- *Waste*

Waste generated would be minor as the majority of material brought onto site would be processed for reuse. Any waste that is generated that cannot be reused will be stored in designated waste bins on site and disposed of at an appropriate licensed waste facility.

No wastewater would be generated. Stormwater runoff will be treated onsite and require on-site detention basins.

- *Energy*

The proposed operation would not involve energy intensive activities therefore there are no energy issues.

- *Noise*

Detailed noise impact assessments have been conducted in accordance with the NSW Noise Policy for Industry, the NSW Interim Construction Noise Guideline and the NSW Road Noise Policy. The noise assessments concluded that the activities proposed by the proponent were found to be within the framework of the NSW Noise Policy for Industry. The noise generating scenarios are predicted to comply with the project specific noise levels at all receivers.

- *Natural Hazards*

There are no acknowledged natural hazards.

- *Social Impact in the Locality*

There are no negative social impacts.

- *Economic Impact in the Locality*

The proposed use will contribute to the economic development of the area.

- *Site Design and Building Form*

The proposed building design and form has been developed to complement the area by screening the operations within a building and providing landscaping that would improve the site appearance from all viewpoints. The building design is in accordance with relevant DCP requirements and the Building Code of Australia. The site has been designed to ensure that any stockpiled material would be stored within designated storage bays and visually screened from surrounding properties.

- *Construction*

The construction works will include forming the platform for the site. Erect two buildings, establish a car parking area and weighbridge, external storage bays and other required ancillary infrastructure.



- *Cumulative Impacts*

There are no cumulative impact issues given the nature of this locality.

(c) The suitability of the site for the development.

The proposed development is appropriate for this site.

(d) Any submissions made in accordance with the Act.

No submissions at this stage.

(e) The public interest

There are no aspects of the proposed use that would be contrary to the public interest.

3.2.2 Biodiversity Conservation Act 2016

The subject land is not biodiversity certified land within the meaning of Part 8 of the *Biodiversity Conservation Act 2016*. Hawkesbury City Council advised that Council's vegetation mapping shows that the subject land contains shale sandstone transition forest which is listed as an endangered ecological community under Schedule 2 of the Biodiversity Conservation Act 2016. In addition, from November 2019 developments within the Hawkesbury City Council LGA that involve clearing of native vegetation in excess of 0.25 hectares must be assessed using the Biodiversity Assessment Method (BAM) therefore a Biodiversity Development Assessment Report was undertaken.

3.2.3 NSW Heritage Act 1977

The subject land does not contain an item of environmental heritage and there are no items of environmental heritage in the immediate vicinity of the subject land that would be impacted by its proposed use. Therefore, there are no issues in relation to the *NSW Heritage Act 1977*.

3.2.4 State and Regional Environmental Planning Policies

A number of State Environmental Planning Policies (SEPPs) and Deemed SEPPs (previously known as Regional Environmental Plans) as well as Draft SEPPs, apply to the subject land and are listed in Table 3-3. The most relevant SEPPs are then discussed in greater detail.

Table 3-3: State and Regional Environmental Planning Policies

Policy	Comments
SREP No 20 – Hawkesbury Nepean River (No 2 – 1997)	No application: Discussed below
SEPP (Affordable Rental Houseing) 2009	No application
SEPP (Coastal Management) 2018	No application: Discussed below
SEPP (Building Sustainability Index: BASIX) 2004	No application
SEPP (State Significant Precincts) 2005	No application: Discussed below



Table 3-3: State and Regional Environmental Planning Policies

Policy	Comments
SEPP (Miscellaneous Consent Provisions) 2007	No application
SEPP (State and Regional Development) 2011	No application: Discussed below
SEPP (Exempt and Complying Development Codes) 2008	No application
SEPP (Housing for Seniors or People with a Disability) 2004	No application
SEPP (Infrastructure) 2007	Applies. Discussed below.
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	No application
SEPP No 1 – Development Standards	No application
SEPP No 19 – Bushland in Urban Areas	No application
SEPP No 21 – Caravan Parks	No application
SEPP No 33 – Hazardous and Offensive Development	No application: Discussed below
SEPP No 44 – Koala Habitat Protection	No application
SEPP No 50 – Canal Estate Development	No application
SEPP No 55 – Remediation of Land	Applies: Discussed below
SEPP No 62 – Sustainable Aquaculture	No application
SEPP No 64 – Advertising and Signage	Applies. Discussed below
SEPP No 65 – Design Quality of Residential Apartment Development	No application
SEPP No 70 – Affordable Housing	No application
SEPP (Primary Production and Rural Development) 2019	No application
SEPP (Vegetation in Non-Urban Areas) 2017	No application
Draft SEPP – Integrating Land Use and Transport	No application
Draft SEPP (Environment) 2017	No application

3.2.4.1 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

The proposed development would only store minor quantities of chemicals and dangerous goods site and, therefore does not trigger the thresholds listed in SEPP No. 33 – Hazardous and Offensive Development and would not fit the definition of ‘potentially hazardous industry’ or ‘hazardous storage establishment’. This is demonstrated in Section 8.7.2.

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

The construction of the resource recovery facility and terracing will require excavation works and therefore the proposal would be assessable under SEPP No. 55 – Remediation of Land. Phase I preliminary site investigation (contamination report) has been undertaken as part of the environmental assessment process (Appendix 3).

Historical information shows that the site has more recently been used for equestrian purposes, and there is no evidence of onsite activities that may have caused contamination. No additional investigations are considered warranted.

The site is considered to be suitable for the proposed development in its current condition, and therefore no remediation is required.



3.2.4.3 State Environmental Planning Policy (Infrastructure) 2007

The resource recovery component of the proposal is permitted with consent under Clause 121 of Division 23, Part 3, of the *State Environmental Planning Policy (SEPP) (Infrastructure) 2007*, as reported below.

121 Development permitted with consent

(1) Development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone.

Where:

prescribed zone means any of the following land use zones or a land use zone that is equivalent to any of those zones:

- (a) RU1 Primary Production,**
- (b) RU2 Rural Landscape,**
- (c) IN1 General Industrial,**
- (d) IN3 Heavy Industrial,**
- (e) SP1 Special Activities,**
- (f) SP2 Infrastructure.**

waste or resource management facility means a waste or resource transfer station, a resource recovery facility or a waste disposal facility.

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 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 8 of the SEPP (infrastructure) 2007, where there is an inconsistency between this Policy and other environmental planning instruments, such as the Hawkesbury LEP 2012, this Policy prevails.

Therefore, the development for the purposes of the resource recovery facility is permissible with consent.

3.2.4.4 State Environmental Planning Policy (State Significant Precincts) 2005

The development is not within a state significant precinct and the provisions of the SEPP (State Significant Precincts) 2005 do not apply.



3.2.4.5 State Environmental Planning Policy (State and Regional Development) 2011

The aims of SEPP (State and Regional Development) 2011 is to identify development that is state significant development, state significant infrastructure or critical state significant infrastructure. Under Clause 8 (1) of the *State Environmental Planning Policy (State and Regional Development) 2011*, development is potentially state significant development if it is specified in Schedule 1 or Schedule 2. Clause 23(3) of Schedule 1 is relevant to the proposed activities:

23 Waste and resource management facilities

(1) Development for the purpose of regional putrescible landfills or an extension to a regional putrescible landfill that:

- (a) has a capacity to receive more than 75,000 tonnes per year of putrescible waste, or*
- (b) has a capacity to receive more than 650,000 tonnes per year of putrescible waste over the life of the site, or*
- (c) is located in an environmentally sensitive area of State significance.*

(2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.

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

(4) Development for the purpose of waste incineration that handles more than 1,000 tonnes per year of waste.

(5) Development for the purpose of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste.

(6) Development for the purpose of any other liquid waste depot that treats, stores or disposes of industrial liquid waste and:

- (a) handles more than 10,000 tonnes per year of liquid food or grease trap waste, or*
- (b) handles more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste.*

The proposed development is not state significant as it involves the handling of less than 20,000 tonnes per year of waste. Additionally, the subject site is not an identified site under Schedule 2 of the SEPP.

3.2.4.6 Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No 2—1997)

The Sydney Regional Environmental Plan No. 20 (SREP 20) applies to the subject land. The following provides an assessment of the proposed development in accordance with SREP 20.

The aim of the SREP is to *protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context*. As demonstrated throughout this EIS, the proposed development does not involve the removal of water from the river system or release of wastewater and/or wastes to waters. It will be essentially a closed system that would use rain water, recycled water and would treat or dispose



of any wastewater and solid waste using licensed waste contractors. The site would employ safeguards that prevent the release of potential contaminants. Therefore, the proposed development is consistent with the aim of the SEPP.

General planning considerations are provided in Clause 5 of the SREP. These are as follows:

- (a) the aim of this plan, and*
- (b) the strategies listed in the Action Plan of the Hawkesbury-Nepean Environmental Planning Strategy, and*
- (c) whether there are any feasible alternatives to the development or other proposal concerned, and*
- (d) the relationship between the different impacts of the development or other proposal and the environment, and how those impacts will be addressed and monitored.*

The aim of the plan is addressed above.

The Hawkesbury-Nepean Catchment Action Plan 2013-2023 provides strategies on pages 9 and 10. The proposed development is in line with these strategies as it would maintain safeguards that would protect aquatic ecosystems whilst operations are undertaken.

Feasible alternatives to the proposed development have been considered in Section 1.4 of this EIS.

Potential impacts of the development and how these will be minimised and monitored are addressed in Section 8.

Therefore, the proposed development is consistent with the aim and general provisions of the Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River.

Clause 11(18) includes particular Provisions in respect of Waste management facilities or works being:

(18) Waste management facilities or works

Definition:

Development for the purpose of waste management facilities or works described in Schedule 3 (Designated Development) to the Environmental Planning and Assessment Regulation 1994.

Consent required.

Additional matters for consideration by the consent authority:

- (a) Any potential for groundwater contamination.*
- (b) The adequacy of the proposed leachate management system and surface water controls.*
- (c) The long-term stability of the final landform and the adequacy of the site management plan.*
- (d) If extraction of material is involved in the creation or other development of the waste management site, whether the extractive operation will have an adverse impact on the river system.*



These matters for consideration have been addressed in this EIS, relevant sections are:

- Groundwater contamination is addressed in Section 8.3.8
- Leachate management and surface water controls are also addressed in Section 8;
- Site rehabilitation is addressed in Section 5.11; and
- No extraction of material is proposed.

It can be determined that the proposed use is not inconsistent with the Aims and Objectives of the Policy, whilst the matters for consideration are satisfied.

3.2.4.7 State Environmental Planning Policy No. 64 – Advertising and Signage

This State Environmental Planning Policy is to be addressed as per pre-lodgement meeting notes with Hawkesbury City Council on 27 February 2018.

3 Aims, objectives etc

(1) This Policy aims

(a) to ensure that signage (including advertising):

(i) is compatible with the desired amenity and visual character of an area, and

(ii) provides effective communication in suitable locations, and

(iii) is of high quality design and finish, and

(b) to regulate signage (but not content) under Part 4 of the Act, and,

(c) to provide time-limited consents for the display of certain advertisements, and

(d) to regulate the display of advertisements in transport corridors, and

(e) to ensure that public benefits may be derived from advertising in and adjacent to transport corridors.

(2) This Policy does not regulate the content of signage and does not require consent for a change in the content of signage.

Any signage will take in consideration the above aims and objectives to be consistent with this state environmental planning policy.

3.2.4.8 State Environmental Planning Policy (Coastal Management) 2018

Division 1 Coastal wetlands and littoral rainforests area

10 Development on certain land within coastal wetlands and littoral rainforests area

1) The following may be carried out on land identified as “coastal wetlands” or littoral rainforest on the Coastal Wetlands and Littoral Rainforests Area Map only with development consent:

(a) the clearing of native vegetation within the meaning of Part 5A of the Local Land Services Act 2013,

(b) the harm of marine vegetation within the meaning of Division 4 of Part 7 of the Fisheries Management Act 1994,

(c) the carrying out of any of the following:

(i) earthworks (including the depositing of material on land),

(ii) constructing a levee,

(iii) draining the land,

(iv) *environmental protection works.*

The area of proposed works is not located within land mapped as Coastal Wetlands as shown in Figure 3-1 and therefore State Environmental Planning Policy (Coastal Management) 2018 does not apply.

Figure 3-1: Coastal wetlands map showing proposed development area



3.3 LOCAL CONTROLS

3.3.1 Local Environmental Plan

The *Hawkesbury Local Environmental Plan 2012* applies to the subject site.

The proposed development is considered to be consistent with the particular aims of the Plan under Part 1, Clause 1.2 (2), specifically (a) and (d) as follows:

- a) *to provide the mechanism for the management, orderly and economic development and conservation of land in Hawkesbury,*



- b) to provide appropriate land in area, location and quality for living, working and recreation activities and agricultural production,*
- c) to provide attractive landscapes and preserve places of natural beauty, including wetlands and waterways,*
- d) to protect and enhance the natural environment in Hawkesbury and to encourage ecologically sustainable development,*
- e) to conserve and enhance buildings, structures and sites of recognised significance that are part of the heritage of Hawkesbury for future generations,*
- f) to provide opportunities for the provision of secure, appropriate and affordable housing in a variety of types and tenures for all income groups in Hawkesbury,*
- g) to encourage tourism-related development that will not have significant adverse environmental effects or conflict with other land uses in the locality.*

Comment: The development proposes to use an area of the site that has already been cleared and the remaining area would be maintained for existing rural uses including the equestrian centre and would conserve the densely vegetated area to the south of the proposed development area. The building proposed is a large rural style shed that would complement the rural surroundings. Although trees are to be removed within the development area of the site, the landscape plan proposes new plantings to provide attractive landscapes being in line with bushfire requirements. The proposal conforms to the principles of ecological sustainable development as it has been designed with measures in place to prevent environmental degradation.

3.3.1.1 Zone Objectives

The land zoning for the subject land is described as RU1 – Primary Production under the provisions of the *Hawkesbury Local Environmental Plan 2012*, which applies to the subject site.

It should be noted that the resource recovery component of the proposal is permissible within the land zoning under the iSEPP and that the iSEPP prevails over the Hawkesbury LEP. The resource recovery component of the proposal would complement the landscape supply business by generating materials used for landscape supply.

The proposal is consistent with the requirements of the iSEPP, however, Council requested the EIS demonstrates consistency with the zone objectives and a discussion is provided below.

The following provides a discussion regarding the RU1 zone objectives.

Zone RU1 Primary Production

1 Objectives of zone

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*

Comment: The proposed development is confined to an area of the site that has already been substantially cleared and disturbed. Site history indicates that after 1975 the proposed development area had been almost fully cleared. The northern area has been used as an equestrian centre for many years. The remaining area is undisturbed vegetated land. The



development supports primary industry production by accepting VENM, ENM and vegetated material and converting these into a variety of landscaping materials often used in primary industry production. The proposed development encourages diversity in primary industry enterprises and systems appropriate to the area by providing cost effective resource recovery for surrounding rural land development. The existing land uses on the site would also be maintained. In this way, the development does not preclude this zone objective.

- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*

Comment: The proposed development minimises the fragmentation and alienation of resource lands. A land use conflict risk assessment has been undertaken as part of the EIS and is presented in Section 8.4.4. Risk ratings were found to be 9 or below assigning a low potential for land use conflict. Therefore the proposal supports this zone objective.

- *To encourage agricultural activities that do not rely on highly fertile land.*

Comment: The proposed development will not rely on highly fertile land and supports this zone objective.

- *To ensure that development occurs in a way that does not have a significant adverse effect on water catchments, including surface and groundwater quality and flows, land surface conditions and important ecosystems such as waterways.*

Comment: The proposed development has been designed with measures in place to prevent significant impacts to receiving waters. As the incoming materials and products would be inert in nature, this significantly minimises the potential for contamination to water and therefore supports this zone objective.

- *To promote the conservation and enhancement of local native vegetation including the habitat of threatened species, populations and ecological communities by encouraging development to occur in areas already cleared of vegetation.*

Comment: The proposed development is located on already cleared and disturbed land. The densely vegetated area located on the site to the south of the proposal would be maintained thereby conserving this native vegetation. The proposed development supports this zone objective.

- *To ensure that development retains or enhances existing landscape values including a distinctive agricultural component.*

Comment: As the proposed development is located on an area of the site that is already cleared of vegetation, a landscaping plan has been proposed to ensure that the appearance of the site remains agricultural. The shed is a typical rural style shed and the car parking area, storage bays and weighbridge would be adequately screened from site by existing vegetation and additionally new plantings at the entrance to the site. In this way, the proposal supports this zone objective.

- *To ensure that development does not detract from the existing rural character or create unreasonable demands for the provision or extension of public amenities and services.*



Comment: As stated previously, the proposed development would not detract from the existing rural character as it will be located on an area of land already cleared of vegetation and is designed with rural character of the area in mind, would provide new plantings at the site entrance to enhance the rural character and screen car parking and storage areas. No provision for public amenities or services is needed.

The proposal is consistent with the zone objectives and would not detract from the rural character of the area.

3.3.1.2 Permissibility

The proposed development is for a landscaping material supply business and a resource recovery facility. Landscaping material supplies are permissible with consent within the RU1 Primary Production Zone. However, resource recovery facilities are not a permitted use with consent within the RU1 Zone, under the Hawkesbury LEP 2012 as shown in bold below. The Resource recovery component of the business is permitted with consent under Clause 121 of Division 23, Part 3, of the *State Environmental Planning Policy (SEPP) (Infrastructure) 2007*, as discussed in Section 3.2.4.3. Additionally, the resource recovery component would complement the landscape supply component by providing wastes that can be converted into materials used for landscape supplies.

2 Permitted without consent

Bed and breakfast accommodation; Environmental protection works; Extensive agriculture; Home occupations

3 Permitted with consent

*Animal boarding or training establishments; Boarding houses; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Caravan parks; Cemeteries; Centre-based child care facilities; Charter and tourism boating facilities; Community facilities; Correctional centres; Crematoria; Dual occupancies (attached); Dwelling houses; Educational establishments; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Flood mitigation works; Food and drink premises; Forestry; Funeral homes; Health consulting rooms; Helipads; Heliports; Home-based child care; Home industries; Hospitals; Intensive livestock agriculture; Intensive plant agriculture; Jetties; **Landscaping material supplies**; Moorings; Open cut mining; Places of public worship; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers' dwellings; Tourist and visitor accommodation; Truck depots; Veterinary hospitals; Water recreation structures; Water storage facilities*

4 Prohibited

Any development not specified in item 2 or 3



Relevant definitions include:

Landscaping material supplies means a building or place used for the storage and sale of landscaping supplies such as soil, gravel, potting mix, mulch, sand, railway sleepers, screenings, rock and the like.

waste or resource management facility means any of the following:

- (a) a resource recovery facility,
- (b) a waste disposal facility,
- (c) a waste or resource transfer station,
- (d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).

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

3.3.1.3 General LEP Requirements

The provisions of the Hawkesbury LEP 2012 are assessed in Table 3-4 to Table 3-6. Of relevance to the proposed development are Part 4 Principal Development Standards, Part 5 Miscellaneous Provisions and Part 6 Additional Local Provisions.

Table 3-4: Hawkesbury Local Environmental Plan 2012 Part 4 Principal Development Standards

Clause	Comments	Compliance
4.1 Minimum subdivision lot size	The proposed development does not involve the subdivision of land	No application
4.1AA Minimum subdivision lot size for community title schemes	The proposed development does not involve the subdivision of land	No application
4.1A Minimum subdivision lot size for strata plan schemes in certain zones	The proposed development does not involve the subdivision of land	No application
4.1B Minimum lot size for certain split zone lots	Not applicable	No application
4.1C Exceptions to minimum subdivision lot size for rural and large lot residential zones	The proposed development does not involve the subdivision of land	No application
4.1D Exceptions to minimum subdivision lot size for certain land	The proposed development does not involve the subdivision of land	No application
4.1E Exceptions to minimum subdivision for Grose Wold	The proposed development does not involve the subdivision of land nor is it in Grose Wold	No application
4.1 F Exceptions to minimum subdivision lot size for certain land in North Richmond	The proposed development does not involve the subdivision of land nor is it in North Richmond	No application



Table 3-4: Hawkesbury Local Environmental Plan 2012 Part 4 Principal Development Standards

Clause	Comments	Compliance
4.1 G Restriction on the number of lots created by subdivision of certain land	The proposed development does not involve the subdivision of land	No application
4.2 Rural subdivision	The proposed development does not involve the subdivision of land	No application
4.2A Residential development and subdivision prohibited on certain land	The proposed development does not involve the subdivision of land	No application
4.2B Additional requirements for subdivisions in certain flood planning areas	The proposed development does not involve the subdivision of land	No application
4.3 Height of buildings	The maximum height of a building built in the RU1 Primary Production zone of the site is – 10 m as indicated by the Height of Buildings Map – Sheet HOB_008C. The proposed building height is 12.8 m which exceeds the maximum height of buildings in this clause.	Applies
4.4 Floor space ratio	Not adopted	No application
4.5 Calculation of floor space ratio and site area	Not adopted	No application
4.6 Exceptions to development standards	The height of the proposed building exceeds the maximum height of buildings under Clause 4.3. Therefore a request for variation to this standard will be required.	Applies

Table 3-5: Hawkesbury Local Environmental Plan 2012 Part 5 Miscellaneous Provisions

Clause	Comments	Compliance
5.1 Relevant acquisition authority	No part of the land is required to be acquired for a public purpose	No application
5.1A Development on land intended to be acquired for public purposes	Subject site is located on land zoned RU1 Primary Production	No application
5.2 Classification and reclassification of public land	No part of the land is classified as public land	No application
5.3 Development near zone boundaries	Not applicable	No application
5.4 Controls relating to miscellaneous permissible uses	The existing business is not of the type described in this clause	No application
5.5	Repealed	Repealed
5.6 Architectural roof features	There will be no roof features/ decorative elements of visual interest	No application
5.7 Development below mean high water mark	Not applicable	No application



Table 3-5: Hawkesbury Local Environmental Plan 2012 Part 5 Miscellaneous Provisions

Clause	Comments	Compliance
5.8 Conversion of fire alarms	The proposed modification does not involve the conversion of a fire alarm system	No application
5.9, 5.9AA	Repealed	Repealed
5.10 Heritage conservation	There are no heritage items, Aboriginal objects or a building, work, relic or tree within a heritage conservation area located within the subject land	No application
5.11 Bush fire hazard reduction	Relates to the Rural Fires Act 1997	No application
5.12 Infrastructure development and use of existing buildings of the Crown	The proposed development does not affect a building of the Crown	No application
5.13 Eco-tourist facilities	Not applicable	No application
5.14 Sliding Spring Observatory – maintaining dark sky	Not adopted	Not adopted
5.15 Defence communications facility	Not adopted	Not adopted

Table 3-6: Hawkesbury Local Environmental Plan 2012 Part 6 Additional Local Provisions

Clause	Comments	Compliance
6.1 Acid sulfate soils	Land is identified as containing Class 5 and Class 3 acid sulfate soils.	Applies. A preliminary Acid Sulfate Soil Assessment is provided as Appendix 4
6.2 Earthworks	Minor earthworks are required for the footings and foundations of the proposed building.	Earthworks are ancillary to the development application. Complies.
6.3 Flood planning	The Hawkesbury Floodplain Risk Management Study and Plan identifies the subject land as being located outside the flood hazard categories with the exception of the area at the boundaries of the site along the north and east of the site. Some part of this land is within a “high flood hazard” category.	A Flood Study is required and provided in this EIS.



Table 3-6: Hawkesbury Local Environmental Plan 2012 Part 6 Additional Local Provisions

Clause	Comments	Compliance
6.4 Terrestrial biodiversity	The subject land contains an area of Significant Vegetation and Connectivity Between Significant Vegetation. The area of land on the south of the site would not be disturbed. The remaining area has been previously disturbed and is already being used for rural purposes. Some tree removal will be required. A BDAR, landscaping concept plan, arboricultural implication assessment and tree management plan is provided.	Complies
6.5 Wetlands	The subject land does not contain an area of Wetlands.	No application
6.6 Development in areas subject to aircraft noise	The development is not within an ANEF contour of 20 or greater to the RAAF Base Richmond.	No application
6.7 Essential services	Electricity will be supplied from the mains, water use from on-site rainwater tanks, sewage will be disposed of appropriately, adequate stormwater drainage will be on site, and there will be suitable road access.	Complies
6.8 Arrangements for designated State public infrastructure	The land is not identified as 'Density Control' on the Pitt Town Subdivision and Designated State Public Infrastructure Map	No application
6.9 Additional requirements for subdividing in Pitt Town Heritage Area	Not applicable	No application
6.10 Certain development on Lot 1, DP 827148, Richmond Road, Clarendon	Not applicable	No application
6.11 Residential accommodation at Johnston and New Streets, Windsor	Not applicable	No application
6.12 Certain development at Richmond Lowlands	Not applicable	No application

The proposed development is considered to be consistent with all relevant provisions of the Hawkesbury LEP 2012, with the exception of Clause 4.3 – Height of buildings. Therefore, Clause 4.6 – Exceptions to development standards applies and written request is required to justify the contravention.



3.3.2 Development Control Plans

The land is affected by the Hawkesbury Development Control Plan 2002.

The objectives of this DCP are:

- a) To provide a comprehensive document that contains detailed development controls for development which meets community expectations and addresses the key environmental planning issues of the Hawkesbury LGA;*
- b) To promote economically, socially and environmentally sustainable development within the City of Hawkesbury;*
- c) To enable an aesthetically pleasing and functional development that sympathetically relates to adjoining and nearby development;*
- d) To maintain and enhance the environmental and cultural heritage of the Hawkesbury LGA;*
- e) To involve the local community in the planning process by ensuring openness, accountability and transparency in the decision-making process;*
- f) To set out clear processes, procedures and requirements to facilitate an integrated and consistent framework for dealing with development assessment;*
- g) To ensure that development will respond to its context and not detrimentally affect the surrounding development; and*
- h) To promote the Ecologically Sustainable Development (ESD) principles including water sensitive urban design, climate responsive building design, energy efficiency, and selection/use of recycled materials.*

The requirements of relevance to the proposed development are contained within Part C General Guidelines and Part D-2 Specific Development – Industrial Development and area assessed in Table 3-7 and Table 3-8. The assessments provided within this EIS adequately address these requirements.

Table 3-7: General Guidelines within Part C of the Hawkesbury Development Control Plan 2002

DCP Guidelines	Comments
1. Landscaping	Vegetation within the southern portion of the site will remain. There will be some vegetation requiring removal for the construction of the buildings and establishment of the external stockpile storage areas, car parking areas and driveways. Trees to be removed are shown on the landscape plan. A landscape plan is provided with the application.
2. Car Parking and Access	There will be adequate on-site parking for staff and visitors. Parking and access is addressed in the Traffic and Parking Impact Assessment in Appendix 5.
3. Signs	Appropriate signage will be used.
4. Soil Erosion and Sediment Control	An erosion and sediment control plan (ESCP), also called a Sedimentation plan is provided with the application in Appendix 9 and would be implemented as part of the construction works.
5. Bushfire Prone Land	All of the land is identified as bushfire prone on the Section 10.7 Planning Certificate. A bushfire report has been provided which certifies all associated plans.
6. Energy Efficiency	The site will endeavour to be energy efficient where possible.



Table 3-7: General Guidelines within Part C of the Hawkesbury Development Control Plan 2002

DCP Guidelines	Comments
7. Effluent Disposal	A septic system would be installed.
8. Management of Construction and Demolition Waste	The site will correctly dispose of and recycle construction and demolition waste. A waste management plan is provided.
9. Preservation of Trees and Vegetation	A landscape plan identifies trees to be removed and shows the location of shrubs and trees to be planted. The landscape plan has been certified by the Bushfire Consultant in regards to APZ zones. An Arboricultural Implication Assessment and Tree Management Plan (Appendix 10) have been prepared by a qualified arborist to manage the existing trees during the planning and construction of the proposed development.
10. Heritage Conservation	There are no items of heritage on the site.

Table 3-8: Industrial Development within Part D of the Hawkesbury Development Control Plan 2002

DCP Guidelines	Comments
2.1 General Principles	The subject site will encourage economic development, good design and appearance.
2.2 Building Setbacks	Proposed building is setback >15 m from the street frontage. Car parking spaces are not within the first 5 m of the front boundary and would be suitably screened by landscaping. The building is sited to make adequate provision for landscaping, allowing solar access to staff recreation areas and to provide visual amenity for employees.
2.3 Relationship to Adjacent Development	The industrial land use has been designed to fit in with the rural surroundings and will be compatible with adjacent, commercial, residential and rural areas.
2.4 Building Design and Construction	The development is designed to make a positive contribution to the streetscape.
2.5 Fencing	Fencing is required for the prevention of entry of livestock and unauthorised persons. Fencing will be of a standard/style that does not detract from the landscaping or building facades.
2.6 Open Storage Areas	No open storage areas are proposed. External storage bays are well set back from the street frontage and screened from the road and adjoining land by vegetated barriers.
2.7 Environmental Issues	The relevant risk, air and noise impact assessments have been conducted.

The proposed development is considered to be consistent with all relevant requirements of the Hawkesbury Development Control Plan 2002.



4. CONSULTATION

Consultation with government departments and the local community plays an important role in ensuring that all potential environmental impacts are evaluated and the most important issues are prioritised. The following sections provide details on consultation and stakeholder engagement, such as that with regulators and government bodies. Key aspects and assessment requirements identified through the consultation process are also summarised in the following sections, together with the reference to where these aspects and requirements have been addressed in the report.

4.1 STAKEHOLDER ENGAGEMENT

Liaison with all relevant government authorities regarding the proposed development and requirements of the EIS has been on-going since the inception of the project. Consultation has been undertaken on a formal basis. Summarised below are all the regulatory stakeholders that have been consulted as part of this development application, together with the details of such consultation.

- Department of Planning and Environment (DP&E)
A request for the Secretary's Environmental Assessment Requirements (SEARs) and related Scoping Report was sent to the Planning Services Division and SEARs (document reference 1249) were provided on 10 September 2018 with requirements attached (Attachment 1). The DP&E has included input from NSW Environment Protection Authority (EPA), Office of Environment and Heritage (OEH), Department of Primary Industry (DPI) and the Rural Fire Service (RFS).
- NSW Environment Protection Authority (EPA)
Key issues and assessment requirements from the EPA were included in the SEARs.
- Department of Primary Industries (DPI)
Key issues and assessment requirements from the DPI Agriculture and DPI Fisheries were included in the SEARs.
- Office of Environment and Heritage (OEH)
The OEH reviewed the documents provided by the DP&E and had no comments to be included in the SEARs.
- Rural Fire Service (RFS)
The RFS indicated they had no objection to the proposed development and provided the following advice and requirements for the SEARs:

'A bush fire report shall be prepared by a suitably qualified person, as part of the preparation of an Environmental Impact Statement. The report should consider the aims and objectives of Planning for Bush Fire Protection, including emergency and evacuation planning, and provide recommendations that achieve a better bush fire outcome for the existing development.'



- Roads and Maritime Services (RMS)

A letter describing the proposed development was sent to the RMS on 16 May 2019. The RMS responded via email on 3 June 2019. The email is provided as Attachment 2.

- Hawkesbury City Council

A pre-lodgement meeting with Council was undertaken on 1 February 2018. Council provided specific advice regarding the proposal and this has been addressed throughout this EIS. An additional meeting was undertaken on 28 November 2019 regarding additional matters to be addressed in the EIS. The pre-lodgement notes for both meetings are provided as Attachment 7.

4.2 COMMUNITY CONSULTATION

Consultation with the residential community was undertaken on 26 September 2018 by the Principal Consultant and Environmental Scientist of Benbow Environmental (BE). A leaflet (Attachment 3) was provided with an explanation of the proposal, its location, activity and the size of the development.

Sixteen residences were visited; only four residents were at home. Leaflets were letterbox dropped where residents were absent or gates locked.

The aerial in Figure 4-1 shows the locations of residences visited.

No neighbour expressed any initial opposition to the proposal, but the predominant concern raised was the condition of Sargents Road. The concerns were several.

- The road is narrow, especially for truck use. An insufficient amount of room is available for two opposing trucks to pass.
- Sargents Road is a dirt road overlain with a thin layer of blue metal.
- The road becomes rilled after heavy rain events (was rilled when the community consultation was conducted).
- Road deterioration occurring due to more frequent truck movements.
- Dust raised by truck movements.

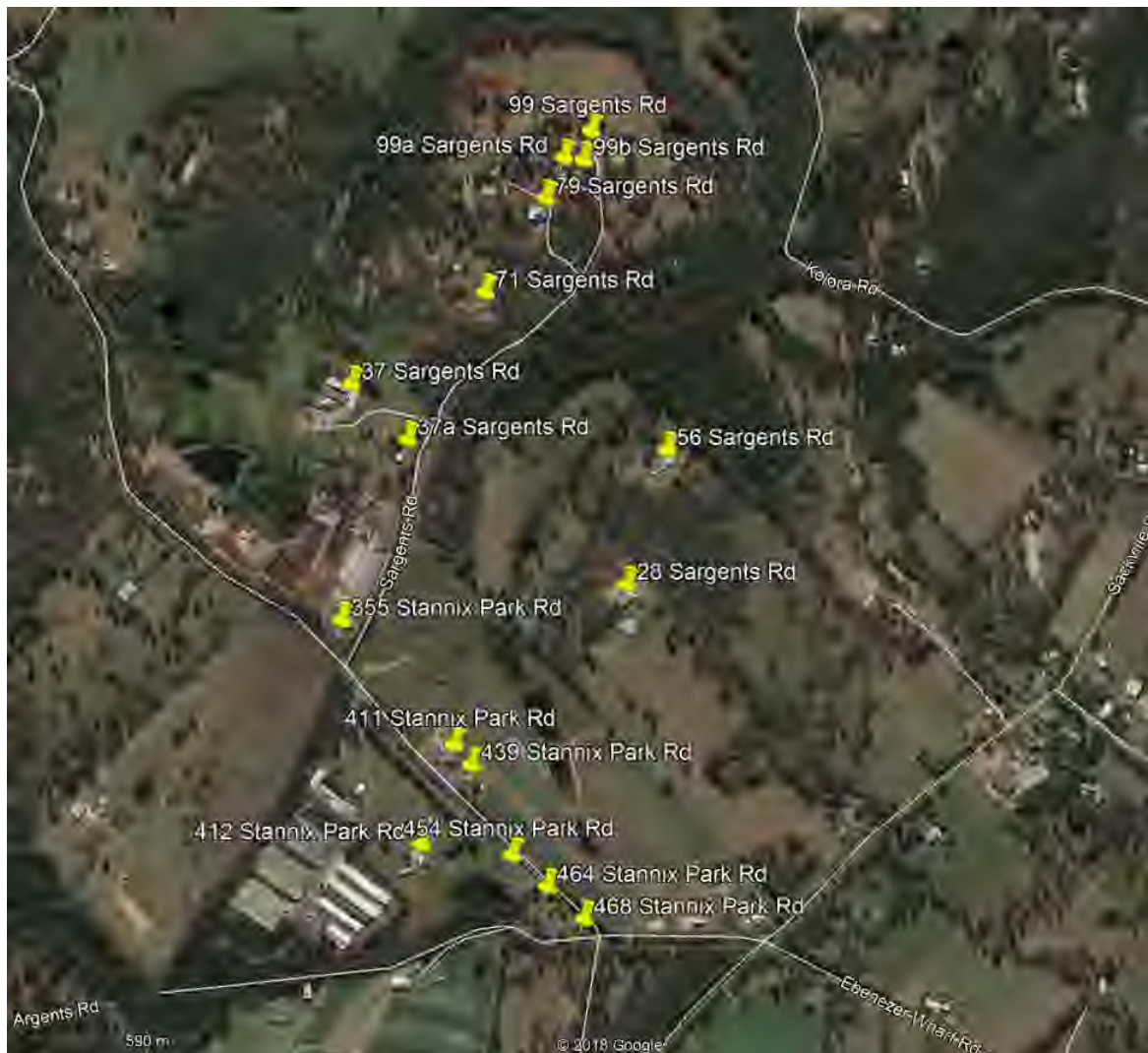
Other concerns that were raised included:

- Noise from the operation;
- Hours of operation; and
- Odour.

An invitation was extended to provide access to BE and to provide copies of the EIS. BE thanked the residents for their time and the courtesy shown.



Figure 4-1: Location of residences visited during consultation



4.3 ASSESSMENT REQUIREMENTS

The Secretary's Environmental Assessment Requirements (SEARs) obtained for the proposed development include key issues and requirements identified by the DP&E, the EPA and DPI Agriculture and DPI Fisheries, which have been provided in the following tables (Table 4-1, Table 4-2 and Table 4-4 respectively). A copy of the SEARs is also provided in Attachment 1.



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
Strategic context		
A detailed justification for the proposal and suitability of the site for the development.	15.1, 1.4.3	15-1, 1-5
A demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies.	3	3-1
A list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out;	14	14-1
Suitability of the site		
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.	1.4.3	1-5
Floor plans depicting the proposed internal layout including the location of machinery and equipment.	5.2	5-2
Traffic and transport		
Details of road transport routes and access to the site. Road traffic predictions for the development during construction and operation. An assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.	9.4	9-6
Air quality and odour		
A description of all potential sources of air and odour emissions. An air quality impact assessment in accordance with relevant Environment Protection Authority guidelines. A description and appraisal of air quality impact mitigation, management and monitoring measures.	8.1	8-1
Noise and vibration		
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, management and monitoring measures.	8.2	8-2
Soil and water		
An assessment of potential impacts to soil and water resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby the site. A detailed site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise water use at the site.	8.3, 8.4	8-7, 8-12
Details of any groundwater extraction and any works with potential to intercept the groundwater table.		



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
Characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters). Details of stormwater/ wastewater/ leachate/ firewater management systems including details of the flood liability of the site and changes to flooding behaviour. Consideration of salinity and acid sulfate soil impacts. Characterisation of the nature and extent of any contamination on the site and a description of propose management measures.		
Hazards and risk		
A preliminary risk screening completed in accordance with <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33</i> (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 <i>Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis</i> (DoP, 2011) and <i>Multi-Level Risk Assessment</i> (DoP, 2011).	0	8-11
An assessment of the risk of bushfire, including addressing the requirements of <i>Planning for Bush Fire Protection 2006</i> (RFS). Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers). Provision is to be made for their appropriate management into the future. Any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations to address this.	8.7.3.4	8-21
Waste management		
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. Details of machinery and waste processing to be used. 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 Resource Recovery Strategy 2014-21</i>.	8.6	8-2



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
Fire and incident management		
Technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including location of fire hydrants and water flow rates at the hydrant) management and contaminant measures. Details of size and volume of stockpiles and their arrangements and separation to minimise fire spread and facilitate emergency vehicle access.	8.7.3	8-13
Biodiversity		
Accurate predictions of any vegetation clearing on site or for any road upgrades. Details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies. A detailed description of the measures to avoid, minimise, mitigate and offset biodiversity impacts.	8.5	8-19
Visual		
Including an impact assessment at private receptors and public vantage points.	9.2	9-3
Heritage		
Including Aboriginal and non-Aboriginal cultural heritage	9.39.3	9-4
The Proposal		
1. Objectives of the Proposal		
- The objectives of the proposal should be clearly stated and refer to: - the size and type of the operation, the nature of the processes and the products, by-products and wastes produced - a life cycle approach to the production, use or disposal of products - the anticipated level of performance in meeting required environmental standards and cleaner production principles - the staging and timing of the proposal and any plans for future expansion - the proposal's relationship to any other industry or facility.	1.1.1	1-1



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
2. Description of the Proposal - General		
- Outline the production process including: - 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) - any life-cycle strategies for the products. - Outline cleaner production actions, including: - measures to minimise waste (typically through addressing source reduction) - proposals for use or recycling of by-products - proposed disposal methods for solid and liquid waste - 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 - 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: - actions to address any existing soil contamination - any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site) - construction timetable and staging; hours of construction; proposed construction methods - 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.	5.4	5-3
	5.10	5-7
	5.3	5-2
	Appendix 9	



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
2. Description of the Proposal - 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: - 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 - an outline of procedures for handling, transport, production and storage - the management of solid, liquid and gaseous waste streams with potential to generate emissions to air.	5.9.1 8.1	5-6 8-1
2. Description of the Proposal – 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.	5.9.2 8.2	5-6 8-2
2. Description of the Proposal - Water		
- Provide details of the project that are essential for predicting and assessing impacts to waters including: - 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) - the management of discharges with potential for water impacts - 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.	5.8.1.1 8.3	5-4 8-7



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
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.		
2. Description of Proposal – 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 e) the method for disposing of all wastes or recovered materials at the facility f) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility g) 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.	5.9.3 8.6	5-7 8-2
<i>Reference should be made to the guidelines: EPA's Waste Classification Guidelines 2014 (as amended from time to time)</i>		



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
2. Description of the Proposal - 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.	11	11-1
3. Rehabilitation		
Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).	5.11	5-8
4. Consideration of Alternatives and Justifications 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.	1.4 1.4.3	1-3 1-5



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
The Location		
1. The Location - General		
- Provide an overview of the affected environment to place the proposal in its local and regional environmental context including: - meteorological data (e.g. rainfall, temperature and evaporation, wind speed and direction) - topography (landform element, slope type, gradient and length) - surrounding land uses (potential synergies and conflicts) - geomorphology (rates of landform change and current erosion and deposition processes) - soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils) - ecological information (water system habitat, vegetation, fauna) - availability of services and the accessibility of the site for passenger and freight transport.	2 6	2-1 6-1
2. The Location - 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: - temperature and humidity - rainfall, evaporation and cloud cover - wind speed and direction - atmospheric stability class - mixing height (the height that emissions will be ultimately mixed in the atmosphere) - katabatic air drainage - re-circulation.	6, 6.6	6-1, 6-20
3. The Location - 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.	6.5	6-16



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
4. The Location - 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.	6.3	6-5
5. The Location - 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.	2.7 8.4.1.2	2-10 8-13
Identification and prioritisation of issues/scoping of impact assessment		
- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account: - relevant NSW government guidelines - industry guidelines - EISs for similar projects - relevant research and reference material - relevant preliminary studies or reports for the proposal - consultation with stakeholders. - Provide a summary of the outcomes of the process including: - all issues identified including local, regional and global impacts (e.g. increased/ decreased greenhouse emissions) - key issues which will require a full analysis (including comprehensive baseline assessment) - issues not needing full analysis though they may be addressed in the mitigation strategy - 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).	7	7-1



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
The Environmental Issues		
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. <i>Note: The level of detail should match the level of importance of the issue in decision making which is dependent on the environmental risk.</i>	8 9	8-1 9-1
1. General - Describe baseline conditions		
Provide a description of existing environmental conditions for any potential impacts.		
1. General - 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.	8 9	8-1 9-1



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
1. General - 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.	8	8-1
	9	9-1



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
2. Air		
2. Air - Describe baseline conditions		
Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data.	Appendix 1	
2. Air - 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. <i>Note: With dust and odour, it may be possible to use data from existing similar activities to generate emission rates.</i> - Reference should be made to: <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (DEC, 2016); <i>Approved Methods for the Sampling and Analysis of Air Pollutants in NSW</i> (DEC, 2007); <i>Assessment and Management of Odour from Stationary Sources in NSW</i> (DEC, 2006); <i>Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW</i> (DEC, 2006); <i>Load Calculation Protocol for use by holders of NSW Environment Protection Licences when calculating Assessable Pollutant Loads</i> (DECC, 2009)	Appendix 1	
2. Air - 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.	Appendix 1	



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
3. Noise and Vibration		
3. Noise and Vibration - <i>Describe baseline conditions</i>		
- Determine the existing background (LA90) and ambient (LAeq) noise levels, as relevant, in accordance with the <i>NSW Noise Policy for Industry</i>. - Determine the existing road traffic noise levels in accordance with the <i>NSW Road Noise Policy</i>, 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 <i>NSW Noise Policy for Industry</i>. 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.	Appendix 2	



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
3. Noise and Vibration - Assess Impacts		
- Determine the project noise trigger levels for the site. For each identified potentially affected receiver, this should include: - determination of the project intrusive noise level for each identified potentially affected receiver - selection and justification of the appropriate amenity category for each identified potentially affected receiver - determination of the project amenity noise level for each receiver - 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 effects on sleep. Determine expected noise level and noise character likely to be generated from noise sources during: - site establishment - construction - operational phases - transport including traffic noise generated by the proposal - other services. <i>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).</i>	Appendix 2	



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
- 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 d) from topography, buildings or barriers, etc e) methods used to predict noise impacts including identification of any noise models used. f) the weather conditions considered for the noise predictions g) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario h) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived i) an assessment of the need to include modification factors as detailed in Fact Sheet C of the <i>NSW Noise Policy for Industry</i>. - 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 <i>Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration</i> (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.		



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
3. Noise and Vibration - <i>Describe management and mitigation measures</i>		
- 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: - use of alternative transportation modes, alternative routes, or other methods of avoiding the new road usage - control of traffic (eg: limiting times of access or speed limitations) - resurfacing of the road using a quiet surface - use of (additional) noise barriers or bunds - treatment of the façade to reduce internal noise levels buildings where the night-time criteria is a major concern - more stringent limits for noise emission from vehicles (i.e. using specially designed ‘quite’ trucks and/or trucks to use air bag suspension - driver education - appropriate truck routes - limit usage of exhaust brakes - use of premium muffles on trucks - reducing speed limits for trucks - ongoing community liaison and monitoring of complaints - phasing in the increased road use.	Appendix 2	



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
4. Water		
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). <i>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).</i> - 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 <i>Guidelines for Fresh and Marine Water Quality</i> (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.	8.3	8-7
	8.3	8-7



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
- 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.	6.3.1	6-5



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
4. Water - Assess impacts		
- No proposal should breach clause 120 of the <i>Protection of the Environment Operations Act 1997</i> (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.	8.3	8-7



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
- 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. <i>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.</i> - 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: <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004), <i>Guidelines for Fresh and Marine Water Quality</i> ANZECC 2000), <i>Environmental Guidelines: Use of effluent by Irrigation</i> (DEC, 2004).		



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
4. Water - 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: - site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition) - minimising runoff - minimising reductions or modifications to flow regimes - avoiding modifications to groundwater. - Describe groundwater impact mitigation measures including: - site selection - retention of native vegetation and revegetation - artificial recharge - providing surface storages with impervious linings - monitoring program. - Describe geomorphological impact mitigation measures including: - site selection - erosion and sediment controls - minimising instream works - treating existing accelerated erosion and deposition - monitoring program. - Any proposed monitoring should be undertaken in accordance with the <i>Approved Methods for the Sampling and Analysis of Water Pollutants in NSW</i> (DEC 2004).	8.3	8-7



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
5. Soils and Contamination		
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.	8.4	8-12
5. Soils and Contamination - Assess impacts		
- Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of: - disturbing any existing contaminated soil - contamination of soil by operation of the activity - subsidence or instability - soil erosion - disturbing acid sulfate or potential acid sulfate soils. - Reference should be made to: <i>Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites</i> (OEH, 2011); <i>Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997</i> (EPA, 2015).	8.4	8-12
5. Soils and Contamination - 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: - erosion and sediment control measures - proposals for site remediation – see <i>Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land</i> (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) - proposals for the management of these soils – see <i>Acid Sulfate Soil Manual</i> (Acid Sulfate Soil Advisory Committee 1998) and <i>Acid Sulfate Soils Assessment Guidelines</i> (Acid Sulfate Soil Advisory Committee 1998).	8.4	8-12



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
6. Waste and Chemicals		
6. Waste and Chemicals - <i>Describe baseline conditions</i>		
Describe any waste or chemical operations related to the proposal.	8.6	8-2
6. Waste and Chemicals – <i>Assess Impacts</i>		
- 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 <i>Waste Classification Guidelines 2014 (as in force from time to time)</i> - 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 <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-21</i>.	8.6	8-2



Table 4-1: DP&E Assessment Requirements and EIS Reference

Environmental Assessment Requirements – Key Issues	EIS Reference	
	Section	Page No
6. Waste and Chemicals – <i>Describe Management and Mitigation Measures</i>		
- 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.	8.6	8-2
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).	10	10-1
List of Approvals and Licences		
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).	14	14-1
Compilation of Mitigation Measures		
- 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.	12	12-1
Justification for the Proposal		
Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.	15	15-1



Table 4-2: Department of Primary Industries Assessment Requirements and EIS Reference

Key Assessment Requirements	EIS Reference	
	Section	Page No.
AGRICULTURE		
Site suitable for development		
Detail that the proposal is consistent with strategic plans and zone requirements	3	3-1
Complete a Landuse Conflict Risk Assessment (LUCRA) to identify potential land use conflict, in particular relating to separation distances and management practices to minimise odour, dust and noise from sensitive receptors. A LUCRA is described in the DPI Land Use Conflict Risk Assessment Guide.	8.4.4	8-14
Include a map to scale showing the above operational and infrastructure details including separation distances from sensitive receptors.	6.5.1	6-16
Consideration for impacts to agricultural resources and land		
- Describe the current and potential <i>Important Agriculture Land</i> on the proposed development site and surrounding locality including the land capability and agricultural productivity. - Demonstrate that all significant impacts on current and potential agricultural developments and resources can be reasonably avoided or adequately mitigated. - Consider possible cumulative effects to agricultural enterprises and landholders. - Detail the expected life span of the proposed development	8.4.3	8-14
Bushfire risk identified and managed		
Risk assessment level and mitigation plan developed to address bush fire risk.	8.7.3.4	8-21
Suitable and secure water supply		
- Estimated water demand and water availability should be clearly outlined in the proposal. The source of water and any sanitisation methods to be detailed in the application. - Outline any impacts to water use from agriculture and mitigation measures if required.	8.3.1.1	8-7
Surface & Groundwater protected		
- Proposed development design, operation and by-product management should be undertaken to avoid nutrient and sediment build up and minimise erosion, off site surface water movement and groundwater accession. - The proposal should detail how design and operation will be undertaken for byproduct management in accordance with best practice to prevent excess build-up of nutrients and salts in the soil profile and increase the risk of leaching. A monitoring program should be developed.	8.3	8-7
Biosecurity Standards met		
- Include a biosecurity (pests, weeds and disease) risk assessment outlining the likely plant, animal and community risks as per guidelines in Attachment 2. - Develop a biosecurity response plan to deal with identified risks as well as contingency plans for any failures. Including monitoring and mitigation measures in weed, disease and pest management plans. - Details of adequate fencing to keep livestock out.	9.5	9-11
Suitable traffic movements		
Consideration of the route for movements needs to be taken into account so that impacts on sensitive receptors are minimised (eg noise, dust, volume of traffic). This should include consideration of Travelling Stock Reserves¹ (TSR) and the movement of livestock or farm vehicles along / across the affected roads.	9.4	9-6
Visual amenity achieved		
Amenity impacts are assessed and any necessary response to mitigate visual impacts is described and illustrated.	9.2	9-3
Land stewardship met		
- Develop Rehabilitation and Decommissioning/Closure Management Plans that outlines the rehabilitation objectives and strategies. This includes, but is not limited to, describing the design criteria of the final landuse and landform, indicators to be used to guide the return of the land back to agricultural production, along with the expected timeline for the rehabilitation program. - Outline monitoring and mitigation measures to be adopted for rehabilitation remedial actions.	5.11	5-8
Adequate consultation with community		
- Consult with relevant agencies such as on the design, construction and operation of the proposed infrastructure. - Consult with the owners / managers of affected and adjoining neighbours and agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation. - Establish a complaints register that includes reporting and investigating procedures and timelines, and liaison with Council in relation to complaint issues.	4	4-1



Table 4-2: Department of Primary Industries Assessment Requirements and EIS Reference

Key Assessment Requirements	EIS Reference	
	Section	Page No.
Contingency and Environmental Management Plan development		
Contingency plans should be developed to enable the operation to deal with emergency situations. Commitment to the preparation of an Emergency Management plan that outlines procedures and responsibilities for responding to bushfire threats and possible mass mortality events which might result from extreme climatic conditions, routine or emergency animal disease outbreaks.	12.2	12-3
FISHERIES		
DPI Fisheries requests more detailed information on the extent of the proposed development a whether it falls within the mapped area of coastal wetland or the mapped proximity area for the coastal wetland.	3.2.4.8	3-13
The environmental assessment should consider potential flow on effects from site establishment and operational activities, including:		
the use of pesticides and fertilisers on the orchard,	5.7	5-4
dust from waste recovery operations and trucks on unsealed roads,	9.4.2	9-8
runoff and leaching of contaminants and chemicals from the site, particularly in relation to the adjacent coastal wetland.	8.3	8-7
Information requirements that may be of assistance in the preparation of an environmental assessment for this proposal are listed in Attachment 1. (Refer to SEARS in Attachment 1 of this EIS.)		

Table 4-3: NSW Rural Fire Service Assessment Requirements and EIS Reference

Key Assessment Requirements	EIS Reference	
	Section	Page No
There is no objection to the proposed Designated Development.		
A bush fire report shall be prepared by a suitably qualified person, as part of the preparation of an Environmental Impact Statement. The report should consider the aims and objectives of Planning for Bush Fire Protection, including emergency and evacuation planning, and provide recommendations that achieve a better bush fire outcome for the existing development.	Appendix 7	



Table 4-4: Roads and Maritime Services Assessment Requirements and EIS Reference

Key Assessment Requirements	EIS Reference	
	Section	Page No
Roads and Maritime requires the following issues to be included in the transport and traffic impact assessment of the proposed development: 1. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). The following key intersection is to be examined/modelled for performance and compliance with AUSTROADS Guide to Road Design Part 4A: Unsignalised and signalised intersections: • Sackville Road/Stannix Park Road SIDRA modelling and swept path plans for the intersection should be submitted to Roads and Maritime for review. 2. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle width, etc). 3. Proposed number of car parking spaces and compliance with the appropriate parking codes. 4. Details of light and heavy vehicle movements (including vehicle type and likely arrival and departure times)	Appendix 5	



5. DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development is for the establishment and operation of a landscaping supply business and resource recovery facility. The development would be confined to an area of approximately 2 hectares within the site and would require cut and fill works to achieve required levels for construction of a large warehouse building and associated infrastructure.

5.1 PROPOSED SITE ACTIVITIES AND SITE USE

The site is proposed to house a landscaping supply business and a resource recovery facility for the processing of virgin excavated natural materials (VENM), excavated natural materials (ENM), concrete, bricks and greenwaste (mulch). Up to 20,000 tonnes of this material would be processed annually.

The facility would be located within the centre portion of the site, the majority of which is currently cleared vacant land. A tenant is using the northern area of the site as an equestrian centre and the southern area of the site is currently vegetated. These existing land uses would remain unaltered.

One new building with adjoining offices would be constructed for the purposes of the proposed development with frontage to Sargents Road. This would be used for the storage and processing of materials. A weighbridge and washbay would be installed and a new car parking area and driveway areas would be established. The area to the south east of the new building would be used for stockpiling of finished goods on a compacted roadbase surface. These stockpiled materials will be stored within external storage bays.

The VENM and ENM will mostly be sourced from excavations on sites where Hala Constructions operate, but will also be sourced from other sites needing removal of VENM. Trucks would unload the VENM into designated bays within the new processing building. Crushing and screening of VENM is proposed to occur inside the processing building on site. The VENM would be processed into quality topsoil for resale. The topsoil would be stockpiled in designated bays in the external area to the rear of the building. Three (3) bays are expected to be required for topsoil.

Concrete and brick products would also be sourced from sites where Hala Constructions operate. Skip bins of this material would be unloaded within the processing building and the material would be crushed and screening into aggregates for resale. Empty skip bins would be stored in the external area behind the new processing building. Aggregate material would be stockpiled in bays in the external area to the rear of the building. Three (3) bays are expected to be required for aggregates.

Some greenwaste (trees) would be brought onto site from time to time. This material would be mulched within the processing building. Mulch would then be stockpiled in bays in the external area to the rear of the building. Two (2) bays are expected to be required for mulch.



5.2 SITE LAYOUT PLANS

A set of plans for the proposed development are provided in Appendix 9. These include:

- Site Plan (Baini Design);
- Ground Floor Plan (Baini Design);
- Building elevations (Baini Design);
- Sedimentation Plan – Erosion and Sediment Control Plan (Baini Design);
- Colour and Materials Schedule (Baini Design);
- Civil Engineering Drawing Set (Indesco Consult Australia);
- Landscape Plan (JALA Designs);
- Stormwater Concept Plan (Australian Consulting Engineers); and
- Survey Plan (C&A Surveyors NSW P/L).

5.3 CONSTRUCTION WORKS

Construction works would involve erection of a new building with adjoining offices, a car parking area, driveways, a weighbridge, wash bay and compacted hardstand area for external stockpile bay areas and storage of empty skip bins.

The processing building will be a standard Colorbond shed with concrete slab and have a floor area of 2,041 square metres. There would be four 6 m x 6 m roller shutter doors providing entry and exit access for trucks to arrive and unload inside the building and then leave through the back end. The building would be 12.8 m in height to the peak of the roof.

The adjoining office building would have a floor area of 131 m² and contain two offices, amenities with showers, a kitchen/lunchroom area, a boardroom and reception area.

The following sequences of activities are anticipated during the construction works:

1. Site establishment – installing temporary fencing, signage, waste skip bins, erosion and sediment controls.
2. Relocation or protection of services – relocating and protecting electricity, gas and telecommunications infrastructure affected by the project if required.
3. Site preparation – demolish existing infrastructure that is to be replaced, removal and protection of existing trees.
4. Earthworks – undertaking cut and fill works to establish required levels and minor excavations to establish footings and foundations for the new buildings and formwork for car parking area and driveways.
5. Structures – construction of new building and washbay, installation of weighbridge, rainwater tanks and construction of storage bay walls.
6. Pavements – Establishing sealed car parking area and driveways.
7. Commissioning – removal of temporary construction fencing and facilities, waste removal/recycling and commissioning of new infrastructure.
8. Landscaping.

Construction would take place in one stage and be undertaken within the hours of 7.00am–6.00pm Monday to Friday and 8.00am–4.00pm Saturday.

A temporary building would be used for amenities and offices during construction.



It is anticipated the timing for the construction works would be 4 to 6 months.

5.4 PRODUCTION PROCESS

The processes involved in the site operations are as follows:

- Trucks drive to the proposal site with virgin excavated natural materials (VENM), concrete, bricks and greenwaste from sites, entering the property from Sargents Road.
- Trucks arrive on site.
- Trucks enter the processing building and deposit materials in the designated storage bays.
- If required trucks are washed in the designated washbay at the side of the building prior to leaving the site.
- Concrete and bricks are crushed, screened and separated. An excavator loads the crusher with materials which has an electric conveyor to transfer crushed materials to the screen where they are separated into different sizes.
- Sorted materials are moved to designated storage bays by a front-end loader where they are stored.
- Greenwaste is collected from internal storage bays with the excavator and loaded into the mulcher. Mulched material is then moved to external designated storage bays by the front-end loader.
- Products are then transported from site by truck.

5.5 RESOURCES AND FINISHED GOODS

Raw materials to be brought onto site include:

- Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) sourced from the material excavated at construction sites;
- Concrete and bricks; and
- Greenwaste – such as trees, shrubs and garden prunings. Food waste, treated or painted timber and household waste will NOT be accepted.

Finished goods will include:

- Topsoil;
- Aggregate; and
- Mulch.



5.6 EQUIPMENT

Equipment required for the operation of the facility includes:

- 1 x Diesel crusher and screen with electric conveyor;
- 1 x Mulcher;
- 1 x excavator;
- 1 x front end loader; and
- 1 x forklift.

5.7 CHEMICALS

The site will store minor quantities of LPG, diesel and truck wash.

No pesticides or fertilisers would be required for the operation of the facility and would not be stored or used at the site.

5.8 OPERATIONAL DETAILS

5.8.1 Utility Connections

5.8.1.1 Water

Rainwater tanks would be installed to capture roof water from the new buildings and plumbed into the office building for use in the amenities. Rainwater would also be used in the washbay and for dust suppression purposes. If required, these tanks can be replenished with purchased water.

5.8.1.2 Sewage and Wastewater

A domestic wastewater treatment system (septic tank) would be installed for amenities in the office building. A greywater treatment system is recommended to be installed in the office building to reuse greywater for toilet flushing.

The washbay would be a closed loop system that would contain a water filtration system that would remove oil, grease, detergent and suspended solids from washdown water suitable for recycling back into the system.

Dust suppression would consist of water sprayers that release a fine mist adequate to dampen stockpiles without creating wastewater.

Therefore, no wastewater would be generated and a tradewaste agreement is not required.

5.8.1.3 Electricity

The site is connected to the electricity network.



5.8.1.4 Telecommunications

Service to be provided by local network.

5.8.1.5 Gas, Petrol and Diesel

A 3,000L diesel self bunded tank would be provided on site for use in the mobile equipment on site.

5.8.2 Hours of Operation

The facility is proposed to operate from Monday to Friday 7am to 6pm and Saturday from 8am to 4pm. The site is not proposed to operate on Sundays or Public Holidays.

5.8.3 Employment

The operation will employ three full-time employees

5.8.4 Traffic

Material would be transported in trucks with an average size of 23 to 48 tonnes. Based on the annual tonnage of 20,000 tonnes per year and operation of the site 6 days per week, the average weekly truck movements would be between 16 to 34. This equates to an average of less than 3 trucks in and 3 trucks out per day.

A traffic impact assessment was undertaken by ML Traffic Engineers (Appendix 5) and is summarised in Section 9.4.1 of the EIS. The traffic report concluded that the facility would be a modest traffic generator and the existing nearby intersections and road network will be able to accommodate the proposed development.

5.8.5 Parking

Twenty seven (27) car parking spaces are to be provided including 26 general spaces and one disabled space. The car park would be accessed via a driveway off Sargents Road. The layout of the car park is shown on the site plans.

Car parking is assessed in accordance with the Hawkesbury DCP and RMS requirements in Section 9.3, in the Traffic and Parking Assessment and the Car Park and Driveway Certification prepared by ML Traffic Engineers presented in Appendix 5.

5.8.6 Site Security

The site would be fenced using chain link fence or similar to keep out livestock and for security purposes.

5.9 EMISSIONS AND WASTE

An outline of the potential emissions and wastes resulting from the proposed development is provided in the following sub-sections. Detailed assessments are provided in Section 8 of the EIS.



5.9.1 Air and Odour

Air emissions would consist of fugitive emissions of dust and particulates from wind erosion of stockpiles and loading and unloading of materials inside the processing building. Due to the nature of the incoming materials, odour is unlikely to be generated.

Transport of materials would be within covered trucks. All processing activities would be undertaken within an enclosed building. This would significantly reduce the potential for release of dust and particulates. Windblown dust from external stockpiles would be controlled using water sprayers that would provide a fine mist over the areas during loading/unloading and high winds.

An Air Quality Impact Assessment has been undertaken and is provided in Appendix 1.

5.9.2 Noise and Vibration

On a typical operational day, noise will come from the following sources:

- Front End Loader;
- Excavator;
- Truck;
- Crusher; and
- Screener.

The crusher and screener will be inside an enclosed building and the site activities will be limited to the day period. The eastern most roller shutter door needs to be closed while the crusher is in operation. Mobile equipment is recommended to be fitted with reversing lights or a white noise reversing alarm.

During operations, noise levels are predicted to comply with the Noise Policy for Industry criteria at all receivers during all scenarios.

It is therefore concluded that the proposed site activities will not have a detrimental impact on the neighbouring receivers, if the noise control measures are carried out.

Construction activities involve the use of the following noise creating equipment, a:

- Dozer;
- Backhoe;
- Truck;
- Hand Tools;
- Concrete Mixer Truck;
- Concrete Pump; and
- Crane.

The noise modelling results associated with the construction activities show compliance at all receivers at each stage of construction.

Construction activities are recommended to be limited to standard hours in accordance with the Interim Construction Noise Guideline.



A maximum of 2 truck movements per hour a day between 7am and 5pm and no truck movements during the night period was considered for the road traffic noise assessment. Vehicles are assumed to travel along Sargents Road at 60 km/h. For the residential dwellings that front onto Sargents Road, the predicted noise levels associated with the vehicle movements from the site would be below the daytime criteria.

5.9.3 Water and Wastewater

Water would not be required for the processing operations. Water would be used in a wash bay which would be a recirculating system that would be cleaned out periodically by a licensed waste contractor. The washbay would contain a water filtration system that would remove oil, grease, detergent and suspended solids from washdown water and treated water would be reused in the system.

Dust suppression would consist of water sprayers that release a fine mist adequate to dampen stockpiles without creating wastewater.

No wastewater would be generated from the processing or ancillary operations and a tradewaste agreement is not required.

There is potential for surface water runoff to be contaminated with sediment from external stockpiles. This would be controlled with erosion and sediment controls. An erosion and sediment control plan would be implemented and is provided in Appendix 9 of this EIS.

5.9.4 Waste

Waste generated would be limited to office and amenities waste. There is little potential for waste to be generated from processing operations as materials are brought in on trucks in bulk and leave in bulk. All material brought onto site is intended to be reused off site after processing. No packaging materials are required.

5.10 CLEANER PRODUCTION ACTIONS

Cleaner production is a preventative approach to managing the environmental impacts of a facility. The following cleaner production actions to be implemented at the site are outlined below:

5.10.1 Measures to minimise waste

The proposed facility would bring in waste from construction sites with the intention to process this material for reuse off-site. To minimise waste being generated by this, there would be a strict incoming material procedure that would ensure no materials are brought onto site are limited to VENM, ENM, concrete and bricks, and greenwaste. 100% of the materials brought onto site are able to be recycled. This would eliminate the generation of waste from the processing operations at the site.

Minor waste would be generated from the office and amenities areas. Recycling bins for office paper and cardboard would be provided and employees would be encouraged to recycle printer cartridges and other office items.



5.10.2 Proposals for use or recycling of by-products

No by-products would be generated. All material processed will be reused off site.

5.10.3 Proposed disposal methods for solid and liquid waste

Little to no waste would be generated. The wash bay system implemented would be a recirculating system that would generate no wastewater. Possible periodic clean outs may be required and any wastewater or sludge would be removed by a licensed waste contractor.

5.10.4 Air management systems

Windblown dust and particulates would be generated from the stockpiles located external to the building. Rainwater tanks installed to capture building roof water would provide water for dust suppression. A sprinkler system would be installed for dust suppression purposes and be manually controlled to provide water sprays as a fine mist over stockpiled materials during loading and unloading or high winds.

5.10.5 Water Management System

The potential sources of water pollution are sediment from the material stockpiles and potential spills or leaks from the storage of diesel, as well as any chemicals used in the wash bay.

Sediment and erosion controls would be put in place to minimise the potential for sediment laden stormwater to be discharged to waterways.

Adequate controls would be implemented to minimise the potential for diesel spills and leaks.

5.10.6 Soil contamination prevention

The inert nature of the proposed incoming materials have little potential to contaminate soil. The highest risk would be from the concrete and bricks, and from the storage of diesel. Processing of all materials would be undertaken within an enclosed building. The stockpiles of finished goods would be located on a compacted roadbase hardstand area. The incoming material procedure would prevent any potentially contaminating material to be brought onto the site.

The diesel tank would be self bunded and re-fuelling would take place. A spill kit would be provided in close proximity to the tank.

5.11 SITE REHABILITATION

This section outlines the approach that would be taken to site remediation and closure of the facility including the rehabilitation objectives and strategies and proposed plans for the final condition of the site. The final site condition would ensure the site's suitability for future uses.

5.11.1 Rehabilitation Objectives

Rehabilitation objectives for the site would depend on the proposed future use. If the future use requires the land to be restored to its condition pre-development, the objectives would include:



- Restore the land to pre-development condition;
- Allow for sustainable future land uses to occur;
- Establish a clear set of performance indicators to be met;
- Improve linkages between any existing areas of remnant vegetation; and
- Re-establish pastoral grasslands.

5.11.2 Rehabilitation Strategies

Strategies applied depend on the proposed future use of the site.

Rehabilitation activities for future agricultural land use would include the following:

- Decommissioning of all surface infrastructure and removal from site if these are not required for proposed future use. These areas would be revegetated with pastoral grasslands.
- Growing media development in areas where revegetation is proposed would be undertaken.
- Establishment of pastoral grasslands – native grass species typical of the local area would be used.

Monitoring of rehabilitated areas would need to be ongoing and remedial maintenance undertaken as required.

5.11.3 Final Land Use and Landform

The land would require minor levelling for the establishment of the proposed infrastructure. This would not significantly impact on the final landform and once the removal of infrastructure has been completed, revegetation and establishment of native grass species could be undertaken. In this way, the land would be able to be used for future agricultural uses.

Preparation of a formal Rehabilitation Plan should be considered prior to closure of the business or sale of the land for alternate uses.



6. EXISTING ENVIRONMENT

6.1 GEOLOGY AND SOILS

6.1.1 Geological and Soil Landscapes

The 'Penrith 1:100,000 Geological Map Sheet 9030' describes the geological composition of the area as follows:

'Qph: clay, clayey sand, silt.'

The soil map 'Soil Landscape of Penrith 1:100,000 Sheet 9030' shows that the subject site is located in an area classified as 'Woodlands', which is described as follows:

'Landscape – very broad benches and drainage lines in the passage beds of the Mittagong Formation (alternating bands of shale and fine-grained sandstones). Rock outcrop is minimal. Local relief up to 20 m. Slope <10%.

Soils – deep (150-300 cm) soils range from leached sands (Uc2.21) in the drainage lines to Lithosols (Uc1) on sideslopes, with Red Solodic Soils (Dr4.62), Xanthozems (Gn3.51) and Yellow Earths (Gn2.24) on benches.

Limitations – stony soil, low soil fertility, low available water holding capacity.'

6.1.2 Acid Sulfate Soils

A search of the CSIRO Atlas of Australian Acid Sulfate Soils database shows this site is located over an area having a high probability/unknown confidence level and low probability/low confidence level of Acid Sulfate Soil (ASS) occurrence. The map in Figure 6-1 illustrates these findings.

Hawkesbury Council has undertaken further ASS mapping as part of the Hawkesbury Residential Land Strategy 2010 (Hawkesbury Council, 2010). Under this plan, the subject site is located on 'Class 3' and 'Class 5' land. Therefore, development consent is required for:

Class 3

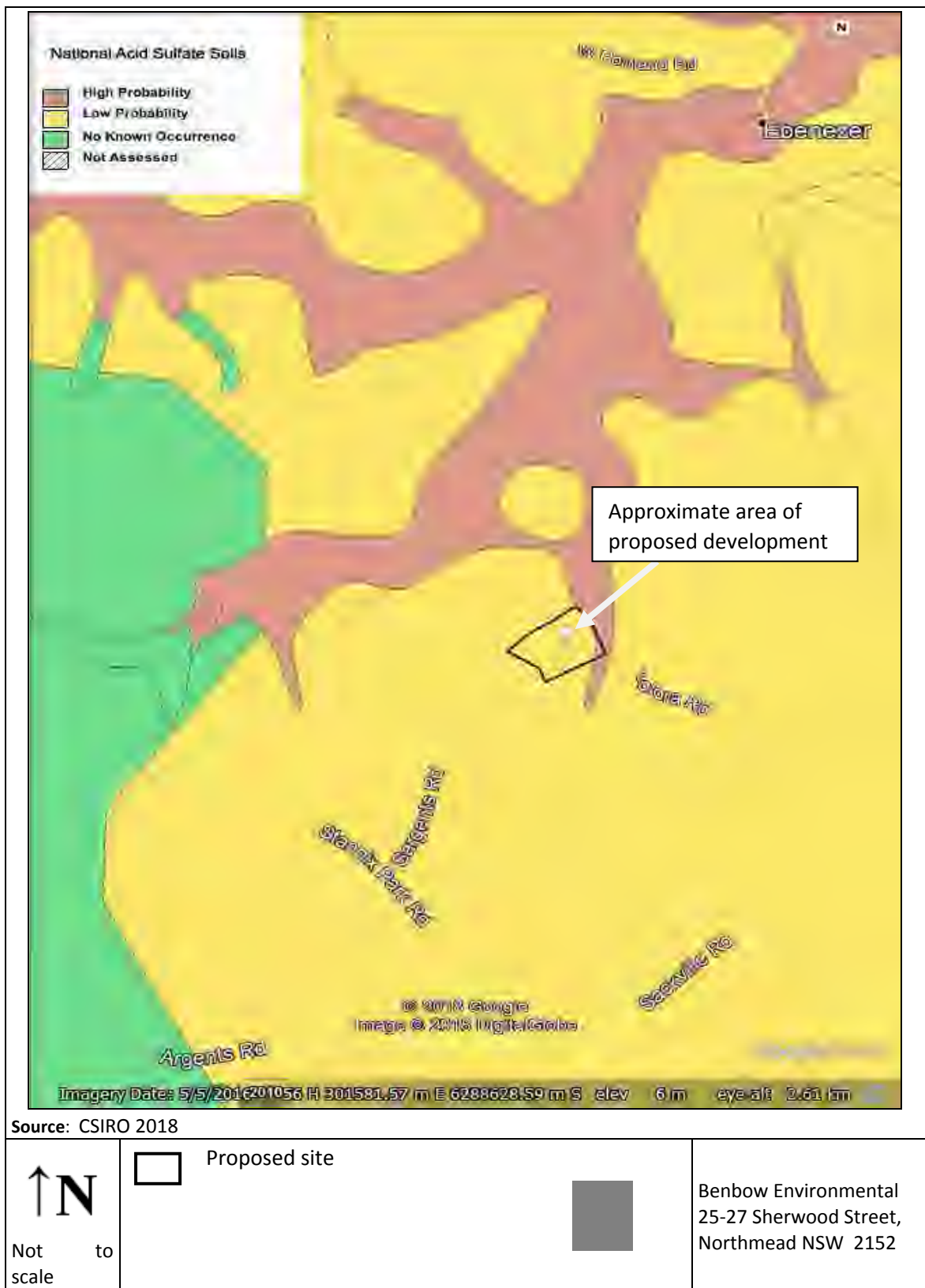
*Works by which the watertable is likely to be lowered; and
Works beyond 1 metre below the natural ground surface.*

Class 5

*Works by which the watertable is likely to be lowered beyond 2 metres below natural ground surface; and
Works within 500 metres of adjacent Class 1, 2, 3 or 4 land which are likely to lower the watertable below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land*

Given that this proposal involves cut and fill works and the construction of buildings requiring footings where ASS may potentially be disturbed, an assessment is required to determine whether in fact ASS does occur on site.

Figure 6-1: Acid Sulfate Soil Map





Acid Sulfate Soils are naturally occurring soils and sediments that formed under waterlogged conditions. They contain iron sulfide (predominantly pyrite), when water logged, or in an anoxic environment, ASS remain benign. However, if drained, excavated or exposed to air by a lowering of the water table, the sulphides react with oxygen to form sulfuric acid, sometimes in large quantities (for every tonne of sulfidic material that completely oxidises, 1.6 tonnes of pure sulfuric acid is produced). ASS contains traces of metals such as iron, aluminium and arsenic. Once acid forms, it mobilises any metals held within the soil. Rainfall washes this mixture into the surrounding environment, polluting land and nearby waterways. Accumulation of acid and metals becomes toxic to plants and animals, especially aquatic organisms. Built structures are highly susceptible to ASS, as acid will slowly destroy concrete, steel, roads and building foundations.

Where possible, disturbing ASS should be avoided. If disturbed, ASS must be effectively treated before any construction work can begin. Designs that limit the volume of soil needed to be removed or disturbed should be chosen. Good management practises include:

- Choosing construction methods and site management plans that prevent exposed ASS, being left without proper treatment.
- The placing of built structures over land where ASS is buried the deepest, so only the least amount of ASS is needed to be removed.
- Designing broad and shallow drainage systems to prevent the need to dig into buried ASS layers, but is still effective at removing excess surface water.

An acid sulfate soil assessment was undertaken and results presented in Appendix 4.

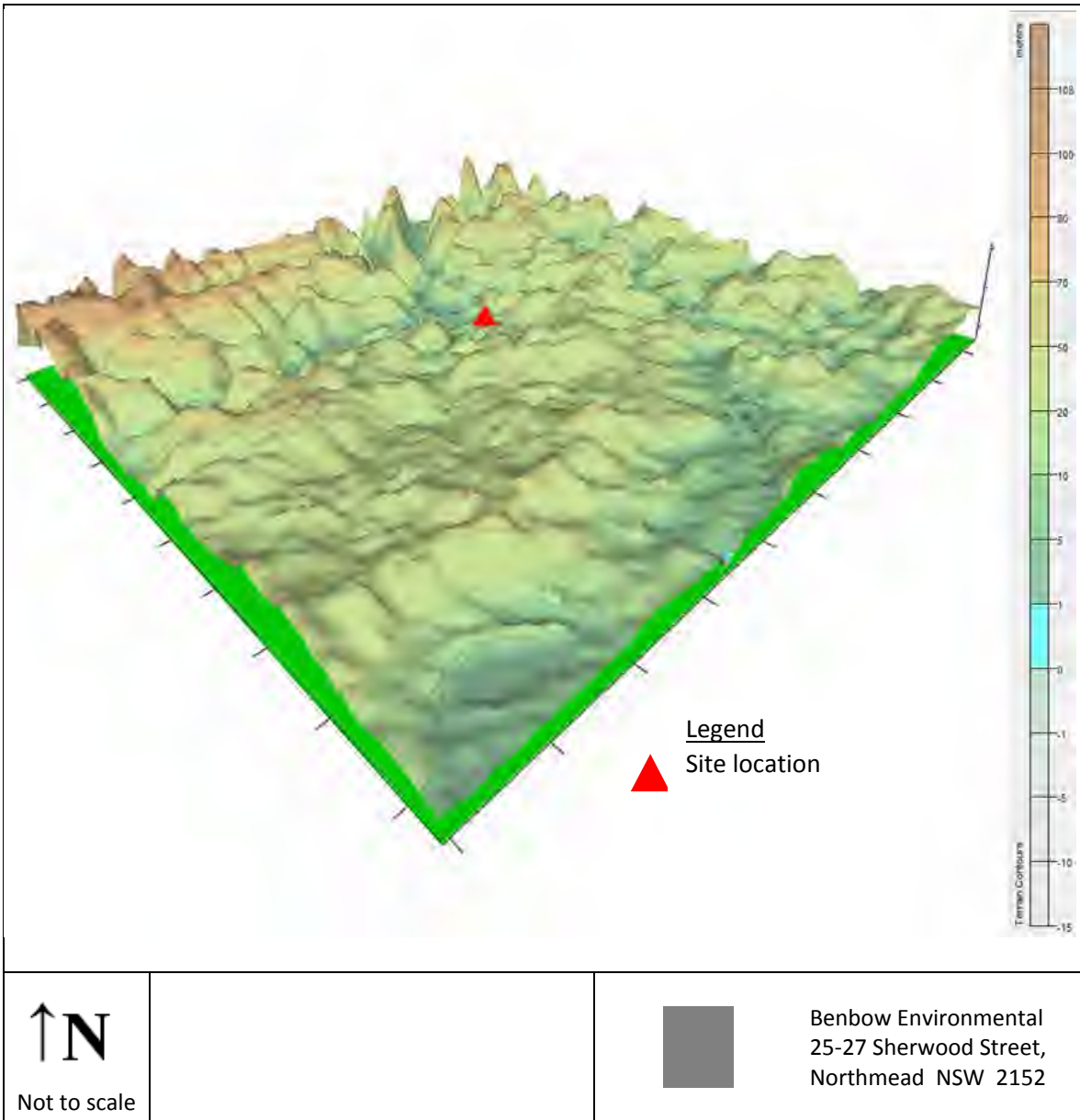
6.2 TOPOGRAPHY

The terrain slopes gently by approximately 10 m, from 30 to 20 m towards the north-eastern corner.

A three-dimensional view of the local topography surrounding the site has been provided in Figure 6-2, with the terrain/vertical axis exaggerated by a factor of 10. It should be noted that this figure approximates the actual terrain, based on information that has been digitised from local contour maps.



Figure 6-2: Local Topography with Vertical Exaggeration of 10





6.3 HYDROLOGY

The following section details the hydrological aspect of the site and surrounding region. Specifics on surface water, waterways and groundwater have been described, together with overall catchment issues such as salinity and flooding.

6.3.1 Waterways and Catchment

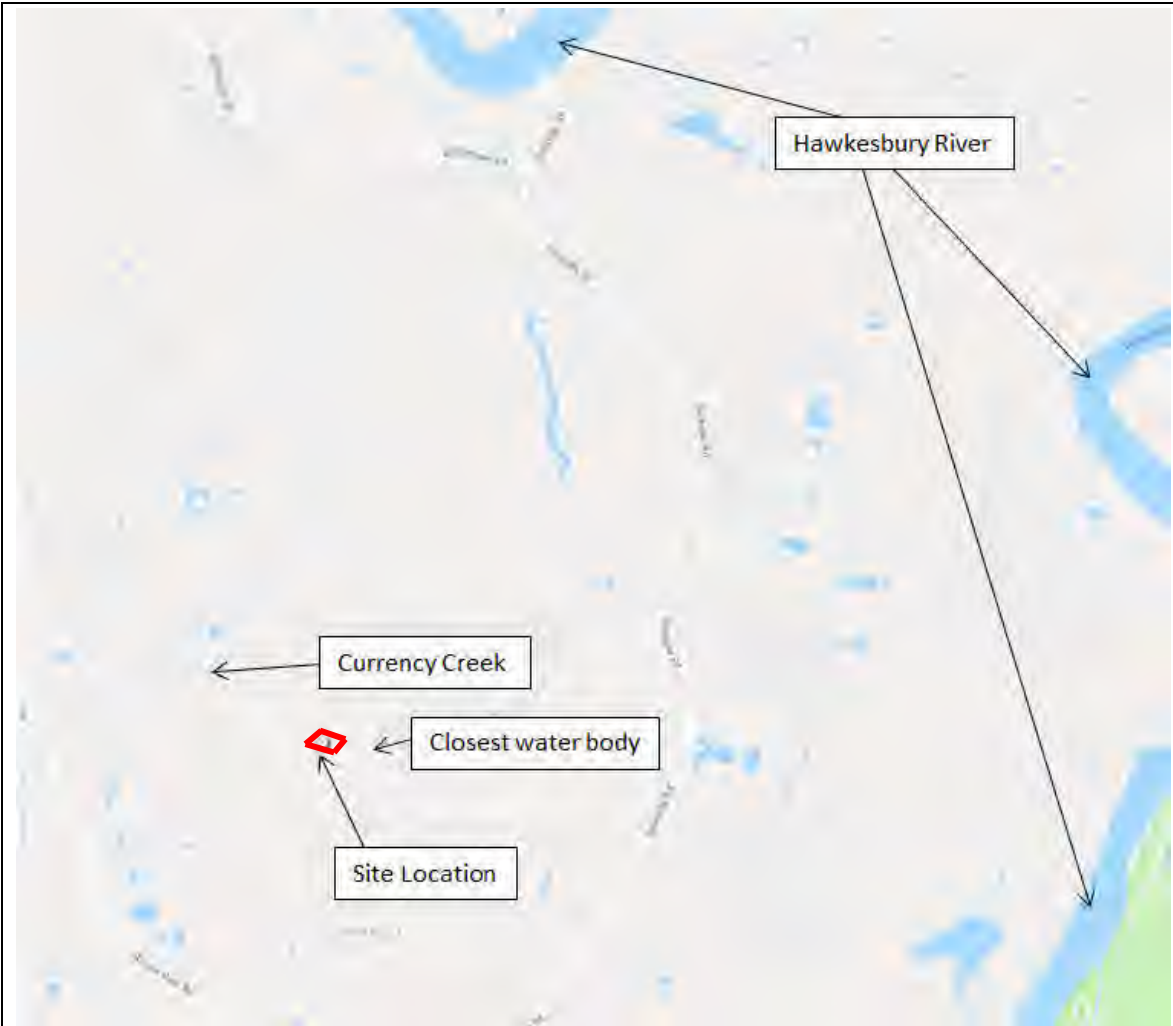
The only waterbody onsite is the 1,500 m² dam situated to the north-east, with the nearest offsite water body being a small pond located approximately 100 m east of the site's eastern boundary. Bordering the site, spanning a 140° arc, NWW to NE, is a large area of coastal wetlands (marked on the Hawkesbury Local Environmental Plan 2012). This is fed by Currency Creek, some 550 m north-west of the site, which in turn is fed by a north westerly flowing, chain-of-ponds tributary, situated approximately 740 m south west of the site. Currency Creek flows north into the Hawkesbury River.

Situated 3,140 m east of the site, within Cattai National Park, is a north flowing reach of the Hawkesbury River. The river heads westwards with its closest point approximately 2,630 m from the site's northern border, before the river turns north-eastwards.

The Hawkesbury-Nepean River flows a total of 470 km, originating from south of Goulburn, NSW, to its mouth at Broken Bay, some 15 km inland from the coast. Its catchment stretches 21,400 km². The Upper Hawkesbury River flows from Yarramundi, south of Penrith, where its tidal limit is reached and where the Nepean "ends", at the confluence with the Grose River. In the area between Windsor to Sackville, the river is wide and deep, with low flat banks and is cleared of most riparian vegetation. Here, the wide flat floodplains have been cultivated and are very susceptible to flooding. The Hawkesbury-Nepean Valley is very prone to rapid and deep flood events, with five major tributaries feeding the Hawkesbury-Nepean River system. Narrow sandstone gorges, between Sackville and Brooklyn, cause the river to build to very high levels, with wide-spread flooding and damage occurring as a result (see Section 6.3.3 for flood management).



Figure 6-3: Nearest Waterway

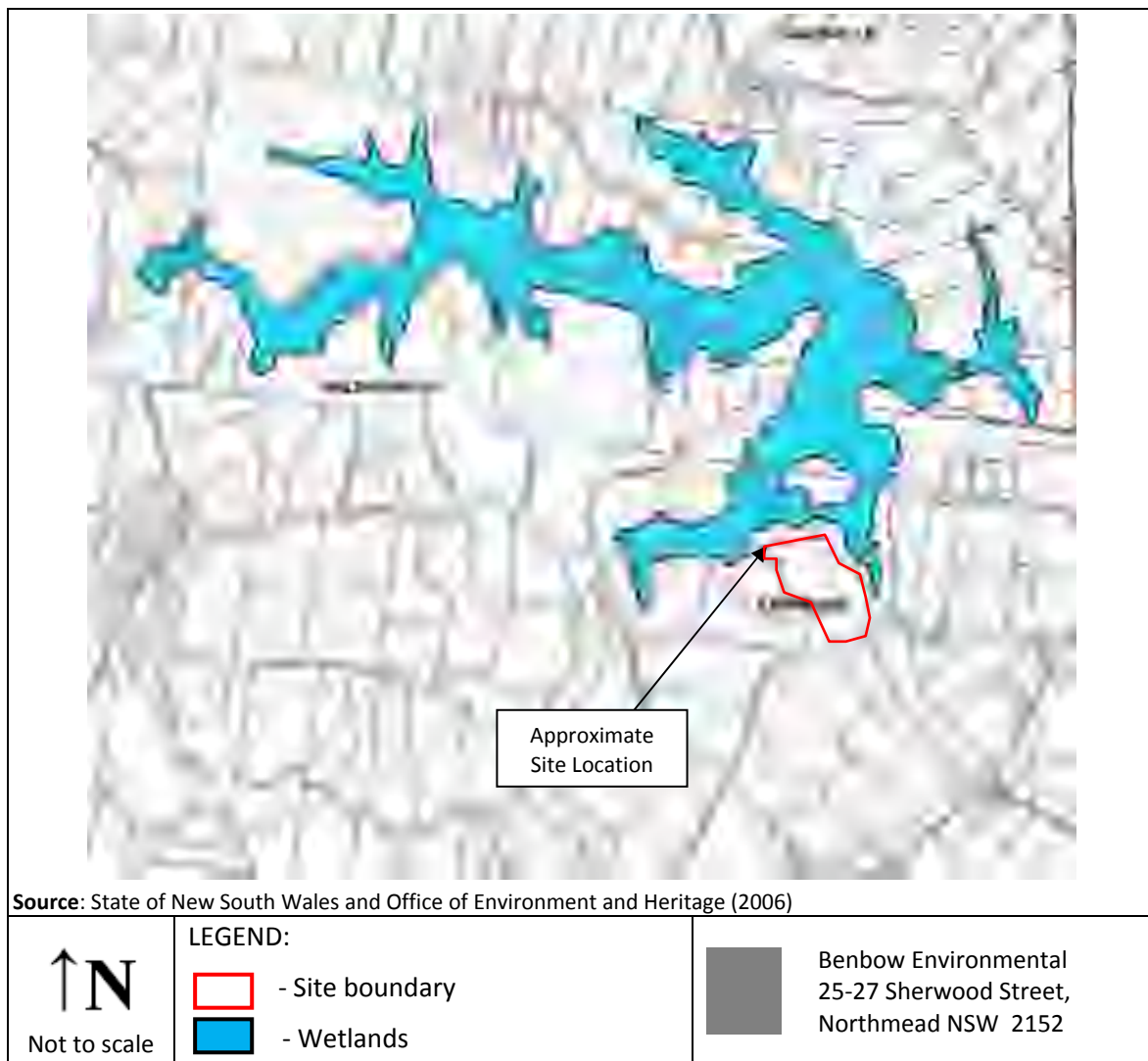


Source: Google Maps 2017

 Not to scale	LEGEND:  - Site Boundary	 Benbow Environmental 25-27 Sherwood Street, Northmead NSW 2152



Figure 6-4: Wetlands Map



6.3.1.1 Water Quality and River Flow Objectives

Water Quality Objectives (WQOs) and the River Flow Objectives (RFOs) identify the agreed environmental values and long-term goals for NSW's surface waters. Unfortunately, the NSW Water Quality Objectives website does not provide objectives for the Hawkesbury-Nepean catchment area. Public enquiries for this and other three catchments have been completed or substantially completed by the Healthy Rivers Commission (HRC).

The HRC was discontinued in 2004 and was replaced by the Natural Resources Commission (NRC). Outstanding Healthy River Commission recommendations have been incorporated by the NRC into Catchment Action Plans and Government programs. The Hawkesbury-Nepean Catchment Action Plan is discussed in the following section.

6.3.1.2 Catchment Management Plan

The Hawkesbury-Nepean Catchment Action Plan 2013-2023 is a ten year plan to guide the management of water, land and vegetation by the community and government.



The Hawkesbury-Nepean and Sydney Metropolitan CMA regions were amalgamated in late 2012 to create the current HNCMA region. The new region encompasses 24,470 square kilometres of varied landscapes including farmland, highly urbanised areas, rivers, estuaries, wetlands and coastline, pristine native vegetation, sandstone escarpments and gorges. The HNCMA's vision for the region has been created through consultation with partners and the community: *Working together to achieve productive, biodiverse, resilient landscapes and liveable urban areas*. The CAP supports this vision through five goals: productivity, biodiversity, community, urban liveability and landscape resilience. A summary of the CAP strategy priorities and CAP actions is in Table 6-1 below.

Table 6-1: CAP Goals and Strategies

	Community	Productivity	Biodiversity	Urban Liveability	Resilient Landscapes
Goals	Communities that relate to and care for their landscapes in many ways.	A region that supports productive enterprises that use natural assets sustainably.	A region that has diverse and abundant native wildlife.	Cities and towns that are more liveable due to protection, integration and enhancement of local ecosystem services.	A region that has communities and landscapes that can adapt and respond to change.
Strategies	C1: Support Aboriginal people to manage projects across culturally significant landscapes and values.	P1: Assist farmers and fishers to apply sustainable production practices.	B1: Maintain the diversity and health of natural systems.	UL1: Empower communities to understand and value ecosystem services and actively manage natural resources.	RL1: Integrate actions to achieve multiple outcomes. Build on previous investments for resilient outcomes.
	C2: Employ and/or support the skills of Aboriginal people to work with natural systems.	P2: Encourage the growth of enterprises which maintain environmental values.	B2: Maintain viable populations of native species, especially those found only in our region (endemic) and those under threat.	UL2: Create a more liveable and water sensitive city by implementing Water Sensitive Urban Design (WSUD)	RL2: Act to reduce the risks to highly vulnerable landscapes from climate changes.
	C3: Support people to work together to maintain and improve environments that are significant to them.	P3: Understand and maintain the flow of ecosystem services.	B3: Make connections across the landscape including the aquatic ecosystem.	UL3: Promote actions which support urban resilience through mitigation and adaptation to impacts of climate changes.	RL3: Apply best practice governance and business management. Continued improvement using the Standard for Quality NRM.



Table 6-1: CAP Goals and Strategies

	Community	Productivity	Biodiversity	Urban Liveability	Resilient Landscapes
	C4: Support groups with limited resources to allow them to manage their local environment.	P4: Support landholders in initiating projects that harness the value of ecosystem services.	B4: Reduce the risk of decline or extinction of native species.	UL4: Improve aquatic and terrestrial habitat condition, connectivity and recreational value in urban areas.	RL4: Develop appropriate evidence bases to support decision making.
	C5: Promote appreciation of natural environments for people from diverse cultural backgrounds.	P5: Restore ecosystem function to degraded areas.		UL5: Enhance and protect Sydney's natural places to support a liveable city.	RL5: Monitor outcomes and risks to support adaptive management.
	C6: In areas of high population, enhance, maintain and provide access to local places with scenic and natural qualities.	P6: Maintain sustainable agriculture in proximity to the Sydney market on fertile soils with access to water.		UL6: Use demonstration sites to show best practice and influence future actions.	RL6: Adapt to change through understanding changes in people and landscapes.



6.3.2 Groundwater

According to the groundwater map by the NSW Department of Primary Industries – Office of Water, there are three groundwater bores within 500m of the subject site. Available data for these bores is presented in Table 6-2.

Table 6-2: Available Data for Groundwater Bores within 500 m of the subject site.

Bore	Depth (m)	Standing Water Level (m)	Salinity
GW105911.1.1	122	-	true
GW059293.1.1	1.8	-	false
GW109944.1.1	120	-	true

Note: ‘ - ’ indicates no data available

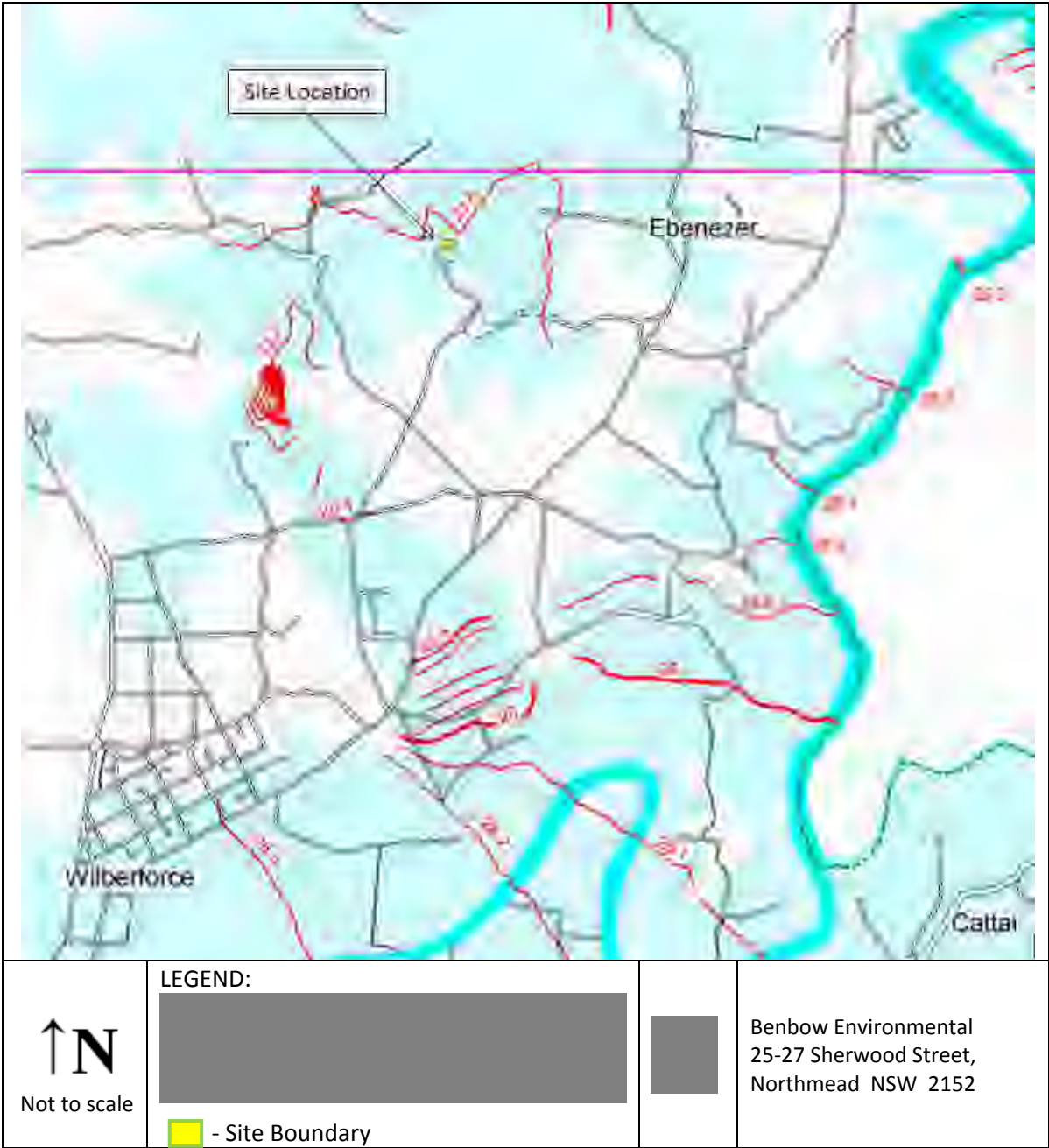
There is no evidence to suggest groundwater contamination exists due to past practises. The site has no history of underground tank installation.

6.3.3 Flooding

Council holds a number of flood studies and investigations that provide documentation of the process by which the various floodplains in the region have been determined. Floodplain Risk Management Plans have also been adopted by Council in order to protect residents from major flood damages. In 2012 Hawkesbury Council adopted the Hawkesbury Floodplain Risk Management Study and Plan.



Figure 6-5: Probable Maximum Flood Hazard Extent



6.4 FLORA AND FAUNA

The site consists mostly of cleared rural land and is used for rural purposes. The proposed development area is cleared with a scattering of established trees existing in the area. No threatened or endangered species or populations inhabit the site.

A targeted search was undertaken using data from the BioNet Atlas of NSW Wildlife website to identify any threatened species in the area surrounding the proposed development. The search criteria included all valid records, from the past five years, of entities threatened in NSW (listed under the *Threatened Species Conservation Act 1995*) and entities threatened nationally (listed under the *Environment Protection and Biodiversity Conservation Act 1999*) within a selected area. The proposed development is located in the middle of the selected area, a 10 km × 10 km extent



with the following coordinates: North -33.48, West 150.82, East 150.92, South -33.58. The results from the search are listed in Table 6-3, and presented in their geographical context in Figure 6-6.

The targeted search shows that there are three (3) threatened species sighted within close proximity to the subject site. The sensitivity class 3 vulnerable, protected Powerful Owl was sighted 1.6 km north-west and 1.6 km west-north-west of the site. The sensitivity class 3 vulnerable, protected Masked Owl was also spotted 1.6 km north-west of the site. The vulnerable, protected Yellow-bellied Glider was sighted in three locations along Currency Creek; 500 m west, 1.2 km west-south-west and 1.4 km south-west.

The subject site is not identified as containing a critical habitat or biodiversity, but does contain an area of connectivity between significant vegetation according to the Terrestrial biodiversity map in the Hawkesbury LEP 2012. It is not zoned E2 – Environmental Conservation or E3 – Environmental Management.

Table 6-3: List of threatened species in the selected area within the last 5 years

Kingdom	Scientific Name	Common Name	NSW Status	Sightings
Animalia	<i>Pseudophryne australis</i>	Red-crowned Toadlet	Vulnerable Protected	3
Animalia	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Vulnerable Protected	2
Animalia	<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable Protected	2
Animalia	<i>Lophoictinia isura</i>	Square-tailed Kite	Vulnerable Protected Sensitivity Class 3	3
Animalia	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Vulnerable Protected Sensitivity Class 3	3
Animalia	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	Vulnerable Protected Sensitivity Class 2	3
Animalia	<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable Protected	6
Animalia	<i>Ninox strenua</i>	Powerful Owl	Vulnerable Protected Sensitivity Class 3	6
Animalia	<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable Protected Sensitivity Class 3	1
Animalia	<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable Protected Sensitivity Class 3	1
Animalia	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable Protected	1
Animalia	<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable Protected	4
Animalia	<i>Artamus Cyanopterus cyanopterus</i>	Dusky Woodswallow	Vulnerable Protected	1



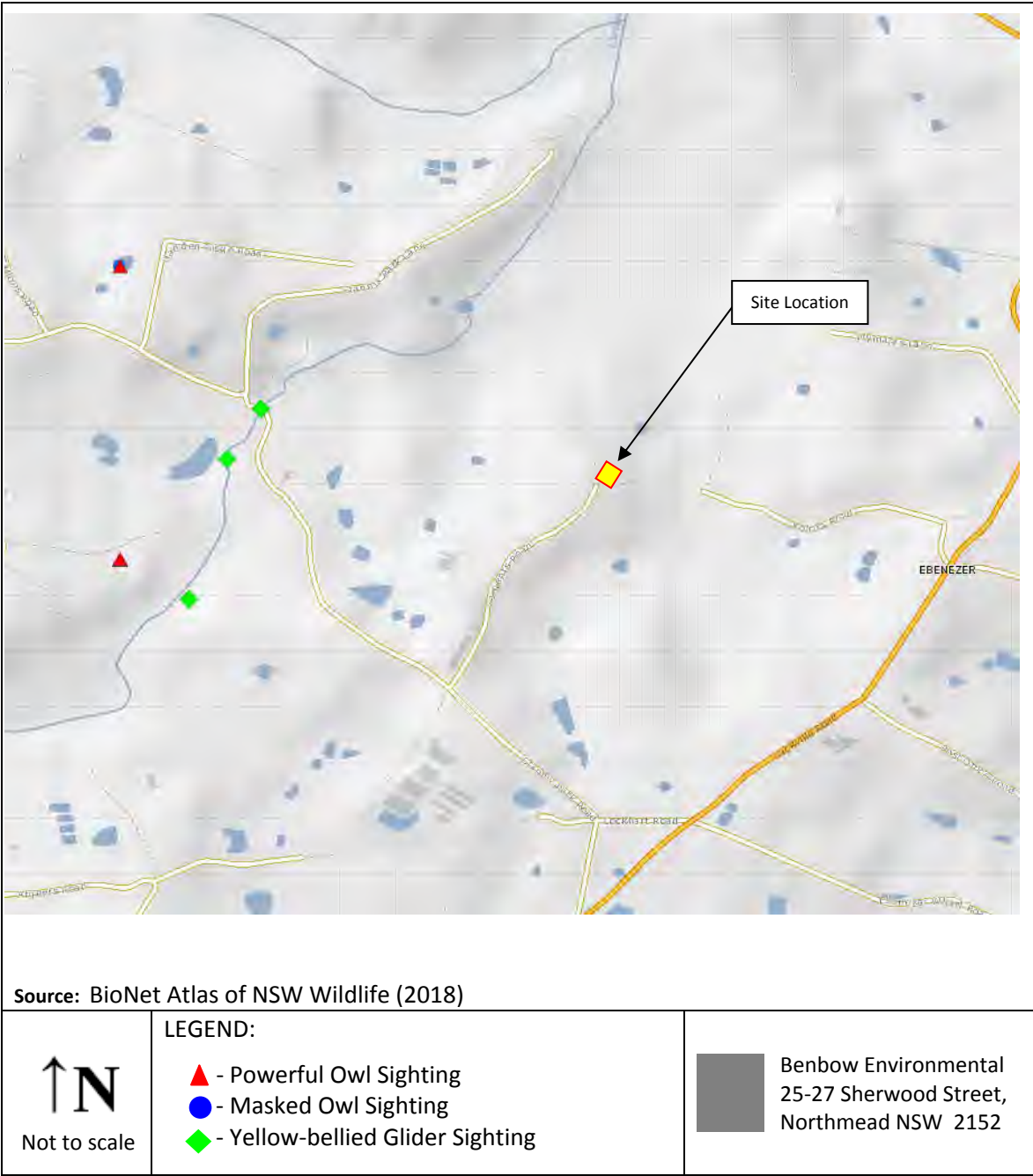
Table 6-3: List of threatened species in the selected area within the last 5 years

Kingdom	Scientific Name	Common Name	NSW Status	Sightings
Animalia	<i>Petroica phoenicea</i>	Flame Robin	Vulnerable Protected	1
Animalia	<i>Petaurus australis</i>	Yellow-bellied Glider	Vulnerable Protected	35
Animalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	Vulnerable Protected	4
Animalia	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	Vulnerable Protected	3
Animalia	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	Vulnerable Protected	5
Animalia	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable Protected	3
Animalia	<i>Miniopterus australis</i>	Little Bentwing-bat	Vulnerable Protected	1
Animalia	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	Vulnerable Protected	6
Animalia	<i>Myotis macropus</i>	Southern Myotis	Vulnerable Protected	7
Animalia	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable Protected	4
Animalia	<i>Vespadelus troughtoni</i>	Eastern Cave Bat	Vulnerable Protected	1
Animalia	<i>Pommerhelix duralensis</i>	Dural Woodland Snail	Endangered	24
Plantae	<i>Acacia pubescens</i>	Downy Wattle	Vulnerable Protected	12

Note: Data taken from between January 2013 and July 2018.



Figure 6-6: Nearby fauna sightings



6.4.1 Significant Vegetation

The site is classified by the Hawkesbury LEP 2012, as areas of Significant Vegetation and as an area of Connectivity Between Significant Vegetation.

The Hawkesbury LEP 2012 states;

6.4 Terrestrial biodiversity

- (1) The objective of this clause is to maintain terrestrial biodiversity by:
- (a) protecting native fauna and flora, and
 - (b) protecting the ecological processes necessary for their continued existence, and



(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

(2) This clause applies to land identified as “Significant vegetation” and “Connectivity between significant vegetation” on the Terrestrial Biodiversity Map.

(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:

(a) whether the development:

(i) is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

(ii) is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and

(iii) has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and

(iv) is likely to have any adverse impact on the habitat elements providing connectivity on the land.

(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

Although only the Powerful Owl, Masked Owl and Yellow-bellied Glider have been sighted within close proximity, the rural area the site is located in provides potential habitat for many of the threatened plants and animals mentioned in Table 6-3. The wetland area 200 m north of the site (Figure 6-6) also provides vital habitat for protected and threatened species as well as other migratory species.

6.5 NOISE AMENITY

The following sections describe the existing acoustical environment of the site and surrounding area, with specifics on the nearest sensitive receivers, noise monitoring results and relevant meteorological conditions. For more details refer to the Noise Impact Assessment, provided in Appendix 2.

6.5.1 Nearest Receptors

Table 2-1 identifies the nearest sensitive receptors that have the potential to be affected by the proposal. The aerial photographs of the sensitive receivers are shown in Figure 6-7. These receptors were selected based on their proximity and directional bearing from the subject site.



Table 6-4: Nearest Receivers

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Type of Receptor
R1	103 Stannix Park Lane, Wilberforce	Lot 111 DP 1171265	1230 m N	Residential
R2	82 Stannix Park Lane, Wilberforce	Lot 112 DP 1171265	930 m NW	Residential
R3	60 Stannix Park Lane, Wilberforce	Lot 2153 DP 1073493	890 m NW	Residential
R4	235 Stannix Park Road, Wilberforce	Lot 2 DP 48682	1240 m W	Residential
R5	283 Stannix Park Road, Wilberforce	Lot 1 DP 847274	1040 m W	Residential
R6	71 Sargents Road, Ebenezer	Lot 91 DP 1049276	390 m SW	Residential
R7	79 Sargents Road, Ebenezer	Lot 92 DP 1049276	Adjacent SW	Residential
R8	56 Sargents Road, Ebenezer	Lot 100 DP 1044703	520 m S	Residential
R9	89 Kolora Road, Ebenezer	Lot 4 DP 253783	650 m SE	Residential
R10	65 Kolora Road, Ebenezer	Lot 3 DP 253783	480 m SE	Residential
R11	88 Kolora Road, Ebenezer	Lot 2 DP 557365	350 m SE	Residential
R12	96 Kolora Road, Ebenezer	Lot 1 DP 557365	390 m NE	Residential



6.5.2 Existing Acoustic Environment

The level of background and ambient noise is assessed separately for the daytime, evening and night time assessment periods. The NSW EPA Noise Policy for Industry defines these periods as follows:

- **Day** is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays;
- **Evening** is defined as 6.00pm to 10.00pm, Monday to Sunday and Public Holidays; and
- **Night** is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

An attended noise measurement was conducted on the 18th of October at one (1) residential location.

6.5.2.1 Measured Noise Levels

6.5.2.1.1 Short Term Operator Attended Noise Monitoring Results

Attended noise monitoring was conducted on Thursday the 18th of October 2018 in order to gain an understanding of the background noise sources of the area. Noise contributions were obtained from ambient noise sources such as local fauna, road traffic and industrial sources. The results of the short-term attended noise monitoring are displayed in Table 6-5.

The attended measurements showed that the background noise levels were dominated by constant bird chirping from surrounding bushland. Ambient noise levels consisted of dogs, aeroplanes, road traffic from nearby roads and residential noise from neighbouring sites. The background noise level was measured to be 34 dB(A).

Table 6-5: Operator Attended Noise Measurements, dB(A)

Location & Date/Time	L _{Aeq}	L _{A90}	L _{A10}	L _{A1}	Comments
Location A Thursday 18/10/2018 9:32 Daytime Period	49	34	48	59	Car Sargents Road < 65 dB(A) Truck Air Brakes Sackville Ferry Road < 43 dB(A) Birds Chirping < 57 dB(A) Aeroplane < 48 dB(A) Dog < 48 dB(A) Trucks Stannix Park Road < 41 dB(A)

6.5.2.1.2 Long-Term Unattended Noise Monitoring Results

Based upon the site visit and the L_{A90} from the attended noise measurement, it was decided that any long term measurements on site would fall below the minimum rating background level (RBL) as per Table 2.1 of the Noise Policy for Industry. The minimum RBL is shown in Table 6-6 below.



Table 6-6: Unattended Noise Monitoring Results, dB(A)

Monitoring Location and associated receptors	Assessment Background Level ABL (L ₉₀)		
	Day	Evening	Night
Logger A	35 ¹	30 ¹	30 ¹

Note 1: As per Table 2.1 of the Noise Policy for Industry, the minimum assumed background noise levels are 35 dB(A) for the day period, 30 dB(A) for the evening period and 30 dB(A) for the night period.

6.5.3 Meteorological Conditions

The full Noise Impact Assessment (Appendix 2) assessed whether wind and temperature inversions are considered to be a feature of the area with the following conclusions:

- Source-to receiver wind speeds of 3 m/s or below are present for less than 30% of the time therefore wind effects have not been included in the assessment.
- As the site will not be operating during the night period, temperature inversions have not been considered in the noise impact assessment.

The following conditions will be considered in this noise impact assessment considered:

- Condition A: Neutral Weather Conditions.

Details of the considered meteorological conditions have been displayed in Table 6-7.

Table 6-7: Meteorological Conditions Assessed in Noise Propagation Modelling

Condition	Classification	Ambient Temp.	Ambient Humidity	Wind Speed	Wind Direction (blowing from)	Temperature Inversion	Affected Receiver	Applicability
A	Neutral	10 °C	70%	-	-	No	All	All periods

6.6 BACKGROUND AIR QUALITY

Background air quality parameters were obtained from the closest NSW EPA Richmond air quality monitoring station located approximately 6.7 km west of the subject site, inside the campus of the University of Western Sydney, Hawkesbury. This station is considered to be site-representative. The relevant assessable pollutant parameters available from the monitoring station are PM₁₀ and PM_{2.5}. Data was obtained for 2015 as it was considered the most representative year.

A summary of this data is provided in Table 6-8.



Table 6-8: Summary of 2015 Data for PM_{2.5} and PM₁₀ from Richmond Air Quality Monitoring Station.

Pollutant	Averaging period	Concentration (µg/m ³)
PM _{2.5}	Maximum 24 hr average for 2015	24.5
	2 nd highest 24 hr average for 2015	24.4
	3 rd highest 24 hr average for 2015	23.8
	Annual average for 2015	8.2
PM ₁₀	Maximum 24 hr average for 2015	49.3
	2 nd highest 24 hr average for 2015	35.8
	3 rd highest 24 hr average for 2015	35.6
	Annual average for 2015	17.6

Note: Bold values exceed the *Approved Methods* criteria.

6.7 CLIMATE

This section provides background information on the meteorological conditions of the existing area surrounding the proposed development. The referenced meteorological information for rainfall and temperature has been sourced from the Bureau of Meteorology (BoM) monitoring station at Richmond RAAF, Station No. 067105. This station is located approximately 6.7 km west of the subject site and is considered suitable for reference to general climate conditions in the local area.

6.7.1 Temperature

The mean annual minimum and maximum temperatures at Richmond RAAF are 11.1°C and 24.3°C respectively. The lowest temperatures occur in July, with a mean maximum of 17.7°C and a mean minimum of 3.5°C. The hottest temperatures are recorded during January, with the highest maximum average of 30.4°C. This data is shown in Table 6-9.

Table 6-9: Temperature Statistics at Richmond RAAF

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Parameter													
Mean Maximum Temperature (°C)	30.4	29.3	27.1	24.2	20.9	18.0	17.7	19.8	22.9	25.3	27.1	28.9	24.3
Mean Minimum Temperature (°C)	17.9	17.7	15.8	11.7	7.5	5.3	3.5	4.4	8.0	11.2	14.2	16.2	11.1

Source: Bureau of Meteorology, 2019

Note: Statistics are based on data collected from the Year 1993 to 2019

6.7.2 Rainfall

Rainfall data from Richmond RAAF shows mean annual rainfall of 728.4 mm, which results in a monthly mean of 60.7 mm. February is the wettest month, where the mean rainfall reading is 110.1 mm, while the driest month is July with 27.5 mm mean rainfall. The annual mean number of rainy days (with rainfall above 1 mm) is calculated as 72.5 days. This data is shown in Table 6-10.



Table 6-10: Rainfall Statistics – Richmond RAAF

Months Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Rainfall (mm)	83.2	110.1	78.4	57.0	44.3	56.5	27.5	32.0	43.2	50.2	77.6	70.0	728.4
Decile 5 (Median) Rainfall (mm)	67.4	99.2	65.3	38.9	34.0	43.0	22.8	16.8	27.0	32.8	73.6	62.8	693.9
Mean No. of Days of Rain $\geq$ 1 mm	7.7	8.0	8.1	6.0	5.0	5.8	3.9	3.5	4.6	5.7	7.4	6.8	72.5

Source: Bureau of Meteorology, 2019

Note: Statistics are based on data collected from the Year 1994 to 2019

6.7.3 Wind

Seasonal wind rose plots for this site using Richmond RAAF base AWS data from 2015 have been included in Figure 6-8. Annual average wind speeds of 2.49 m/s and a calms frequency of 15.05% were estimated. Annual winds from the south-west were found to be dominant and were present at a frequency of approximately 15%.

The average summer wind speed was estimated to be 2.78 m/s, with a calms frequency of 10.47%. South-westerly, easterly, and north-easterly winds were found to be dominant at a frequency of around 17%, 16% and 15% respectively.

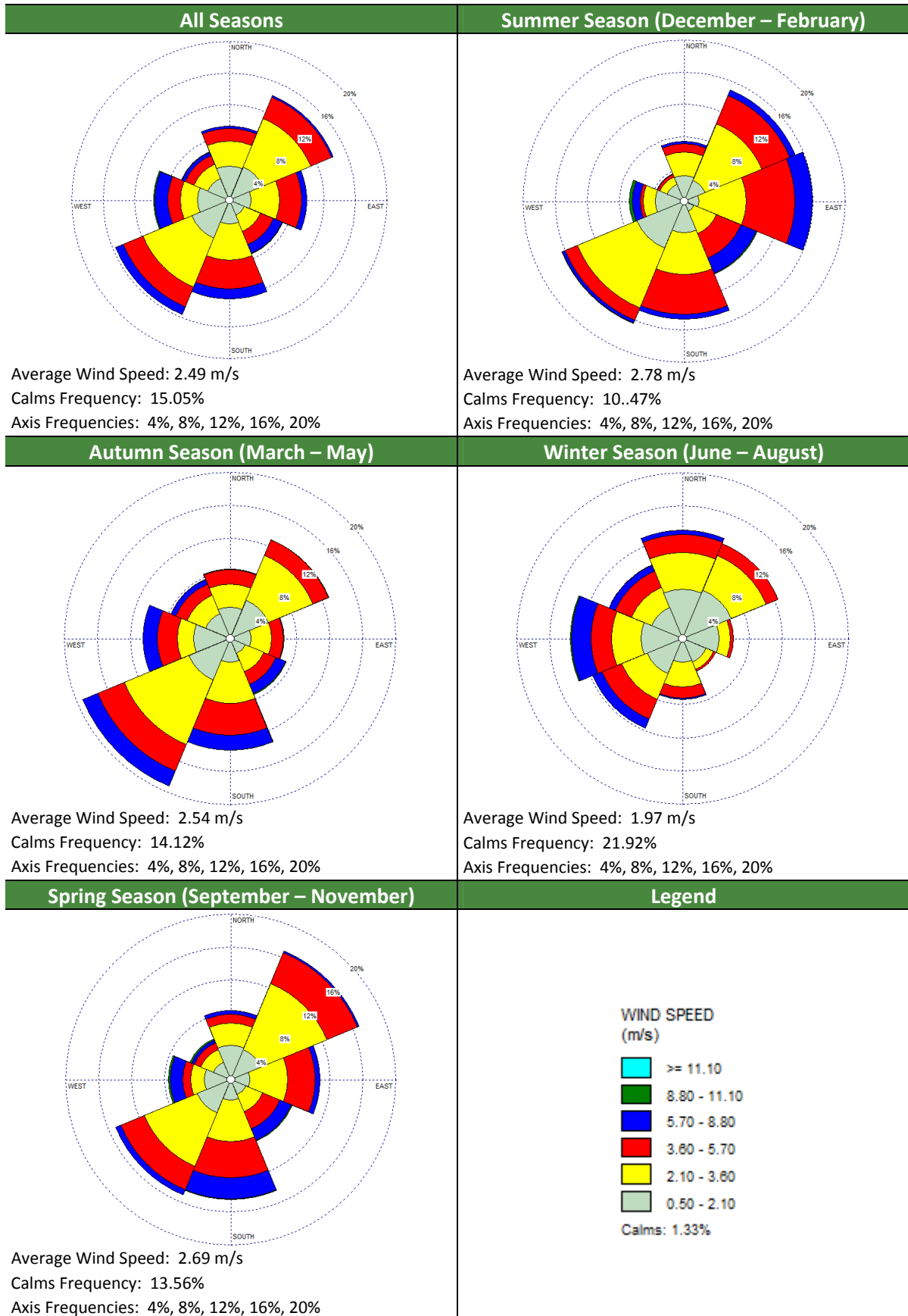
In autumn, dominant winds blew from the south-west (~19%). The average autumn wind speed was 2.54m/s with a calms frequency of 14.12%.

The winter season data showed the prevalence of winds from the western and northern directions. The dominant winds blew from the west at a frequency of ~14%. Winds from the south-west, north and north-east were also common, at around 12% frequency each. The average winter wind speed was 1.97 m/s with a calms frequency of 21.92%.

In the spring time, average wind speeds of 2.69 m/s were recorded. Dominant winds were from the north-east (17%), south-west (15%) and south (14%). The spring calms frequency was 13.56%.



Figure 6-8: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF base, Bureau of Meteorology (2015)





7. IDENTIFICATION AND PRIORITISATION OF ISSUES

The identification and prioritisation of the potential environmental impacts of the proposed development were fundamental steps in preparing the EIS.

This process involved the following stages:

1. Review of the proposal and existing site operations

Initial meetings with the proponent were undertaken to discuss the details of the proposal. This established the nature of the proposal, materials and processes to be undertaken and a concept site design. An inspection of the site and surrounding areas was undertaken which lead to identification of potential sensitive receptors.

2. Identification of planning requirements

Review of planning instruments that apply to the land was undertaken to determine any planning constraints and zoning rules affecting the property.

3. Guidelines and reference material

Past reports for the existing site were reviewed and relevant NSW government/ industry guidelines.

4. Preparation of Scoping Report

Experience with past projects at the site assisted in development of a Scoping Report that outlined the proposal and potential environmental impacts.

5. Consultation with regulatory authorities & stakeholders

Consultation with Hawkesbury City Council in a pre-lodgement meeting determined Council requirements and expectations. Secretary's Environmental Assessment Requirements for the EIS from the DP&E were obtained. This included feedback from NSW EPA, RFS, DPI Agriculture, DPI Fisheries and RMS.

These steps led to the design and objectives of the Proposal.

7.1 SUMMARY OF POTENTIAL ISSUES

The statutory requirements and past reports in conjunction with the government consultation process enabled the identification of the potential issues associated with the proposal. These are listed below in alphabetical order:

- Air quality;
- Chemical management;
- Contamination;
- Cumulative impacts;
- Fire and incident management;



- Flooding;
- Flora and Fauna/Biodiversity;
- Hazards and risk;
- Heritage;
- Human health and safety;
- Noise and vibration;
- Soil and land;
- Strategic context;
- Traffic and transport;
- Visual amenity;
- Waste management; and
- Water.

SEARs (document reference 1249) were provided on 10 September 2018 by the DP&E (refer to Attachment 1) and provides general requirements for the EIS as well as key issues to assess. The DP&E stated that 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 key issues must be addressed:

- Strategic context;
- Suitability of the site;
- Waste management;
- Hazards and risk;
- Air quality;
- Noise and vibration;
- Soil and water;
- Fire and incident management;
- Traffic and transport;
- Biodiversity;
- Visual; and
- Heritage including Aboriginal and non-Aboriginal cultural heritage.

EPA's key information requirements for the proposal include an adequate assessment of:

- Waste management;
- Waste Types;
- Wheelwash;
- Water flow diagram & water balance; and
- Noise.

NSW Rural Fire Service have indicated there is no objection to the proposed designated development and have requested that a bushfire report be prepared as part of the EIS.

The Department of Primary Industries – Agriculture requested details regarding:

- Site suitable for development;
- Consideration for impacts to agricultural resources and land;
- Bushfire risk;
- Suitable and secure water supply;
- Surface and groundwater;



- Biosecurity;
- Traffic movements;
- Visual amenity
- Land stewardship;
- Community consultation; and
- Contingency Environmental Management Plan.

The Department of Primary Industries – Fisheries noted the proposed site is surrounded by coastal wetlands to the north, east and west as listed under the Coastal Management SEPP 2018. DPI Fisheries requested more information regarding the extent of the proposed development and whether it falls within a mapped area of coastal wetland or the mapped proximity area for the coastal wetland. The following information is requested:

- Potential flow on effects from site establishment and operational activities including:
 - ▶ The use of pesticides and fertilisers on the orchard;
 - ▶ Dust from waste recovery operations and trucks on unsealed roads;
 - ▶ Runoff and leaching of contaminants and chemicals from the site, particularly in relation to the adjacent coastal wetland.

It should be noted that the proposed orchard is not part of this proposed development.

The Roads and Maritime Services requires a Transport and Traffic Impact Assessment to address the following:

- Daily and peak traffic movements including impact on nearby intersections & the need/funding for road improvements. The following key intersection is to be modelled using SIDRA and swept path plans provided:
 - ▶ Sackville Road/Stannix Park Road.
- Proposed access and parking provisions;
- Proposed car parking spaces;
- Details of light and heavy vehicle movements.

Further consultation with Hawkesbury City Council in November 2019 determined additional requirements to be included in the EIS, these are summarised below:

- Address zone objectives to demonstrate the proposal is consistent with the rural zoned locality;
- Registered quantity surveyor's detailed cost report;
- Bushfire assessment report – Asset Protection Zones and Proposed Tree Removal;
- Flora and fauna assessment;
- Erosion and Sediment Control Plan;
- Updated Site Plan, Colours and Materials Schedule.

Based on all the above considerations, potential issues have been prioritised as follows:

- Noise and vibration
A noise impact assessment is required due to the large number of noise generating sources proposed and the proximity to sensitive receptors.



- **Air quality and odour**
An air quality assessment is required due to the potential for dust to be generated from the processes and stockpiling of material. Therefore, a quantitative assessment has been undertaken.
- **Traffic and transport**
A full traffic assessment has been undertaken due to the potential for traffic increases to impact on the existing road network and issues raised by the RMS.
- **Strategic Context**
A detailed justification for the proposal and suitability of the site was undertaken. The proposal also needed to be assessed against all relevant planning strategies, environmental planning instruments and development control plans.
- **Waste management & Types**
The proposed facility would accept and process waste materials. Therefore, the management of waste has been addressed in detail.
- **Flora and Fauna / Biodiversity**
Preliminary findings determined that land does not include or comprise critical habitat, nor is it in the immediate vicinity of any threatened species. Some vegetation would require removal, however this is in an area already disturbed and partially cleared. A concept Landscaping plan and a brief discussion was initially provided.

A coastal wetlands area is located adjacent to the site. Therefore it is important that off-site pollution is minimised.

Additional consultation with Council determined that a detailed biodiversity assessment is required. Council advised that “whilst the site is not mapped under the NSW Biodiversity Values map, it is mapped under Council’s terrestrial biodiversity maps as containing endangered ecological communities.” Therefore, a BDAR was prepared by a qualified ecologist to assess the significance of the trees proposed for removal and whether any trees to be removed that should be retained for ecological purposes.

- **Hazards and Risks (including Chemical Management and Fire & Incident Management and Bushfire)**

No hazardous chemicals are to be used in the process. Chemical management has been assessed. Quantities of chemicals are relatively minor and do not trigger SEPP 33, therefore a preliminary hazard analysis is not required.

Fire is a potential environmental issue as the site will contain some combustible materials and store mulch. Therefore, the fire risk has been assessed.

A bushfire assessment is required.

- **Water**
The proposed operations would not require water. Water use is limited to ancillary activities such as in the washbay, for dust suppression and in the office/amenities. Rainwater would supply the water for site use. Additionally, there is potential for contamination of surface



waters from sediment runoff from external stockpiles. Therefore, a qualitative water assessment has been undertaken.

The site is in an area of Probably Maximum Flood Hazard Extent and a flood assessment has been undertaken.

- **Soil**
The proposed construction will require some minor excavation to establish footings and foundations for the proposed new buildings. Further, proposed operations have the potential to impact on soils and the site is located in an area of Class 3 and 5 acid sulfate soils. Therefore, a Phase I Environmental Site Investigation, Preliminary Acid Sulfate Soil Assessment & a qualitative soil assessment has been undertaken.
- **Visual amenity**
The existing site is in a rural area. New buildings would be constructed. The site is located at substantial separation distances to nearest receptors. Visual amenity of the site is therefore briefly discussed.
- **Heritage**
The site does not contain any heritage items. Therefore, a detailed assessment is not warranted.
- **Cumulative Impacts**
Due to the size and nature of the proposed development, controlling for direct environmental impacts would minimise any cumulative impacts from the proposed development. Cumulative impacts are briefly discussed.
- **Human Health and Safety**
Incoming materials are inert and therefore a detailed assessment is not warranted. A brief discussion is provided.



8. ENVIRONMENTAL IMPACTS AND SAFEGUARDS

8.1 AIR QUALITY

An Air Quality Impact Assessment has been undertaken for the proposed development. A full copy of the AQIA is provided as Appendix 1.

8.1.1 Dust Assessment Criteria

TSP, PM₁₀ and PM_{2.5} emissions were modelled for the operation of the proposed resource recovery facility in accordance with the *“Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales”* (EPA 2016). Odour is not considered as a potential emission that would be generated from the proposed development and therefore was not assessed.

8.1.2 Dust Control Measures

The following mitigation measures will be implemented at the subject site for the purposes on minimising emissions of dust:

- Crushing and screening occurs within an enclosed building;
- Stockpiles are stored in walled bays and use water sprayers; and
- Truck wash facilities are present on site.

These measures were accounted for in the dispersion modelling.

8.1.3 Dispersion Model and Emission Data

The air dispersion model AERMOD was used for the prediction of off-site dust impacts associated with the air emissions from the proposed operations.

The AQIA uses emission data adopted from the NPI EETM for Mining (2012) and NPI EETM for Mining and Processing of Non-Metallic Minerals (2014) (crushed stone processing data) in this assessment to represent the sites activities. The relevant NPI documents do not include data for estimating emission of PM_{2.5}.

The *Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emissions Factors* (2006) gives a ratio of 0.15 PM_{2.5}/PM₁₀ for ‘Aggregate Handling and Storage Piles’ which was used to estimate PM_{2.5} emissions for wind erosion from external stockpiles.

The US EPA AP-42 *Appendix B.2 Generalized Particle Size Distributions* (1996) data for ‘Mechanically Generated Processed Ores and Non-metallic Minerals’ gives a ratio of 0.35 PM_{2.5}/PM₁₀ which was used to estimate PM_{2.5} emissions from crushing and screening activities.

8.1.4 Predicted Impacts

TSP and PM₁₀ emissions at all sensitive receptors were predicted to comply with the *Approved Methods* criterion for an annual averaging period. Emissions of PM_{2.5} do not comply with the annual criterion of 8 µg/m³. This is attributed to the annual background levels that already



exceed. The maximum predicted increment is $0.01 \mu\text{g}/\text{m}^3$, this impact is considered to be negligible.

The maximum predicted impacts for the 24 hour averaging period of PM_{10} exceed the criterion of $50 \mu\text{g}/\text{m}^3$ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolora Road, Ebenezer) with impacts of $50.29 \mu\text{g}/\text{m}^3$, $50.45 \mu\text{g}/\text{m}^3$, $50.2 \mu\text{g}/\text{m}^3$ respectively. This is attributed to elevated daily background concentrations.

Contemporaneous addition of the predicted daily increments of PM_{10} with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM_{10} would result due to the proposed site activities.

Dust control measures are proposed for the site activities and are considered effective. No further controls are recommended.

8.2 NOISE

A full Noise Impact Assessment has been undertaken for the proposed development and is provided in Appendix 2. This section summarises the noise impact assessment. Section 6.5 details the nearest sensitive receivers and existing acoustic environment

8.2.1 Operational Noise Impact Assessment

8.2.1.1 Project Noise Trigger Levels

The project noise trigger levels for the site have been established in accordance with the principles and methodologies of the NSW Noise Policy for Industry (EPA, 2017).

The table below presents the rating background level, project intrusive noise level, recommended amenity noise level, and project amenity noise level. The project noise trigger level is the lowest value of intrusiveness or project amenity noise level after conversion to $L_{\text{Aeq } 15 \text{ minute}}$, dB(A) equivalent level. Sleep disturbance trigger levels associated with operational activities are presented in Table 8-1 below.

Table 8-1: Project Noise Trigger Levels (PNTL) for Operational Activities, dB(A)

Receiver	Type of Receptor	Time of day	Rating background noise level	Project intrusiveness noise level ($L_{\text{eq}(15 \text{ minute})}$)	Recommended amenity noise level $L_{\text{Aeq period}}$	Project amenity noise level $L_{\text{Aeq } 15 \text{ minute}}^2$	PNTL $L_{\text{Aeq } 15 \text{ minute}}$
R1-R12	Residential - Rural	Day	35 ¹	40	50	48	40
		Evening	30 ¹	35	45	43	35
		Night	30 ¹	35	40	38	35

Notes:

- 1) These value are based on the minimum assumed rating background levels as outlined in Table 2.1 of the Noise Policy for Industry.
- 2) These levels have been converted to $L_{\text{Aeq } 15 \text{ minute}}$ using the following: $L_{\text{Aeq } 15 \text{ minute}} = L_{\text{Aeq period}} + 3 \text{ dB}$ (NSW Noise Policy for Industry Section 2.2).



8.2.1.2 Predicted Impacts

Noise propagation modelling was carried out using Sound PLAN v7.3. One operational scenario was considered in the noise model. The noise generating scenario considered a situation where all noise sources on site were operating over the 15 minute assessment period simulating a worst case situation (Scenario 1). This scenario was remodelled with the eastern most roller shutter (door 4) closed (Scenario 2).

Results of the predictive noise modelling of the operational activities are shown in Table 8-2.

During operations, noise levels are predicted to comply with the Noise Policy for Industry criteria at all receivers during all scenarios.

It is therefore concluded that the proposed site activities will not have a detrimental impact on the neighbouring receivers, if the noise control measures in section 8.2.1.3 are carried out.

Table 8-2: Noise Modelling Results Associated with Operational Activities, L_{eq} , dB(A)

Receiver	Criteria: PNTL ($L_{eq,15 \text{ minute}}$ dB(A)) – Day	Predicted: Scenario 1 ($L_{eq,15 \text{ minutes}}$ dB(A))	Predicted: Scenario 2 ($L_{eq,15 \text{ minutes}}$ dB(A))
R1	40	20✓	20✓
R2	40	22✓	22✓
R3	40	22✓	22✓
R4	40	18✓	18✓
R5	40	19✓	19✓
R6	40	28✓	28✓
R7	40	31✓	31✓
R8	40	36✓	35✓
R9	40	35✓	34✓
R10	40	37✓	36✓
R11	40	41✗	40✓
R12	40	34✓	34✓

8.2.1.3 Noise Control Measures

In order to achieve the predicted compliance levels at the nearest receptors, the following control measures are recommended to be implemented.

- Site activities are recommended to be limited to the day period.
- The crushing and screening activities are recommended to take place inside the unloading and processing shed.
- The roof and walls of the industrial building to be constructed of 0.5 mm colorbond sheet steel ($R_w = 22 \text{ dB}$). The floor will be concrete.



- Eastern most roller shutter door (roller shutter door 4) is closed when the crusher is operating.
- It is recommended mobile equipment regularly used onsite such as the excavator and front end loader be fitted with reversing lights or a white noise reversing alarm.

It is also recommended the following additional management practices be implemented:

- Prohibition of extended periods of on-site revving/idling;
- Minimisation of the use of truck exhaust brakes on site;
- Enforcement of low on-site speed limits; and
- On-site vehicles to be maintained in accordance with a preventative maintenance program to ensure optimum performance and early detection of wearing or noisy components.

8.2.2 Road Traffic Noise Impact Assessment

A description of the calculation methodology and the noise predictions associated with road traffic has been provided below.

Calculation of road traffic noise contribution has been undertaken using the Calculation of Road Traffic Noise (CoRTN) algorithm within SoundPLAN v7.3. The CoRTN algorithm was utilised to predict the existing and proposed noise levels at the nearest residential receivers during the day period.

The noise modelling assumes conservatively that a maximum of 2 truck movements per hour during the day between 7am and 5pm are associated with the proposed development. No truck movements are proposed during the night period. Vehicles are assumed to travel along Sargents Road at 60 km/h.

The $L_{Aeq, 1 \text{ hour}}$ noise descriptor has been calculated at the most affected residential receptor located along Sargents Road. The predicted noise levels are displayed in Table 8-3. The highest noise levels would be predicted at this location, therefore they are the only results displayed.

Table 8-3: Predicted Levels for Road Traffic Noise

Receptor	Noise Criteria		Site Contribution	
	Day $L_{Aeq, 1 \text{ hour}}$	Night $L_{Aeq, 1 \text{ hour}}$	Day $L_{Aeq, 1 \text{ hour}}$	Night $L_{Aeq, 1 \text{ hour}}$
37 Sargents Road, Ebenezer	55	50	45 ✓	N/A ✓

For the residential dwellings that front onto Sargents Road, the predicted noise levels associated with the vehicle movements from the site would be below the daytime criteria of $L_{Aeq (1 \text{ hour})}$ 55 dB for local roads.

Step 3 of Section 3.4.1 of the RNP identifies possible reasonable and feasible control measures when exceedances of either the outlined criteria. As no exceedances are predicted, the proposed vehicle movements comply with the RNP, and no additional mitigation strategies are recommended.



8.2.3 Construction Noise Impact Assessment

8.2.3.1 Construction Noise Impacts

Construction activities are proposed to include the following:

- Site establishment;
- The building of the unloading and processing shed; and
- The installation of a wash bay and weighbridge.

The three construction stages listed above are modelled for civil works, concreting works and structure works. The noise generating stages consider a worst case scenario in which all equipment is running for 100% of the time over the 15 minute assessment period.

The equipment list for the stages is detailed in Table 8-4. Equipment is primarily located in the area of the proposed unloading and processing shed, as the majority of the construction works will take place at this location.

Table 8-4: Modelled Noise Stages for Proposed Construction Works

Scenario	Time of the day	Noise Sources for Worst 15-minute Period
Stage 1. Civil Works	Standard hours	• Dozer • Backhoe • Truck • Hand tools
Stage 2. Concreting construction works	Standard hours	• Concrete mixer truck • Concrete pump • Hand tools
Stage 3. Structure construction works	Standard hours	• Truck • Crane • Hand Tools

8.2.3.2 Construction Predicted Noise Levels

Results of the predictive noise modelling of the construction activities are shown in Table 8-5. Compliance is predicted with the day noise criteria at all receptors and stages of construction.

Construction activities are therefore proposed to take place during standard **construction** hours only as follows:

Monday to Friday:	7am to 5pm (with no hammering or saw-cutting to occur before 7.30am)
Saturday:	8am to 1pm (with no hammering or saw-cutting to occur before 8.30am)



Table 8-5: Noise Modelling Results Associated with Construction Activities for L_{eq} , dB(A)

Receiver	Criteria: PSNL ($L_{eq,15\text{ minute}}$ dB(A))	Predicted Levels: Stage (Standard Hours) (L_{eq} , dB(A))		
	Standard Hours	1	2	3
R1	45	24 ✓	25 ✓	25 ✓
R2	45	27 ✓	28 ✓	28 ✓
R3	45	28 ✓	29 ✓	29 ✓
R4	45	24 ✓	25 ✓	26 ✓
R5	45	24 ✓	24 ✓	26 ✓
R6	45	31 ✓	33 ✓	34 ✓
R7	45	39 ✓	40 ✓	41 ✓
R8	45	34 ✓	34 ✓	35 ✓
R9	45	32 ✓	33 ✓	33 ✓
R10	45	34 ✓	36 ✓	35 ✓
R11	45	40 ✓	42 ✓	40 ✓
R20	45	37 ✓	40 ✓	38 ✓

✓Complies ✗ Non-compliance

8.2.4 Statement of Potential Noise Impacts

A noise impact assessment was undertaken to assess the potential noise emissions from the proposed development located at 99 Sargents Road, Ebenezer.

The noise impact assessment was undertaken in accordance with the following guidelines:

- NSW Environment Protection Authority Noise Policy for Industry 2017;
- Department of Environment, Climate Change and Water NSW Road Noise Policy 2011; and
- Department of Environment, Climate Change and Water NSW Interim Construction Noise Guideline 2009.

The nearest receivers and noise criteria were identified. The site operations were modelled using the predictive noise software, Sound Plan V7.3.

The activities proposed by the proponent were found to be within the framework of the NSW Noise Policy for Industry. The noise generating scenarios are predicted to comply with the project specific noise levels at all receivers. Recommendations for noise controls are given in section 8.2.1.3, including operational hours and shed details.

Compliance with the guidelines set out in the NSW Road Noise Policy was predicted at all considered receptors.

Construction activities are recommended to be limited to standard hours in accordance with the Interim Construction Noise Guideline.



8.3 WATER

This section describes the existing receiving environment, how water is managed on site and the safeguards that would be implemented to prevent stormwater contamination.

8.3.1 Water Interactions

8.3.1.1 Supply & Use

Two 22,000 Litre rainwater tanks would be installed to supply water to the development for ancillary processes. Water would not be required for the processing operations. Additional water if needed would be purchased.

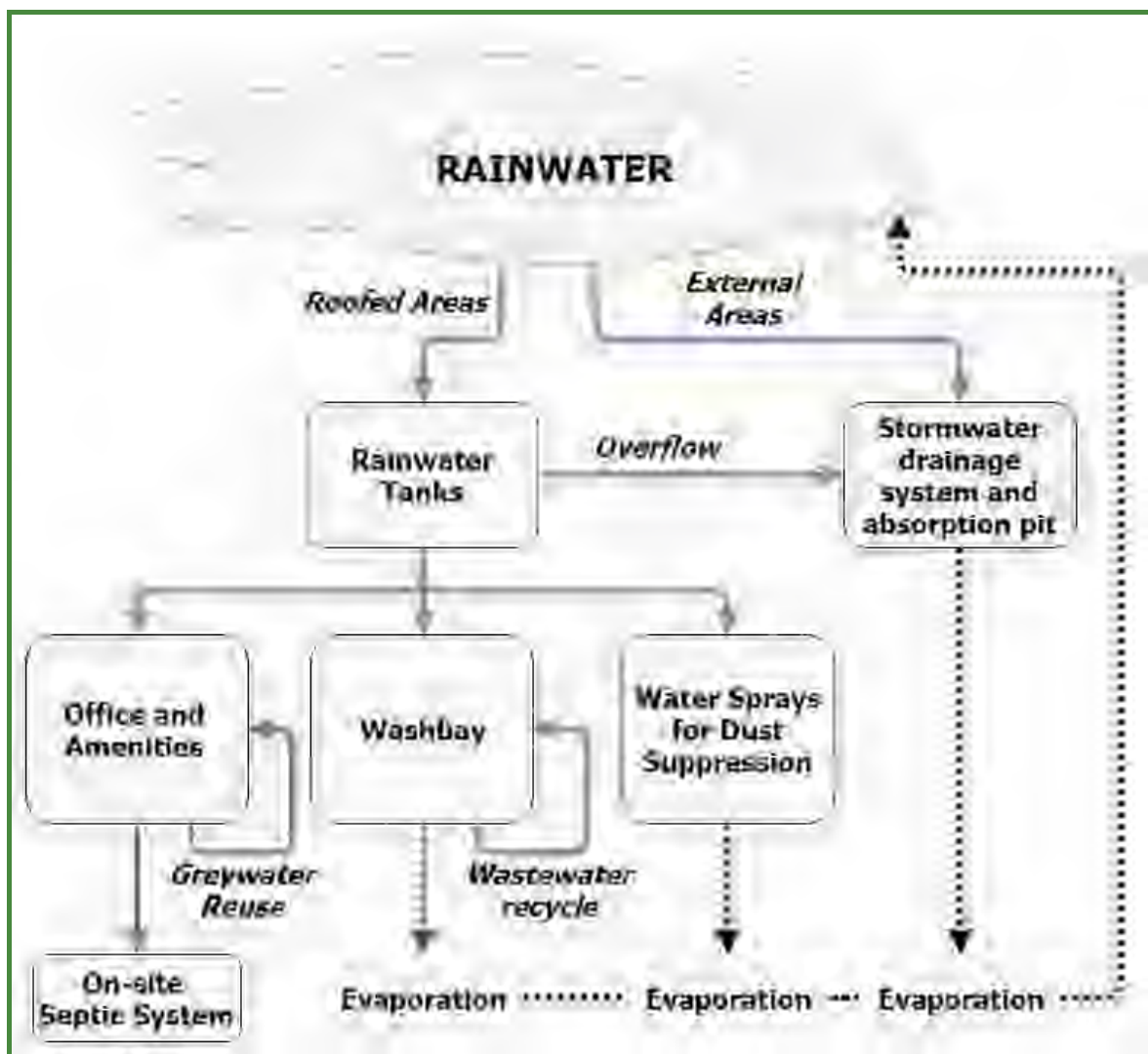
Water would be used in a wash bay for washdown of trucks. The wash bay would be a closed loop system that may require periodic clean out by a licensed waste contractor. The washbay would contain a water filtration system that would remove oil, grease, detergent and suspended solids from washdown water and treated water would be stored in a tank for reuse in the system.

Water would also be used for dust suppression purposes. A system of water sprayers would be installed over stockpile storage bays that release a fine mist adequate to dampen stockpiles without creating wastewater. This water would be sourced from the rainwater tanks.

Rainwater tanks would be equipped with a level indicator which would show if water resources are low and tanks would be replenished with a water cartage service.

A water balance diagram for the proposed development is provided in the following figure:

Figure 8-1: Water Balance Diagram



8.3.1.2 Wastewater

No wastewater would be generated from the processing or ancillary operations and a tradewaste agreement is not required.

A septic system would be installed to treat sewage from the amenities building. This would be a sealed container used to break down sewage and the effluent would be irrigated onto the land or directed to a holding tank and removed by waste tanker. An approval from Hawkesbury Council is required and the system must be inspected by Council before occupation of the site. Details required for Council application would be dealt with at the construction stage.

8.3.1.3 Surface Water & Stormwater Runoff

There is potential for stormwater runoff to be contaminated with sediment from external stockpiles. This would be managed with a silt arrestor and absorption pit described in further detail in Section 8.3.4.



8.3.1.4 Leachate

“Leachate” is defined by the NSW EPA in the Environmental Guidelines: Solid Waste Landfills as:

Liquid released by, or water that has percolated through, waste and which contains dissolved and/or suspended liquids and/or solids and/or gases.

Generally, leachate relates to liquid that percolates through landfills. In this case, stormwater percolating through the external storage bays would potentially generate “leachate”, however as the material to be stored is inert and is limited to VENM, ENM, concrete, bricks and garden waste or mulch, it is unlikely the leachate or stormwater runoff would contain harmful contaminants. Potential pollutants generated from the external storage of materials are identified in Section 8.3.7.

Stormwater runoff would be managed through an on-site drainage system, silt arrestor and absorption pit as shown on the Stormwater Concept Plan.

8.3.1.5 Groundwater

Groundwater is not proposed to be extracted nor used for the proposed development.

8.3.2 Water Legislation

8.3.2.1 Water Act, 1912

Licences for water conservation, irrigation, water supply or drainage as well as changing the course of a river can be applied for under the *Water Act 1912*.

The proposed development does not involve works for water conservation, irrigation, water supply or drainage and does not involve works that would change the course of a river, therefore, the *Water Act 1912* does not apply.

8.3.2.2 Water Management Act, 2000

The *Water Management Act 2000* (WMA Act) provides requirements for the extraction of water, water use, floodplain and drainage management, the construction of works such as dams and weirs, and undertaking activities on or near water sources in NSW. Approvals for the extraction and use of water and for the construction of works relating to water use can be obtained under the Act.

The development does not require approval under this act.

8.3.2.3 Water Sharing Plans

Two water sharing plans apply to the area where the subject site is located. These are:

- Water Sharing Plan for the Greater Metropolitan Region Unregulated River Sources; and
- Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources.

These do not apply to the proposed development.



8.3.3 Flooding

The Section 10.7 certificate indicates that the land or part of the land is subject to riverine flood related development controls referred to in Clause 6.3 of the Hawkesbury Local Environmental Plan 2012.

A flood impact assessment report has been undertaken, see Appendix 6.

The flood impact assessment considered the impacts of the proposed development to the existing flooding characteristics at the site and surroundings. The report concluded that the proposal does not have any adverse affects to the flooding behaviours at the site and surroundings and recommended the following:

- Minimum ground level for the proposed external stockpiles should be 13m AHD or higher; and
- Locate buildings above the 200 year ARI flood level.

8.3.4 Stormwater Management System

Mitigation measures to manage stormwater runoff would be implemented. Some stormwater would percolate through the permeable compacted roadbase surface. Excess stormwater runoff from external areas of the development would be directed to a silt arrestor and absorption pit. The base of the silt arrestor would be a gravel filter fitted with a geotextile fabric. Sediment would settle to the bottom and the overflow water would be released to the absorption pit which has a volume of 130m³ and is constructed of backfill with 25mm washed gravel or 25mm rock and grated cap with topsoil and grass surface.

8.3.5 Wash Bay

A heavy vehicle wash bay would be required for wash down of trucks. The wash bay would be a fully bunded and closed loop system that may require periodic clean out by a licensed waste contractor. The wastewater generated during washing would be washed into a central gutter and directed to a water filtration system that would remove oil, grease, detergent and suspended solids. Treated water would be stored in a tank for reuse in the system.

The water recycling system would be similar to an EL Water Recycling Plant – specification sheet attached.

8.3.6 Dust Suppression

Dust suppression of external storage bays would consist of a system of water sprayers (nozzles) that release a fine mist that adequately dampens stockpiles without creating wastewater. The system recommended to be installed would pressurise water at 1000 psi through nozzles designed to produce water droplet particles known as “fog” that encapsulate and suppress dust particles and drop to the ground. Fogging lines would be installed along storage bay walls and would require a pump control module.

Specifications for a coolfog system are provided in Attachment 4. Dust suppression system to be installed is recommended to be equivalent to this system.



8.3.7 Potential Pollutants

The nature of the materials to be stored at the site is inert. There would be a self-bunded diesel tank and minor chemical use only. The wash bay would generate oil, grease, sediment and possibly heavy metals from the vehicle washing. The potential pollutants to waters from the storage of these materials include:

- Heavy metals (e.g: lead, cadmium, chromium, copper and zinc).
- Total suspended solids (TSS);
- Elevated pH;
- Total recoverable hydrocarbons (TRH);
- BTEX (Benzene, toluene, ethylbenzene and xylene); and
- Polycyclic Aromatic Hydrocarbons (PAH).

Proposed activities, potential pollutants and pathways are summarised in the following table.

Table 8-6: Potential pollutants and pathways

Activity	Potential pollutants	Potential pathways
External storage of VENM & ENM, concrete, bricks and greenwaste.	• Total suspended solids • Elevated pH	Stormwater percolating through storage bays
Diesel storage & refuelling	• Total recoverable hydrocarbons • BTEX; • PAH	Spills and leaks
Vehicle washing	• Heavy metals • Total suspended solids • BTEX • PAH	Spills and leaks resulting in discharge of wastewater

8.3.8 Potential Water Impacts and Safeguards

In identifying potential impacts to waters, aspects of the proposed development to be considered include:

- All processing operations would be undertaken within a purpose built enclosed building.
- The external site area will consist of permeable compacted roadbase material.
- Materials stored externally would be inert.
- A self bunded diesel tank would be located external to the building.
- The wash bay would be a bunded closed loop system

Surface water has the potential to become contaminated by dust is generated during the unloading and loading of materials in external areas and can be deposited on the ground contributing to the sediment load of stormwater leaving the site. Heavy vehicles may track sediment on external surfaces of the site. This dust and sediment can subsequently result in contamination of surface waters.



Potential impacts to water from the proposed development and recommended safeguards are summarised in the table below.

Table 8-7: Potential Risks to Receiving Waters and Mitigation Measures

Potential Contaminant and Source	Potential Impact on Water	Safeguards and Mitigation Measures
Loading and Unloading & external storage of materials – VENM, ENM, concrete, bricks and greenwaste/mulch.	Sedimentation and contamination of stormwater by TSS and elevated pH	• Designated storage bays • Dust suppression system • Stormwater drainage channels and on site detention measures
Tracking of sediment and grit from truck tyres	Sedimentation and contamination of stormwater	• Stormwater drainage channels and on site detention measures
Diesel storage & refuelling spills and leaks	Contamination of stormwater runoff with total recoverable hydrocarbons	• Self bunded storage tank • Hydrocarbon spill kits
Vehicle washing	Overflow or incident at wash bay resulting in release of wastewater containing oil, grease, heavy metals and total suspended solids entering waterways	• Closed loop system • On-site water treatment and reuse • Bunded wash bay

With the above controls in place the potential risks to receiving waters is low. Water monitoring is not considered warranted, however, could be included during the initial 12 months of operation to obtain baseline data for future reference. This program should include monitoring for potential pollutants and be developed as part of the EMP.

8.3.9 Erosion and Sediment Control

An erosion and sediment control plan also called a Sedimentation plan would be implemented during construction. A copy of the plan is provided in Appendix 9. Erosion and sediment controls are shown on the stormwater concept plan would consist of the following:

- Stabilised site access (shakedown device) constructed with 40-75mm gravel or crushed rock and geotextile filter fabric and shaker pad. Runoff would be directed to a sediment trap;
- Sediment/silt fences to be installed at downstream side of any stockpiles and the development area; and
- Stabilised stockpile surface.

8.4 SOIL

The proposed building works and site development would involve earthworks which would result in disturbance to soil during construction. There is a low probability that acid sulfate soils exist at the site.



During site operations, processing activities would take place within the purpose built building and the external area would be capped with compacted roadbase. There would be diesel storage in a self bunded tank and use of a bunded closed loop heavy vehicle wash bay. Materials stored in external storage bays are inert. The risk of contamination to soil and land is mainly related to contaminated stormwater seeping into the ground. The management of risks to soil and the potential for contamination of soils from the proposed modifications is discussed in this section.

8.4.1 Soil Characteristics of the Site

The general soil characteristics of the site are described in section 6.1.1

The 'Penrith 1:100,000 Geological Map Sheet 9030' describes the geological composition of the area as clay, clayey sand, silt.

8.4.1.1 Acid Sulfate Soils

The site contains Class 5 acid sulfate soils on the *Hawkesbury LEP ASS Map*. A preliminary acid sulfate soil assessment (Appendix 4) was undertaken and determined that an acid sulfate soil management plan is not required.

8.4.1.2 Existing Contamination

A phase I environmental site assessment (Appendix 3) was undertaken for the site. The assessment found that a very low potential may exist for some minor soil contamination, due to the possibility of historical pesticide and/or herbicide use, immediately NW of the subject site. However, the potential level of contamination is expected to be negligible as agricultural practises ceased over sixty years ago and potential contaminants are not expected to pose significant risk to human health or the environment.

A phase II detailed site assessment was not considered warranted.

8.4.2 Potential Impacts to Soil and Land

8.4.2.1 Construction Works

Construction work involves cut and fill works and the construction of buildings requiring footings which requires disturbance to soils. If fill is required to be imported, this will need to be accompanied by a written report certifying the quality of the fill and where it comes from.

An unexpected finds protocol is recommended to be included in the Construction Environmental Management Plan to deal with any potentially contaminated soil encountered during excavation works.

8.4.2.2 Operational Works

Potential pollutants from use of the resource recovery facility are detailed in Section 8.3.7.

Potential impacts to soil from the proposed development and recommended safeguards are summarised in the table below.



Table 8-8: Potential Risks to Soil and Mitigation Measures

Potential Contaminant and Source	Potential Impact on Soil	Safeguards and Mitigation Measures
Loading and Unloading & external storage of materials – VENM, ENM, concrete, bricks and greenwaste/mulch.	Stormwater with elevated pH seeping into the ground	• Designated storage bays • Dust suppression system • External area capped with compacted roadbase reducing permeability of the ground surface
Diesel storage & refuelling spills and leaks	Stormwater contaminated with total recoverable hydrocarbons seeping into the ground	• Self bunded storage tank • Spill kits • External area capped with compacted roadbase reducing permeability of the ground surface
Vehicle washing	Overflow or incident at wash bay resulting in release of wastewater containing oil, grease, heavy metals and total suspended solids seeping into the ground	• Closed loop system • On-site water treatment and reuse • Bunded wash bay

The inert nature of the materials, and the safeguards designed into the development, there is expected to be negligible impacts from the proposed development on soil. There is expected to be negligible stormwater contamination into subsoils from the proposed activities with these limitations of the use of the site in place. An EMP for the management of the site will provide the detailed work practices.

8.4.3 Agricultural Resources

Important Agricultural Land is not currently mapped for the Hawkesbury Local Government Area. The site and surrounding properties are zoned RU1 – Primary Production. This indicates the land use is predominantly rural and many parcels of land would be used for agricultural purposes.

It is demonstrated throughout this EIS that impacts on surrounding land uses would be avoided and recommended control measures would adequately mitigate potential impacts associated with the proposed development.

8.4.4 Land Use Conflicts

A land use conflict risk assessment (LUCRA) is required for the proposed development. *The Department of Primary Industries Land Use Conflict Risk Assessment Guide* (2011) was used as guidance to undertake the risk assessment.

Land use conflicts can occur when one land user is perceived to trigger negative impacts on adjacent land uses. In rural areas land use conflicts can occur between agricultural and residential uses and between different agricultural activities or primary industries such as mining, forestry and aquaculture.



This LUCRA aims to:

- identify and address potential land use conflict issues and risk of occurrence strategies associated with the proposed development;
- assess the potential impacts of the proposed land use on neighbouring land uses; and
- if required, recommend strategies to help minimise the potential for land use conflicts to occur.

To achieve the aims listed, a four step approach was used:

1. Gathering of information including the site characteristics, nature of the proposed development and surrounding land uses.
2. Identification of potential land use conflicts associated with each proposed activity;
3. Identification of risk reduction management strategies that would either lower the probability of the event occurring or lower the consequences.
4. Evaluation of the level of risk using the risk ranking matrix with the management strategies in place and presentation of the results.

8.4.4.1 Gathering of Information

The site characteristics, nature of the proposed development and description of the surrounding land uses are described in detail throughout this report. A summary of the information is provided below.

8.4.4.1.1 Site Characteristics

The area of the site where the development would be located is a within a development (2ha) area in the centre of the site. The total land holding is a far greater area (15ha).

The north western portion of the site is currently used as an equestrian centre which would continue to operate. The south eastern portion of the site is well vegetated and this area would remain undisturbed.

More detailed information about the site location can be found in Sections 2 and 6.

8.4.4.1.2 Nature of Proposed Development

The proposed development involves the establishment of a landscaping supply and resource recovery facility dealing with inert waste products and using simple techniques to convert these into usable products.

8.4.4.1.3 Surrounding Land Uses

The site is located well over 1 km to the north east of the township of Wilberforce. Adjacent to the site is Arrosers Labrador Breeders to the south-west and Grange Growing Solutions, specialising in manufacture of horticultural and landscaping products is located further south-west of the site. An egg and chicken farm is located on Stannix Park Road. Other surrounding land uses are agricultural and rural.



8.4.4.2 Evaluation of Risk Level

8.4.4.2.1 Risk Criteria

The following defines the risk criteria used in this assessment.

The probability table allows for determining how likely an event is to occur. Likelihood is the chance that something might happen and is defined for the purposes of this assessment in the following table.

Table 8-9: Probability Table – to score the likelihood of the consequence occurring

Level	Descriptor	Description
A	Almost Certain	Common or repeating occurrence
B	Likely	Known to occur, or 'it has happened'
C	Possible	Could occur, or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically impossible

Source: *The Department of Primary Industries* (2011)

The measure of consequence involves the analysis of events to identify their potential on-site and off-site impacts and is described in terms of land use conflict in the following table.

Table 8-10: Measure of Consequence

Level	Descriptor	Description
1	Severe	- Severe and/or permanent damage to the environment - Irreversible - Severe impact on the community - Neighbours are in prolonged dispute and legal action involved
2	Major	- Serious and/or long-term impact to the environment - Long-term management implications - Serious impact on the community - Neighbours are in serious dispute
3	Moderate	- Moderate and/or medium-term impact to the environment and community - Some ongoing management implications - Neighbour disputes occur
4	Minor	- Minor and/or short-term impact to the environment and community - Can be effectively managed as part of normal operations - Infrequent disputes between neighbours
5	Negligible	- Very minor impact to the environment and community - Can be effectively managed as part of normal operations - Neighbour disputes unlikely

Source: *The Department of Primary Industries* (2011)



Each identified potential land use conflict is ranked based on the environmental, public health and amenity impacts according to the Risk Ranking Matrix shown in the following table.

Table 8-11: Risk Ranking Matrix

Probability	A	B	C	D	E
Consequence					
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

Source: *The Department of Primary Industries (2011)*

In the Department of Primary Industry's *Land Use Conflict Risk Assessment Guide (2011)*, the method of risk ranking is described as follows. (Note Table 3 refers to Table 8-9 in this report and Table 4 refers to Table 8-10):

The risk ranking matrix yields a risk ranking from 25 to 1. It covers each combination of five levels of 'probability' (a letter A to E as defined in Table 3) and 5 levels of 'consequence', (a number 1 to 5 as defined in Table 4) to identify the risk ranking of each impact. For example an activity with a 'probability' of D and a 'consequence' of 3 yields a risk rank of 9.

A rank of 25 is the highest magnitude of risk; a highly likely, very serious event. A rank of 1 represents the lowest magnitude or risk an almost impossible, very low consequence event. Priority is given to those activities listed as high risk. This will help rank multiple effects and provide a priority list when developing management strategies.

8.4.4.2.2 Identification of potential land use conflicts

Results of the initial risk evaluation are presented in Table 8-12.

Table 8-12: Initial Risk Evaluation

ID	Identified Potential Conflict	Source
1	Generation of dust and particulate matter impacting on neighbouring residences and the equestrian centre adjacent	Loading/Unloading of material Stockpiling Mulching Crushing & Screening
2	Excessive noise at nearby residences and the equestrian centre adjacent	Truck movements Loading/Unloading of material Stockpiling Use of Machinery and on-site vehicles



Table 8-12: Initial Risk Evaluation

ID	Identified Potential Conflict	Source
3	Spread of weed seed impacting on the adjacent vegetated area of the site and the equestrian centre adjacent.	Greenwaste stockpiles Mulching
4	Contamination of waterways as a result of release of contaminated stormwater runoff resulting in impacts to water users downstream	Loading/Unloading of material Stockpiling

8.4.4.3 Risk Reduction Management Strategies

Risk reduction management strategies have been identified for each event. These include the safeguards that would be designed into the facility and management measures that would be undertaken during operation. These are summarised in point form below:

- Establishment of a hardstand area of compacted roadbase with drainage to a silt arrestor and absorption pit;
- Dust suppression of external stockpiles through use of water sprayers;
- Incoming load inspection to ensure no unwanted wastes are accepted onto site;
- Initial water monitoring for potential pollutants; and
- Weed management practices.

8.4.4.4 Results

Risk was re-evaluated with risk reduction management strategies identified in place. Results are provided in Table 8-13.

Table 8-13: LUCRA Results

Identified Potential Conflict	Management Strategy (Method of Control)	Likelihood	Consequence	Risk Ranking
Generation of dust and particulate matter impacting on neighbouring residences and the adjacent equestrian centre	• Dust suppression • Hardstand area	D	4	5
Excessive noise at nearby residences and adjacent equestrian centre	• No night time truck movements or operations • Machinery operating within an enclosed building • Equestrian area of site separated from on-site vehicles by the building.	C	4	8
Spread of weed seed impacting on	• Incoming load inspections	D	3	9



Table 8-13: LUCRA Results

Identified Potential Conflict	Management Strategy (Method of Control)	Likelihood	Consequence	Risk Ranking
the adjacent vegetated land and the equestrian centre.	Weed management practices to be implemented	D	3	9
Contamination of waterways as a result of release of stormwater runoff resulting in impacts to water users downstream	- Stormwater runoff directed to a silt arrestor and absorption pit - Baseline water monitoring	D	4	5

All risk rankings were found to be 9 or below. Therefore, the potential for land use conflict is low.

8.5 FLORA AND FAUNA

The site consists mostly of cleared rural land and is used for rural purposes. The proposed development area is cleared with a scattering of established trees existing in the area. No threatened or endangered species or populations inhabit the site.

8.5.1 Biodiversity Development Assessment Report (BDAR)

A Biodiversity Development Assessment Report (BDAR) was undertaken by Narla Environmental Pty Ltd (Appendix 11). The assessment identified all potential impacts of the proposed development and the mitigation and management measures required to ensure biodiversity values are upheld. A summary of the findings from the BDAR is displayed below:

- The proposed development includes a resource management facility and its associated APZ (hereafter referred to as the 'Subject Land'), covering an area of approximately 1.55 ha. The proposed development has been purposefully designed to minimise impacts on biodiversity values, as it has been positioned within historically cleared land that contains scattered canopy trees. The Subject Land is currently used for grazing and contains low biodiversity values.
- The proposed development is expected to impact one (1) Plant Community Type (PCT): 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion. Six (6) ecosystem credits for PCT 1081 are offset in order to mitigate the impacts upon biodiversity as a result of the proposed development. No candidate species credit species will require offsetting.
- In order to avoid and minimise potential impacts of the proposal on local biodiversity values, a series of mitigation and management measures have been identified, which are to be implemented as part of any Construction Environmental Management Plan (CEMP) produced for the site. This includes assigning a Project Ecologist to undertake an extensive pre-clearing survey, and to supervise the clearing of all vegetation in relation to the proposed development.

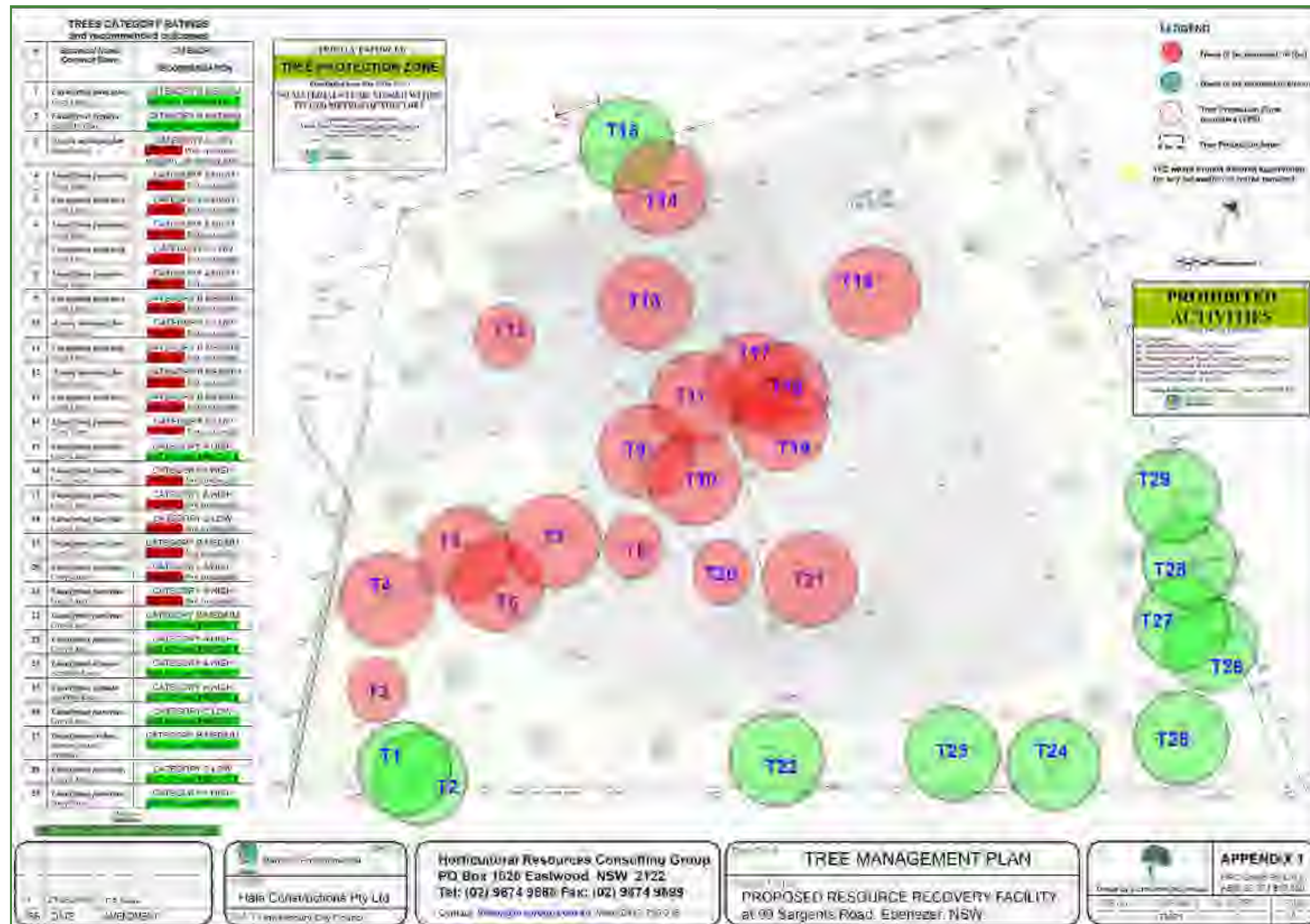


8.5.2 Arboricultural Implication Assessment

An arboricultural implication assessment was undertaken by Horticultural Resources Consulting Group (Appendix 10). The assessment found that the original vegetation of the area consisted of a shale/sandstone transitional forest with high sandstone influence. There are no endangered ecological communities (EEC) on the site and the site is not considered to be “urban bushland”.

The assessment identified trees planned for removal and trees to be retained on site. Figure 8-2 shows the tree management plan (including tree removal/retainment) pertaining to the proposed development.

Figure 8-2: Tree management plan





8.5.3 Biodiversity Value

The land is not biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*.

The Council has not been notified that the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*.

The land does not contain a set aside area under section 60ZC of the *Local Land Services Act 2013*.

The subject site is not identified as containing a critical habitat or biodiversity, but does contain an area of connectivity between significant vegetation according to the Terrestrial biodiversity map in the Hawkesbury LEP 2012. The area of land on the south of the proposed development area would not be disturbed. The remaining area has been previously disturbed and is already being used for rural purposes.

The NSW Government's Biodiversity Values Map does not identify anywhere on the site as an area of biodiversity significance, however along Currency Creek, 550 m north-west of the site the land is identified with high biodiversity value as defined by the *Biodiversity Conservation Regulation 2017*. This area would not be impacted by the proposed activities at the site.

8.5.4 Tree Removal

The proposed development will require approximately 18 trees to be removed. These are shown in the Landscape Plan in Appendix 9 and are identified in the Tree Management Plan in Figure 8-2 and Appendix 10. Trees located around the boundaries of the development area would remain. All existing trees and areas of native vegetation not identified for removal would be protected from damage during site works. The tree management plan details how trees will be managed during the planning and construction of the proposed facility.

8.5.5 Landscaping

A landscape plan is provided in Appendix 9. This shows the trees that would require removal and the location for proposed plantings of trees, screening shrubs, feature shrubs and groundcovers as part of the proposed development. The landscape plan has been certified by the Bushfire Consultant in relation to tree removal and required APZ zones.

8.5.6 Weed Management

The following is recommended to manage weeds at the site:

- Inspect incoming loads of greenwaste to ensure it is free of weed seeds.
- Stockpiles of greenwaste would be confined to material storage bays within the building or within the designated external storage bays.
- Planting only local native species or plants that do not have the potential to become invasive in accordance with the landscape plan.
- Regular monitoring (at least annually) of the site for weed infestations.
- Upon identification of weed species on site, seek expert advice for prompt treatment and control.
- No fertiliser use at the site.



- Consider alternate weed control techniques such as manual or hand removal, chipping / grubbing out, stem scraping and mechanical (brushcutter, slasher, bobcat, tractor) removal or weeds to avoid herbicide use at the site.

8.6 WASTE GENERATION AND MANAGEMENT

This section addresses the waste generation and management of the proposed development, together with a description of measures to avoid the generation of waste and to promote the re-use, recycling and re-processing of any wastes generated.

8.6.1 Relevant Legislation and Guidelines

The main legislation and guidelines that relate to waste management are:

- *Waste Classification Guidelines – Part 1: Classification of waste* (NSW EPA, 2014);
- *Protection of the Environment Operations Act 1997*;
- *Protection of the Environment Operations (Waste) Regulation 2014*; and
- *Waste Avoidance and Resource Recovery Act 2001*.

8.6.1.1 Waste Classification Guidelines

In the NSW EPA's *Waste Classification Guidelines* (2014), waste is described as:

- a) any substance whether solid, liquid or gaseous that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment; or*
- b) any discarded, rejected, unwanted, surplus or abandoned substance; or*
- c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, reprocessing, recovery or purification.*

All waste materials generated or received on the subject site must be classified into one of six different categories described the *Waste Classification Guidelines* (see table below).

Table 8-14: Classes of Waste from Waste Classification Guidelines

Class	Definitions / Examples
Special waste	• Clinical and related wastes; • Asbestos waste; • Waste tyres.
Liquid waste	• Waste that has an angle of repose <5 degrees; • Waste that becomes free flowing at or below 60°C; • Is not generally capable of being picked up by a spade or shovel.
Hazardous waste	• Waste with a pH ≤2 or ≥12.5; • Containers that have not been cleaned and contained dangerous goods within the meaning of the Transport of Dangerous Goods Code; • Lead-acid or nickel-cadmium batteries.
Restricted solid waste	• This type of waste is determined by chemical tests.



Table 8-14: Classes of Waste from Waste Classification Guidelines

Class	Definitions / Examples
General solid waste (putrescible)	- Waste from litter bins collected by local councils; - Animal waste and food waste; - Grit or screenings from sewage treatment systems that have been dewatered so that the grit of screenings do not contain free liquids.
General solid waste (non-putrescible)	- Paper or cardboard; - Glass, plastic, rubber, plasterboard, ceramic, bricks, concrete or metal; - Grit, sediment, litter and gross pollutants collected in, and removed from, stormwater treatment devices and/or stormwater management systems, that has been dewatered so that they do not contain free liquids

8.6.1.2 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the principal environmental protection legislation for NSW. The proposed facility is required to be licensed as resource recovery of general waste under Clause 34 of Schedule 1 of the POEO Act as the site will receive more than 6,000 tonnes of waste.

The POEO Act also establishes the ability to set various waste management requirements via the *Protection of the Environment Operations (Waste) Regulation 2014*.

8.6.1.3 Protection of the Environment Operations (Waste) Regulation 2014

The *Protection of the Environment Operations (Waste) Regulation 2014*, referred to as the 'Waste Regulation', identifies provisions relating to waste management and disposal. Specifically, it provides for contributions to be paid by occupiers of scheduled waste facilities for each tonne of waste received at the facility or generated in a particular area, exempts certain occupiers or types of waste from these contributions, and allows deductions to be claimed in relation to certain types of waste.

Part 4 of the Waste Regulation details the requirements associated with tracking waste. Certain types of waste listed in Schedule 1 of the Waste Regulation have the potential to be harmful to the environment and are required to be tracked from the source to the waste disposal facility. The proposed development is not expected to generate, receive, handle or process waste types that require tracking under the Waste Regulation.

This legislation also identifies other provisions relating to waste management and disposal including:

Record keeping for waste received at the facility

The occupier of a scheduled waste facility must record the following information in relation to each delivery of waste or other material received at the facility:



- the amount of any waste delivered, its waste type and its waste stream;
- the amount of any other material delivered and a description of the nature of that other material;
- the date and time the delivery is made; and
- the registration number of the vehicle used to make the delivery.

Record keeping for waste transported from the facility

The occupier of a scheduled waste facility must record the following information in relation to each load of waste or other material transported from the facility for use, recovery, recycling, processing or disposal at another place:

- the amount of any waste contained in the load, its waste type and its waste stream;
- the amount of any other material contained in the load and a description of the nature of that other material;
- the date and time the load is transported from the facility;
- the registration number of the vehicle used to transport the load;
- the name and address of the place to which the load is transported and the code or number of any environment protection licence for that place;
- the unique identification number in the case of waste or other material in the load that is removed from a stockpile required to have a unique identification number under clause 31 (1) (a); and
- details of any recycling, mixing, blending or processing of any waste in the load.

Record keeping for vehicles

The occupier of a scheduled waste facility must record the following particulars in relation to vehicles that enter the facility for a purpose related to the operation of the facility (whether or not the vehicle is being, or is intended to be, used to deliver or transport waste):

- the date and time on which the vehicle enters the facility;
- the date and time on which the vehicle leaves the facility;
- the registration number of the vehicle;
- the purpose of entry; and
- the weight of the vehicle.

Record keeping for waste stockpiled at facility

The occupier of a scheduled waste facility who is required to pay contributions under Section 88 of the POEO Act must record the following information in relation to any waste and any other material stockpiled at the facility:

- a unique identification number for each stockpile;
- the quantity of any waste (and its waste type) or other material held in each stockpile as at 30 June and 31 December of each year; and
- the quantity of any waste (and its waste type) or other material that is added to or removed from each stockpile each day.



Keeping, retention and availability of records

The occupier of a scheduled waste facility who is required to record information must:

- record and keep the information in accordance with any requirements of the Waste Levy Guidelines;
- ensure that each record is retained for at least 6 years after the record is made; and
- make any of the records available for inspection and copying by an authorised officer on request.

Measurement of waste: weighbridges

The occupier of a scheduled waste facility who is required to pay contributions under Section 88 of the POEO Act must ensure that there is a weighbridge installed at the waste facility and must:

- submit to the EPA, within 30 days after installing the weighbridge, a plan of the waste facility indicating the proposed vehicle flow controls, with the entry and exit points where waste is transported into and out of the waste facility (a vehicle flow control plan);
- keep a copy of the latest vehicle flow control plan on the premises and make the plan available for inspection and copying by an authorised officer on request;
- ensure that each vehicle that enters/leaves the waste facility for a purpose relating to the operation of the facility is weighed by the weighbridge on entering/leaving the facility;
- ensure that the weighbridge is verified (within the meaning of the *National Measurement Act 1960*) at least once a year;
- ensure that the weighbridge has related software that records quantities of waste in any form and manner specified in the Waste Levy Guidelines; and
- notify the EPA of any incident that results in the weighbridge being out of operation for any period of more than 24 hours.

The proposed development will have a verified weighbridge on site, for trucks entering the facility.

8.6.1.3.1 Waste Levy Guidelines 2015

The *Waste Levy Guidelines* (NSW EPA, 2015) contain specific legal requirements which occupiers of scheduled waste facilities must meet.

The POEO Act requires certain licensed waste facilities in NSW to pay a contribution for each tonne of waste received at the facility (referred to as the 'waste levy'), with the aims to reduce the amount of waste being landfilled and promote recycling and resource recovery.

Scheduled waste facilities are required to hold a levy liability on all waste received at the facility, which will be extinguished once the waste is transported back off site for lawful re-use or disposal. Payment of the levy is only triggered where:

- waste is stockpiled on-site for more than 12 months, unless the waste has been processed at the facility to a standard required by a resource recovery order;
- waste is stockpiled above lawful limits; and
- waste is transported for unlawful disposal.



8.6.1.4 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation. Among other miscellaneous provisions, the WARR Act sets out provisions for waste strategies and programs, and industry actions for waste reduction.

The company would follow the NSW EPA's hierarchy of waste management for the management of wastes generated as a result of its ongoing operations and during the construction phase, as most of the wastes generated are either reused on site or recycled offsite.

8.6.2 Waste Generation and Management

This section provided information on the expected quantity and types of waste to be generated or to be received, handled, processed and stored at the subject site, as well as wastes associated with the proposed development to be removed offsite. There are three stages of waste generation: demolition, construction and ongoing waste.

The following sections list and describe the expected wastes associated with each stage, as well as the waste management proposed. This information is similarly presented in the Waste Management Plan completed for Hawkesbury Council as a requirement of the DA process and is provided in Appendix 8.

8.6.2.1 Demolition Waste

The proposed development would be constructed on an area of the site which is currently vacant. Therefore no demolition waste would be generated.

8.6.2.2 Construction Waste

Construction of the proposed resource recovery facility will result in the generation of waste. The expected type, quantity and fate of these wastes are outlined in the following table.

Table 8-15: Construction Waste

Waste Type	Estimated Quantity Generated	EPA Waste Classification	Proposed Management
Bricks	0	General solid waste (non-putrescible)	N/A
Concrete	2 tonne	General solid waste (non-putrescible)	<u>Re-used onsite/recycled offsite</u> Concrete will be crushed and re-used as fill material. Residual concrete will be recycled offsite by a licensed waste recovery facility.



Table 8-15: Construction Waste

Waste Type	Estimated Quantity Generated	EPA Waste Classification	Proposed Management
Timber (Pallets, board finishes)	1 tonne	General solid waste (non-putrescible)	<u>Recycled offsite</u> Timber will be sent offsite for recycling to landscaping suppliers and composting facilities.
Plasterboard	0.5 tonne	General solid waste (non-putrescible)	<u>Recycled offsite</u> To be re-used or recycled offsite by recycling facility.
Scrap Metal	0.5 tonne	General solid waste (non-putrescible)	<u>Recycled offsite</u> To be re-used or recycled offsite by recycling facility.
Other wastes (Electrical fittings, PVC Plastic, etc.)	0.25 tonne	<i>Expected to be</i> General solid waste (non-putrescible)	<u>Recycled offsite/Landfill</u> To be re-used or recycled offsite where possible, otherwise sent to landfill for disposal.
Greenwaste (from tree removal)	20 m ³	General solid waste (Putrescible)	<u>Reused on site</u> Mulched on site for landscaping purposes

All expected wastes generated during construction works to be undertaken at the subject site will be either re-used on site or recycled/re-used offsite at licensed waste management facilities. Waste would be segregated on site into stockpiles for excavated material and green waste, and into designated industrial sized waste bins for all other materials.

8.6.2.2.1 *Unexpected Finds Protocol*

An *unexpected finds protocol* would provide instruction on what to do in the event that suspect materials identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos, ash material etc. are encountered during any stage of earthworks, site preparation and construction. Works would cease immediately and temporary barricades set up to prevent access to the area. Erosion and sediment controls would need to be installed around the area. Inspection of the suspect material by a suitably qualified person followed by laboratory testing and analysis (if deemed required) would identify the nature of the material and the extent (if any) of remediation that is required.

8.6.2.3 **Recovered Waste**

‘Waste’ material is the incoming material processed on site to produce recoverable material. This section presents the expected type, quantity, onsite management and offsite destination of wastes associated with site operations. The estimated maximum quantity is a gross estimation



based averages of C&D waste generated in NSW. The quantity for each waste type may vary significantly depending on the source that generated the waste.

Two tables are provided and include details of incoming waste (waste accepted at the site for processing) and waste generation (waste generated from the processing and separation of waste on site).

Table 8-16: Incoming Waste Types, Quantities and Management

Waste Type	Estimated Incoming Quantity	Waste Classification	Management
Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM)	9,000 tonnes per year	General Waste (Non-putrescible)	This waste is the raw material used in the resource recovery process.
Concrete and bricks	9,000 tonnes per year	General Waste (Non-putrescible)	
Greenwaste	2,000 tonnes per year	General Waste (Non-putrescible)	

Table 8-17: Recovered Material Types, Quantities and Management

Recovered Material	Estimated Maximum Quantity ²	EPA Waste Classification ¹	Destination
Topsoil	8,800 tonnes per year	General soil waste (non-putrescible)	All recovered materials would be sold as landscaping material supplies (in bulk). No public sales.
Aggregate	8,800 tonnes per year	General solid waste (non-putrescible)	
Mulch	2,000 tonnes per year	General solid waste (non-putrescible)	

Notes:

1. Waste classification according to *Waste Classification Guidelines* provided.
2. A minor quantity of this material will end up as waste that cannot be recovered.



8.6.2.4 On-going Waste

Some waste will be generated from the office activities and unavoidable wastes that are brought on site that are not able to be processed. An incoming waste inspection would be implemented to prevent any hazardous materials such as asbestos being brought onto site and to minimise the quantity of waste that cannot be processed on site.

It is difficult to quantify residual waste that may be generated. The following table provides estimated quantities of waste that may be generated at the site.

Figure 8-3: On-going Waste

Waste Type	Estimated Quantity Generated	EPA Waste Classification	Proposed Management
General waste from office and amenities (including kitchen scraps)	6 tonnes per year	General solid waste (putrescible)	<u>Disposed offsite</u> Stored in a designated general waste bin and collected by a waste contractor.
Recyclable general waste from office and amenities	4 tonnes per year	General solid waste (non-putrescible)	<u>Recycled offsite</u> Stored in a designated recycling waste bins and collected for recycling by a waste contractor.
Residual general waste	400 tonnes per year	Expected to be General solid waste (non-putrescible)	Residual C&D waste that cannot be recovered from the sorting process would be placed in a designated storage bay, until collection by a licensed waste contractor for final disposal offsite.
Wash Bay residual waste	2 tonnes per year	Liquid waste	Residual waste from the wash bay may be generated from time to time. Any sediment removed during regular maintenance would be removed periodically by a licensed waste contractor for final disposal offsite.

A waste management plan is provided at Appendix 8.

8.6.2.4.1 Incoming Waste Inspection

The company's EMP would include an *incoming waste procedure*, developed to confirm the type of C&D wastes arriving on site and to deal with any unexpected or non-conforming wastes (e.g. hazardous wastes like asbestos) mixed with accepted waste types. The *incoming waste procedure* would be prepared in accordance with the EPA's guidelines:

- "Draft Protocol for managing asbestos during resource recovery of construction and demolition waste" (NSW EPA, 2014); and
- "Consultation Paper: New minimum standards for managing construction and demolition waste in NSW" (NSW EPA, 2016).



The *incoming waste procedure* would need to be implemented from the first load accepted at the facility. All staff involved in the acceptance of waste at the site would need to be trained in this and all other environmental procedures detailed in the EMP.

8.6.3 Waste Avoidance and Resource Recovery

As described previously, the facility recycles non-production recyclable waste and it is in the nature of the development to avoid waste and recover resources because VENM, ENM, concrete, bricks and greenwaste will be processed for reuse at the site that might otherwise go to landfill.

8.6.4 Waste Storage

Waste (incoming and recovered materials) would be stored within designated storage bays shown on site plans. There would be eight (8) bays external to the building and eight (8) bays within the building.

The maximum waste storage on site is expected to be up to 3,000 tonnes at any one time.

One skip bin is expected to be required for unrecoverable wastes from the process. Wheelie bins would be provided for office waste.

8.7 HAZARDS AND RISKS

This section presents the hazards and risks associated with the proposed development.

8.7.1 Chemicals and Dangerous Goods Storage

The site will store LPG, diesel and truck wash. Details of use and quantities are shown in the following table:

Table 8-18: Chemical Storage

Product Name	Un No.	ADG/ GHS	GHS Signal Word	Quantity Storage Capacity	Storage Type	Storage Location
Liquefied Petroleum Gas	1075	ADG: Class 2.1/ GHS Flammable gases: Category 1 gases under pressure: Liquefied gas	Danger	45 Kg	2 Cylinders	Chained in front of shed
Diesel	1202	ADG: Non dangerous goods, C1 combustible liquid under AS1940-2017 GHS: Category 4 flammable		3000 L	Self bunded tank	External to building on hardstand area
Truck Wash	-	ADG: Non-dangerous good/ GHS: Non-hazardous good	-	200 L	1 Drum	Bunded area



8.7.2 Preliminary Risk Screening

Details of Dangerous Goods (DG Code) and/or Hazardous Chemicals (GHS Classification) typically used and stored on site, with current and proposed storage quantities and annual usage quantities, have been provided in Table 8-19. Safety Data Sheets (SDS) of all the listed chemicals are available on request.

The only dangerous goods to be stored on site are 2 cylinders of LPG, ADG Class 2.1, stored in chains and 3000 L of diesel, ADG Class C1 within a self bunded diesel tank.

Chemical management requires a site to comply with the requirements of the *Work, Health and Safety Regulation 2017*. Notification to SafeWork Australia is not required as chemical quantities do not exceed the manifest quantities.

Requirements in Australian Standards also need to be applied when a site stores more than minor quantities of a hazardous substance/chemical belonging to one of the nine Classes of Dangerous Goods. The basis of chemical management safeguards for some of these classes are described in the following Australian Standards:

- AS 1940–2017 *The storage and handling of flammable and combustible liquids*;
- AS/NZS 1596:2014 *The storage and handling of LP Gas*; and
- AS 4332–2004 *The storage and handling of gases in cylinders*.

Storage of all hazardous chemicals would comply with the above standards. General controls that need to be met for adequate chemical management at the site are as follows:

- Storage of LPG cylinders outside the building, inside a lockable cage, in accordance with AS/NZS 1596:2014;
- Provision of adequate fire protection services;
- Provision of spill kits near diesel storage area;
- Site securely locked when not in operation;
- Up to date environmental and safety management procedures and systems; and
- Personnel regularly trained and competency tested in matters regarding the use of firefighting equipment.

A preliminary risk screening of the proposed development in accordance with *State Environment Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) has been undertaken, with results provided below. The quantities of dangerous goods do not exceed the threshold quantities for applying SEPP 33. Therefore, a Preliminary Hazard Analysis (PHA) is not required.

Table 8-19: SEPP 33 Preliminary Risk Screening

Class	Screening Threshold	Description	Site Specific Description	Quantity to be stored	Triggers SEPP 33
Class 1.2	5 tonne	Explosives	None	None	No
Class 1.3	10 tonne	Explosives	None	None	No



Table 8-19: SEPP 33 Preliminary Risk Screening

Class	Screening Threshold	Description	Site Specific Description	Quantity to be stored	Triggers SEPP 33
Class 2.1	10 tonne or 16 m ³ if stored above ground 40 tonnes or 64 m ³ if stored underground or mounded	Flammable Gases	Category 1 Liquid Petroleum Gas Chained in storage	2 cylinders 45 kg	No
Class 2.2	Not Relevant	Non-flammable, non-toxic gases	None	None	Not relevant
Combustible Liquid C1	Not relevant	Combustible liquid with flashpoint of 150°C or less	Diesel	3,000 L	Not Applicable
Combustible Liquid C2	Not relevant	Combustible liquid with flashpoint exceeding 150°C	None	None	Not Applicable
Class 2.3	5 tonne	Anhydrous ammonia	None	None	No
	1 tonne	Chlorine and sulphur dioxide stored as liquefied gas in contains <100 kg	None	None	No
	2.5 tonne	Chlorine and sulphur dioxide stored as liquefied gas in containers >100 kg	None	None	No
	100 kg	Liquefied gas kept in or on premises	None	None	No
	100 kg	Other toxic gases	None	None	No
Class 3	Assessed by reference to figures 8 & 9 of applying SEPP 33	Flammable liquids PG I, II and III	None	None	No
Class 4.1	5 tonne	Flammable Solids	None	None	No
Class 4.2	1 tonne	Substances liable to spontaneous combustion	None	None	No
Class 4.3	1 tonne	Substances which, in contact with water, emit flammable gases	None	None	No
Class 5.1	25 tonne	Ammonium nitrate – high density fertiliser grade	None	None	No



Table 8-19: SEPP 33 Preliminary Risk Screening

Class	Screening Threshold	Description	Site Specific Description	Quantity to be stored	Triggers SEPP 33
Class 5.1	5 tonne	Oxidising substances	None	None	No
Class 5.1	2.5 tonne	Dry pool chlorine – in containers <30 kg	None	None	No
Class 5.1	1 tonne	Dry pool chlorine – in containers >30 kg	None	None	No
Class 5.1	5 tonne	Any other Class 5.1	None	None	No
Class 5.2	10 tonne	Organic peroxides	None	None	No
Class 6.1 PGI	0.5 tonne	Toxic substances	None	None	No
Class 6.1 PGII & III	2.5 tonne	Toxic substances	None	None	No
Class 6.2	0.5 tonne	Infectious substances	None	None	No
Class 7	All	Radioactive Material	None	None	No
Class 8 PGI	5 tonne	Corrosive substance	None	None	No
Class 8 PGII	25 tonne	Corrosive substance	None	None	No
Class 8 PGIII	50 tonne	Corrosive substance	None	None	No

8.7.3 Fire

NSW FR - Fire Safety Guideline – Fire Safety in Waste Facilities 2020 is not considered applicable to this development as minimal combustible waste will be received on site and all wood will be stored externally.

Fire risk is assessed in this section.

8.7.3.1 Fire Protection

The facility will require fire fighting equipment to be installed including fire hydrants, hose reels and extinguishers.

The fire extinguishers are to be checked and serviced every six months and maintained in accordance with the requirements of the Environmental Planning and Assessment Regulation 2000.

The fire engineers will need to be engaged to enable the requirements of the fire services for the site to be advised. This would need to occur prior to release of the construction certificate



8.7.3.2 Fire Risk Assessment

8.7.3.2.1 Methodology

The methodology described in the following sections was used in assessing the fire risks associated with site activities. A qualitative method was used and a review was conducted to determine whether a quantitative assessment was required.

8.7.3.2.2 Hazard Identification

Hazard identification is the first step in the risk assessment. It involves the identification of all possible hazardous events required for further quantification and analysis. This does not, in any way, imply that the hazard identified or its possible impact will occur in practice.

To identify hazards, a survey of operations was carried out to isolate the events which are outside normal operating conditions and which have the potential to impact outside the boundaries of the site. In accordance with the NSW Department of Planning's Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 – *Guidelines for Hazard Analysis*, these events do not include occurrences that are a normal part of the operational cycles of the site but rather the atypical and abnormal, such as the occurrence of a significant liquid spill during product transfer operations.

8.7.3.2.3 Risk Criteria

The following sub-section defines the risk criteria used in this assessment.

8.7.3.2.4 Consequence Estimation

This aspect involves the analysis of events carried forward from the hazard identification process in order to quantify their potential on-site and off-site impacts. In this case, these events typically include fire and the potential effects on people, the environment, damage to property and the financial loss as a result of this damage.

Categories of consequences have been defined in terms of environmental, health and financial impacts and are described in the following table.



Table 8-20: Consequence Table

Level	Descriptor	Consequences Or Impact Description
1	Insignificant	Confined on-site environmental impacts able to be promptly rectified. No injuries. Financial loss less than \$2,000.
2	Minor	Confined environmental impacts requiring short term recovery with potentially little or no off-site impacts. First Aid treatment. Financial loss \$2,000 to \$20,000.
3	Moderate	Confined environmental impacts requiring medium term recovery both on-site and off-site. Medical treatment required. Financial loss \$20,000 to \$200,000,
4	Severe	Unconfined environmental impacts requiring long term recovery and leaving residual damage both on-site and off-site. Extensive injuries, loss of product capability. Financial loss \$200,000 to \$1M.
5	Catastrophic	Widespread environmental impact requiring long term recovery and leaving major damage both on-site and off-site. Death. Financial loss more than \$1M.

8.7.3.2.5 Likelihood Estimation

This aspect involves determining how likely an event is to occur. Likelihood is the chance that something might happen and is defined for the purposes of this assessment in the following table.

Table 8-21: Likelihood Table

Level	Descriptor	Likelihood Description
A	Almost Certain	Very likely. The event is expected to occur in most circumstances.
B	Likely	Strong possibility. The event will probably occur in most circumstances.
C	Possible	The event might occur at some time.
D	Unlikely	Not expected. There is a slight possibility the event could occur at some time.
E	Rare	Highly unlikely. The event may occur only in exceptional circumstances.



8.7.3.2.6 Level of Risk

The level of risk is defined by the following table.

Table 8-22: Level of Risk Table

		Consequence				
		Insignificant 1	Minor 2	Moderate 3	Severe 4	Catastrophic 5
Likelihood	A (almost certain)	III	II	I	I	I
	B (likely)	III	II	I	I	I
	C (possible)	III	II	II	I	I
	D (unlikely)	III	III	II	II	II
	E (rare)	III	III	III	II	II

The Class I area, shown in red, indicates a high level of risk which is intolerable and where risk reduction is required. This requires the reduction of the likelihood and/or the consequence.

The Class II area, shown in yellow, indicates a moderate level of risk. Whilst the risk is not unacceptable, there should be practical measures taken to lower the risk if economically viable. For risks where further mitigation is not economically viable, judgment needs to be exercised as to whether the level of risk is acceptable or not. This class is the beginning of the "As Low as Reasonably Practicable" (ALARP) region which means that while risk of an accident may be tolerable, steps still need to be taken to reduce the risk level to as low as reasonably practicable. A risk that satisfies ALARP would be considered acceptable.

The Class III area, shown in green, indicates a low level of risk and is broadly considered to be acceptable. Further risk mitigation may not be required/appropriate. However, low and accepted risks should be monitored and routinely reviewed to ensure that they remain acceptable. Few risks remain static. This class includes ALARP as well as what are known as trivial or negligible risks.

8.7.3.2.7 Risk Characterisation and Identification

8.7.3.2.7.1 Identification of Hazards

HB 203-2012: Managing Environment-Related Risk defines a **risk source** as "a tangible or intangible element that alone or in combination has the intrinsic potential to give rise to risk. It is thus an encompassing term that includes the terms 'hazard' (a source of potential harm) and 'environmental aspect'."

An **environmental aspect** could be a "licensed discharge or emission, waste, or the consumption or reuse of a material. They could also involve noise, odour, light or vibration."



The process of identifying hazards associated with site activities was to firstly carry out a review of the proposed site operations. The next step was a brainstorming session with a team of consultants to systematically break down each step in the process and to identify environmental aspects and, therefore, potential hazards associated with each activity. The results of this process are presented in Table 8-23.

Table 8-23: Identification of Hazards

Risk Source / Activity	Hazards
PROCESS: Unloading and Storage	
Unloading of building waste materials into storage bays	Dust
On-site traffic movements	Vehicle leakages of oil and fuel
Storage of materials in storage bays	Fire in stockpiles (including timber stockpile)
PROCESS: Sorting Using Excavator and Loader	
Excavator and Loader moving material	Vehicle leakages of oil and fuel
PROCESS: Crushing/Screening of Concrete Bricks	
Crushing and Screening of Concrete, Bricks	Dust
PROCESS: Chemical Use and Storage	
Refilling of diesel fuel tank	Spillages of diesel fuel
Storage of diesel fuel	Spillages of diesel fuel
On-site refuelling of mobile equipment	Spillages of diesel fuel
Storage of LPG	Explosion/Fire
Storage of Lubricant Oil	Spillages of lubricant oil
Onsite use of lubricant oil for machinery	Spillages of lubricant oil
PROCESS: General Plant Activities	
Use of wash bay	Spillage of wash water
Car parking and yard areas	Leakages of oil and fuel
Use of water mist for dust suppression	Failure of the dust suppression system
NATURAL DISASTERS	
Fire	Fire from offsite or onsite sources causing damage to property, human health and/or air pollution.

Analysis of the risks associated with the hazards identified above is presented in Section 8.7.3.2.8.

8.7.3.2.8 Risk Analysis

The risk analysis was undertaken using the hazard identification table and the risk criteria established in Section 8.7.3.2.3. Risk assessment was undertaken firstly based on the site activities with no safeguards in place to determine the Existing Risk Rating. The residual risk rating is the risk re-assessed with safeguards in place.

The results are presented as a Hazard and Risk Register in Table 8-24.



Table 8-24: Fire – Risk Register

Event Number	Hazard	Event/Causes	Consequences	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Prevention & Mitigation Safeguards	Residual Consequence	Residual Likelihood	Residual Risk Rating	Meet ALARP?
1	Fire	Fuel leak (e.g.: LPG, Diesel or Lubricant Oil)	- Release of toxic products of combustion - Damage to vehicle and/or property - Missiles (i.e. LPG cylinders) - Rupturing of containers and contaminated fire water runoff	Severe	Unlikely	II	NO	Enclosed chemical containers; Spill kits, spill kit training; Fire protection equipment; Smoke detectors; Emergency plan; No smoking policy; Control of ignition sources; Firefighting equipment training; Regular plant inspections; Preventative maintenance schedule; Bunding conforms to AS 1940; Fire rated wall between LPG and diesel storage; Environmental awareness training.	Moderate	Rare	III	YES
2		Fire in stockpile (including timber fire)		Severe	Unlikely	II	YES	Water sprays for dust suppression; Fire protection equipment; Smoke detectors; Emergency plan; No smoking policy; Control of ignition sources; Firefighting equipment training; Preventative maintenance schedule; Environmental awareness training.	Severe	Rare	III	YES



Table 8-24: Fire – Risk Register

Event Number	Hazard	Event/Causes	Consequences	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Prevention & Mitigation Safeguards	Residual Consequence	Residual Likelihood	Residual Risk Rating	Meet ALARP?
3		Wood stockpile spontaneous combustion		Severe	Rare	II	YES	Water sprays for dust suppression, Fire protection equipment; Smoke detectors; Emergency plan; No smoking policy; Control of ignition sources; Firefighting equipment training; Inspect timber stockpile for signs of combustion.	Severe	Rare	III	YES
4		Lightning strike		Minor	Possible	II	YES	Fire protection equipment; Smoke detectors; Emergency plan; Firefighting equipment training; Earthing (grounding) system for the building; Preventative maintenance schedule.	Minor	Possible	III	YES
5		Adjacent property fires		Severe	Unlikely	II	YES	Fire protection equipment; Smoke detectors; Emergency plan; Firefighting equipment training; Enclosed chemical containers; Bunding conforms to AS 1940;	Severe	Unlikely	III	YES



Table 8-24: Fire – Risk Register

Event Number	Hazard	Event/Causes	Consequences	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Prevention & Mitigation Safeguards	Residual Consequence	Residual Likelihood	Residual Risk Rating	Meet ALARP?
6		Arson		Severe	Unlikely	II	YES	Fire protection equipment; Smoke detectors; Emergency plan; Firefighting equipment training; Security: Fully fenced site and locked gates during afterhours.	Severe	Unlikely	III	YES
7		Smoking		Severe	Possible	I	NO	Fire protection equipment; Smoke detectors; Emergency plan; No smoking policy; Firefighting equipment training; Preventative maintenance schedule; Environmental awareness training.	Severe	Unlikely	III	YES
8		Appliance fire Broken fluorescent light		Severe	Unlikely	II	YES	Fire protection equipment; Smoke detectors; Emergency plan; No smoking policy; Control of ignition sources; Firefighting equipment training.	Severe	Unlikely	III	YES



8.7.3.3 Assessment of Fire Threat

With mitigation and safeguards in place, the fire threat is low.

8.7.3.4 Bushfire Hazard

A Bushfire assessment was undertaken by Bushfire Consulting Services and is displayed as Appendix 7.

The subject site is “bushfire prone land” under Hawkesbury LEP bushfire prone land map. Therefore, a bushfire assessment was undertaken to determine whether the development will be protected from the likely bushfire threat. A summary of the findings is provided below.

The bushfire assessment was undertaken in accordance with requirements in *Planning for Bush Fire Protection 2006*.

The proposed building classification under the Building code of Australia (BCA) is Class 5 being an office, Class 7a being a carpark, Class 7b being a warehouse and Class 10B being a weighbridge, wash bay and retaining walls.

A site inspection was carried out on 16 May 2019. The proposal was found to comply with the aims and objectives of the Planning for Bush Fire Protection 2006 and the recommendations for bushfire measures are summarised as follows:

1. Asset Protection Zones: The lot shall be managed as an IPA APZ from the warehouse for a distance of 29m to the northeast, 36m to the southeast and 24m to the southwest and northwest, as outlined in PBP 2019 Appendix 4.
2. A 20,000 litre static water supply is to be available for fire fighting purposes and suitable fittings sufficient to enable fire fighting. The tank is to be concrete or metal and all exposed water pipes external to the building are metal, including any fittings. A static water supply marker should be obtained from the Rural Fire Service and displayed in a prominent position at the front gate.
3. Where practicable, electrical transmission lines are underground.

If applicable, reticulated or bottled gas is installed and maintained in accordance with

- AS/NZS 1596:2014 – The storage and handling of LP Gas
- The requirements of relevant authorities
- Metal piping is used
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side
- Connections to and from gas cylinders are metal
- Polymer-sheathed flexible gas supply lines are not used
- And above ground gas service pipes are metal, including and up to any outlets.



4. Wherever possible, the storage of hazardous materials will be away from the hazard.
5. The need to formulate an emergency evacuation plan is suggested. To do so, occupants can complete a Bush Fire Safety Plan on the NSW RFS website.

The development would satisfy the aims and objectives of Planning for Bush Fire Protection 2006 relevant to the development type with the addition of an APZ required by Council.

8.7.4 Incident Management

An emergency and pollution incident response management plan is required and is described in Section 12.2.1



9. SOCIAL IMPACTS AND SAFEGUARDS

This section addresses the most significant social impacts that could result from the proposed development, which are human health and traffic issues. Visual impacts and heritage are also discussed briefly.

9.1 HUMAN HEALTH

Potential health impacts from the proposed development have been assessed with reference to the *Health Impact Assessment Guidelines* (enHealth, 2001). Identified issues concerning human health are related to the following operational aspects: generation of inhalable and respirable dust (including silica dust), potential receipt of asbestos waste within building waste, high internal noise levels and harmful consequences of a potential fire or chemical spill incident occurring on site.

9.1.1 Generation of Dust

The generation of particulate matter in the form of inhalable and/or respirable dust (including silica dust) can cause health impacts to workers who are exposed to the airborne contaminants, either at high levels or for prolonged periods of time. Potential health effects include irritation to upper and lower respiratory tract and detrimental impacts to pulmonary function. Control practices that will be in place to minimise the risk of exposure to employees include the use of appropriate PPE (see Section 9.1.5), as well as workplace housekeeping practices.

Potential health impacts associated with external release of dust are considered to be low based on the results from the Air Quality Impact Assessment (Appendix 1), which show that levels of particulate matter at nearest sensitive receptors are expected to be below the Approved Methods environmental criteria which is well below the occupational exposure limits.

9.1.2 Asbestos Waste

The proposed development would receive demolition and construction waste (general solid waste non-putrescible), however occasional other waste types like Hazardous waste may enter the subject site; in the case of asbestos containing material being found within the loads accepted at the proposed facility.

Asbestos can cause asbestosis, lung cancer and mesothelioma. Asbestos is a risk when asbestos fibres become airborne. Therefore it is critical the site's EMP include an *incoming waste procedure*, developed to confirm the type of C&D wastes arriving on site and to deal with any unexpected or non-conforming wastes (e.g. hazardous wastes like asbestos) mixed with accepted waste types. The suspect material would need to be segregated from other material using temporary barricades. Inspection by suitably qualified person and possible laboratory testing undertaken to determine the nature of the material and any remediation required. The incoming waste procedure in the EMP would need to be implemented from the first load accepted at the facility. The staff would need to be trained in this and all other environmental procedures in accordance with Draft Protocol for managing asbestos during resource recovery of construction and demolition waste" (NSW EPA, 2014) detailed in the EMP.



9.1.3 Generation of Noise

High internal noise levels can potentially cause health impacts (e.g. hearing loss) to workers who are exposed to it on a daily basis. Control practices that will be in place to minimise the risk of exposure to employees include the use of appropriate PPE (see Section 9.1.5) and undertaking systematic equipment maintenance.

Potential health impacts associated with external environmental noise are considered to be low based on the results from the Noise Impact Assessment (Appendix 2), which show that noise impacts at nearest sensitive receptors are expected to comply with the relevant environmental criteria, which is well below the occupational exposure limits.

9.1.4 Fire and Chemical Spill Risk

One of the main concerns to human health resulting from a potential fire on site is inhalation of smoke and other air pollutants. Fire related issues are addressed in detail in Section 8.7.3, where appropriate control measures have been recommended. With adequate fire services and equipment in place the risk of a fire occurring on site is considered to be low.

Potential adverse impacts to health could also result from unintended human contact with hazardous chemicals, upon their accidental release within the building and/or externally to the site, through their release into the stormwater system. The possibility of such an event occurring is considered to be low and a number of safeguards are in place to reduce the risk of any material spill. Any chemicals will be safely stored in accordance with the relevant Australian Standard. Bunding for storage of diesel and spill clean-up equipment is available on site to contain and clean up potential chemical spills should these occur. Only minor quantities of chemicals would be stored – diesel, lubricants, grease, cleaning.

Therefore, the potential health impacts from the accidental release of hazardous chemicals are considered to be minor for on-site workers and further insignificant for the local community.

9.1.5 Employee Health and Safety

All employees would undergo appropriate training as part of site induction and be provided with appropriate Personal Protective Equipment (PPE) for their role, such as ear plugs, dust masks, high visibility clothing and safety boots. The employer would ensure the operation is conducted as approved and appropriate resources are available for work safety. The proposed development would be required to comply with the following Acts and Regulations relating to health and safety:

- Work Health & Safety Act 2011; and
- Work Health & Safety Regulations 2017.

Employees would need to be trained in the appropriate safety procedures applicable to their role, including training in the use of firefighting equipment.



9.2 VISUAL IMPACTS

The site is located in a rural area. The development area would occupy approximately 2 hectares of the 15 hectare site. The development area would require cut and fill works to provide a platform for the infrastructure and would consist of a new 2,000 sqm industrial Colorbond warehouse and 131 sqm office building. External storage bays with sides up to 4 metres in height would occupy 527 sqm. A 27 space car park would be located set back from the site frontage and a weighbridge would be located adjacent to the storage bays with access from the southern side of the site. The site layout has been designed in a way that the views of the site from the existing tenants would be of the new warehouse and car park. Landscaping along the north western boundary of the development area would minimise views of the development.

The site is surrounded by dense vegetation to the north, east and south and is shielded from view from outside the site boundaries in these directions.

The site is located at substantial separation distances to nearest receptors. It is unlikely the development would be clearly seen from any residence located near the site due to topography. Existing vegetation at the frontage to the site along Sargents Road would be maintained and additional plantings along the site frontage and along the north western boundary of the development area are proposed.

9.2.1 Building Height

The proposed processing and storage building is considered to be consistent with the design of a large rural shed. The height of the building to the peak of the roof would be 12.8 m with the side walls being 7 m in height. The building height exceeds the 'height of buildings' standard under Clause 4.3 of the Hawkesbury LEP 2012 which for the land zoning is a maximum of 10 metres.

The new building would be constructed on a platform established from cut and fill works that would have an AHD of 20 m. The site frontage would be above AHD 23 metres, as shown on the site plans and elevations. At viewpoints from any direction, the new infrastructure would not have a significant impact on the visual amenity of the existing site due to site's topography and the location of the proposed building. The nearest resident with the most potential for views of the site is located approximately 100 m to the west of the development area. The development is unlikely to be seen from this viewpoint.

The proposed development contravenes the building height. Under Clause 4.3 of the Hawkesbury LEP 2012, buildings should be no higher than 10 m, however, the proposed building heights are 12.8 m.

An application in writing to justify this contravention to the standard would be made to Council.

Therefore, there is expected to be no reduction in visual amenity to the residences and businesses in the surrounding areas.



9.3 HERITAGE

A search for heritage places and items was conducted via the OE&H State Heritage Inventory, an online heritage database which includes listings from Aboriginal Places, State Heritage Register, Interim Heritage Orders, State Agency Heritage Registers and Local Environmental Plans.

The subject land was found not to be affected by an Interim Heritage Order under the provisions of the NSW *Heritage Act 1977*. No Aboriginal Places or European heritage locations have been identified or uncovered on the subject site or in its vicinity.

The site is also not listed as being a heritage item or containing items under the Hawkesbury LEP 2012.

The nearest general heritage items to the site are 'Kinlew' adjacent to the site's southern border at 477 Sackville Road, 'Coromandel' 400 m to the north at 665 Sackville Road, and 'Stannix Park' 700 m to the north at 103 Stannix Park Lane. Stannix Park is also listed as 'Stannix Park House, cattle tanks and site' under the State Heritage Act.

2.5 km south-east of the site is Cattai Estate listed under the State Heritage Act. Within this area 'Hope Farm House', 'Hope Farm Cottage' and the outbuilding and mill are listed as General Heritage Items under the Hills Local Environmental Plan 2012. Hope Farm Windmill, Hope Farm Mill Granary and Stockmans Cottage foundations in this area are listed as Archaeological Items.

The proposed development will not impact the surrounding heritage items.



Figure 9-1: Heritage Map





9.4 ROAD, TRAFFIC AND TRANSPORT

This section provides details regarding road, traffic, transport, access and parking as a result of the proposed development.

9.4.1 Traffic and Parking Impact Assessment

A Traffic and Parking Impact Assessment for the proposed development was undertaken by ML Traffic Engineers. A summary of the findings is provided below. The full report is contained within Appendix 5.

9.4.1.1 Existing Traffic Volume and Intersection Assessment

An intersection analysis was undertaken on the existing intersection performance for the following intersections:

- Priority intersection of Stannix Park Road with Sargents Road;
- Priority intersection of Sackville Road with Stannix Park Road; and
- Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road.

Intersection modelling using SIDRA, an industry standard intersection assessment software, was undertaken. Traffic counts at the intersections for the weekday AM and PM peak hour periods 8:00am to 9:00am and 5:00pm to 6:00pm were conducted and the existing intersection operating performance was assessed to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. LoS is allocated a level between A, meaning good operation, to F, meaning unsatisfactory.

Results found that all intersections have LoS A for both AM and PM peak hours and have spare capacity. All intersections assessed perform well under existing conditions.

9.4.1.2 Traffic Generation

Traffic generation for the proposed development has been determined based on the annual tonnage of 20,000 tonnes per year and operation of the site 6 days per week. Material would be transported in trucks ranging from 23 to 48 tonnes in size.

The following calculations are provided:

23 tonne trucks

Average loads and truck movements using 23 tonne trucks for all loads.

Incoming Materials:	20,000/23 =	869.6	Trucks p/a
Outgoing Materials:	20,000/23 =	869.6	Trucks p/a
Totals		1,739.2	Trucks p/a



48 tonne trucks

Average loads and truck movements using 48 tonne trucks for all loads.

Incoming Materials:	20,000/48 =	416.7	Trucks p/a
Outgoing Materials:	20,000/48 =	416.7	Trucks p/a
Totals		833.4	Trucks p/a

Average annual truck trips

Using 23 tonne trucks:	1,739.2 trucks per year / 312 =	5.57 trucks per day
Using 48 tonne trucks:	833.4 trucks per year / 312 =	2.67 trucks per day
Average:		4.12 trucks per day

Based on the use of 23 to 48 tonne trucks, the number of truck movements expected would be between 3 and 6 truck trips per day, which will produce between 2-3 movements in and 2-3 movements out per day over an 11 hour period. On average, this means the proposed development will generate 4-5 truck trips per day, which equates to less than 1 truck movement every 2 hours.

Due to the nature of the proposed development, the arrival and departure times of heavy vehicles is unknown. This will be dependent on the demolition and construction projects that the facility will be receiving waste material from.

Car movements can be based on the expected number of employees. For 3 full time employees, there would be 6 car movements per day. Three movements at 7am and three at 6pm.

9.4.1.3 Proposed Intersection Assessment

The Traffic and Parking Impact Assessment undertaken by ML Traffic Engineers included a proposed intersection assessment. External traffic travelling to and from the site will most likely travel through the following three intersections:

- Stannix Park Road and Sargents Road;
- Sackville Road and Stannix Park Road; and
- Sackville Road with Ebenezer Wharf Road and Lockhart Road.

Additional trips associated with the proposed development were included in the proposed intersection assessment using the SIDRA model and results for all 3 intersections were as follows:

- All turn movements have LoS A for both AM and PM peak hours
- The additional trips do not change the LoS of any turn movements or the overall intersection.

The assessment made the following conclusions:

- The proposed development is a modest trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed development can be accommodated at the nearby intersections and road network without noticeably affecting intersection performance, delays or queues.



- There are no traffic engineering reasons why a planning consent for the proposed development should be refused.

9.4.1.4 Car Parking

Car parking requirements are set out in the Hawkesbury Development Control Plan, Part C.

The DCP requires that car parking is provided generally in accordance with the following standards set out in Clause 2.5.

There is no specific guideline for use of the site as a landscaping supply business or a waste recovery facility. Therefore, the standard for “Industry, Factory, Warehouse, Bulk Stores”, is applied and the following table details the required car parking spaces for the proposed development.

The gross floor area for the building was calculated to be a total area of 2172 m² and therefore the required number of car parking spaces for the proposed site is 25 including 1 disabled parking bay.

Table 5-1: Car Parking Rules for Industrial Use under Clause 2.5.3 of the Hawkesbury DCP

Use	Standard	GFA (m ²)	Required Spaces	Complies
Industry, Factory, Warehouse, Bulk Stores	4 spaces for all development up to 300m ² of GFA,	First 300m ²	4	Yes
	then 1 space for each 90m ² of GFA or part thereof, in excess of 300m ²	Remaining 1,872m ²	21	
Required number of car spaces			25	

The site plan shows there will be 27 car parking spaces (including one disabled parking space) provided on site. Therefore, the proposed development complies with the DCP.

The traffic and parking assessment (Appendix 5) prepared by ML Traffic Engineers concurs with the above conclusion.

9.4.1.5 Site Access

Two separate access driveways to the site are proposed. Both driveways access the site via Sargents Road. One access driveway is for cars to enter and exit the carpark. The second access driveway allows trucks to enter the site and access the weighbridge, storage bays and shed without needing to drive through the carpark.

9.4.2 Sargents Road

The potential sealing of Sargents Road was brought up as a concern to be addressed in Council Pre-lodgement notes as follows:



Sargents Road is unsealed and in its current condition would be unsuitable for use by heavy vehicles. The sealing of Sargents Road would therefore be required from Stannix Park Road to the subject property should the operation of a landscaping material supplies premises or resource recovery facility be nominated.

Furthermore, consultation with residences close to the site raised the following concerns regarding Sargents Road:

- The road is narrow, especially for truck use. An insufficient amount of room is available for two opposing trucks to pass.
- Sargents Road is a dirt road overlain with a thin layer of blue metal.
- The road becomes rilled after heavy rain events (was rilled when the community consultation was conducted).
- Road deterioration occurring due to more frequent truck movements.
- Dust raised by truck movements.

The traffic and parking assessment indicates that Sargents Road is an unsealed rural road ending in a cul-de-sac with one lane each way and a default speed limit of 50 km/hr. Council is the authority for the road.

The main issues in relation to the current condition of Sargents Road are the potentially inadequate road width to allow trucks to pass, potential deterioration of the road over time and increased dust associated with additional vehicle movements. The following sub-sections address these issues.

9.4.2.1 Road Width

The width of Sargents Road is approximately 6 m, which is adequate for 2 x 3 m travel lanes. The proposed development is a low traffic generator with an average of 4-5 truck trips per day, which equates to less than 1 truck movement every 2 hours.

9.4.2.2 Unsealed Condition

Materials used to seal roads such as hot-mix asphalt and bitumen are suitable for roads which encounter high volumes of traffic.

There would be less than 30 annual average daily traffic trips along Sargents Road including those associated with the proposed development. An average of less than 1 truck movement every 2 hours are associated with the proposed development between 7am and 6pm, with an estimated 3 cars each morning and 3 cars in the evening resulting in 1-2 vehicle movements per hour Monday to Saturday. Trucks would be 23 to 48 tonnes in size.

Sargents Road is approximately 960 m in length from the intersection with Stannix Park Road to the entrance of the subject site.

9.4.2.3 Dust Generation

Of the seven dwellings along Sargents Road, only three (3) are less than 100 m separation distance from the road. These include:



- 355 Stannix Park Road – Grange Growing Solutions: 25 m
- 37 Sargents Road – 20 m
- 71 Sargents Road – 80 m

Dwellings over 100 m from the road are not expected to be impacted by dust emissions from traffic travelling along unsealed surfaces.

To reduce the potential dust emissions from use of the road, the speed limit of the road could be reduced and a dust seal be used along the section of roadway within the immediate vicinity of the above dwellings.

A dust seal is a low cost technique which consists of a seal applied to the existing road configuration, with limited need for road drainage, road formation and road pavement reconstruction. A dust seal is usually most suitable for low traffic roads where the cost of a seal can offer maintenance savings, improved amenity and or environmental outcomes. A dust seal is a risk based solution for locations where road works to standard engineering specifications are non-economic (Narrandera Shire Council).

Sika Dust Seal dust suppressant and soil stabiliser or similar is recommended for this purpose. The dust seal should be applied by a suitably qualified contractor. An information sheet for Sika Dust Seal is provided as an attachment.

9.4.2.4 Recommended Mitigation Measures

As an alternative to sealing Sargents Road using bitumen and/or hot-mix asphalt, the following treatment and control measures are recommended:

- Reduce the speed limit along Sargents Road to 40 kph and install speed limit signs; and
- Apply a dust seal to the road surface in accordance with manufacturer's specifications to minimise dust emissions.

It is ultimately Council's decision whether the road should be sealed and the proponent understands and respects that Council may require Sargents Road to be sealed.

9.4.3 Swept Paths

Swept path diagrams have been provided for on-site truck movements and for the intersection of Stannix Park Road and Sackville Road. These are provided in Appendix 5.

The diagrams show that there is ample room on site for truck manoeuvring, for trucks to enter the site and building and leave the site in a forward direction.

Swept path diagrams for the intersection of Stannix Park Road and Sackville Road show that this intersection requires an upgrade to allow for 19 metre trucks to use this intersection and access the site.



9.5 BIOSECURITY

A biosecurity (pests, weeds and disease) risk assessment was requested by the Department of Primary Industries (Agriculture) to assess the likely plant animal and community risks associated with the proposed development. The nature of the incoming materials to be processed at the site are of an inert nature, being ENM, VENM, bricks, concrete and greenwaste. Therefore, a discussion on the biosecurity risk of the proposed development has been provided.

9.5.1 Identification of Hazards

HB 203-2012: *Managing Environment-Related Risk* defines a **risk source** as:

a tangible or intangible element that alone or in combination has the intrinsic potential to give rise to risk. It is thus an encompassing term that includes the terms 'hazard' (a source of potential harm) and 'environmental aspect'

A **biosecurity risk** is the risk of “transmission of infectious diseases in crops and livestock, quarantined pests, invasive alien species, and living modified organisms” (Koblentz, 2010).

The main hazards associated with the proposed development have been identified as follows:

- Spread of pests;
- Spread of disease; and
- Spread of weed seed.

9.5.2 Discussion

9.5.2.1 Spread of Pests

The risk of spread of pests such as insects is associated with the incoming greenwaste. Consequences of pests being brought onto site may include:

- Alteration of ecosystem function including competition with native animals for food and shelter;
- Reduction of primary industry productivity of adjacent land through destruction of pastures and crops;
- Destruction of natural resources including soil disturbance and removal of vegetation;
- Increased threat to human and animal health through the potential spread of disease;
- Predation of livestock and native flora and fauna.

Greenwaste would be limited to garden trimmings and trees suitable to mulch and would not include food waste. Therefore, the risk to biosecurity from the spread of pests is low.

9.5.2.2 Spread of Disease

Spread of disease may present a risk if diseases are brought in with incoming greenwaste. Consequences may include:



- Soil-borne plant pathogens may cause crop plant diseases, resulting in significant economic losses
- Spread of bacteria causing diseases in humans.

Diseases being brought in with garden trimmings and tree cuttings is highly unlikely and the biosecurity risk is therefore extremely low.

9.5.2.3 Spread of Weed Seed

The risk of the spread of weed seed is associated with the receipt, mulching and stockpiling of greenwaste at the site. Consequences of weed seed being brought onto site may include:

- Weeds can become a major threat to the natural environment, threatening the survival of native plants and animals.
- Weeds can impact on the price of food, human health through allergies and asthma, recreational activities and the economy.

Weed management is addressed in Section 8.5.6. With management practices in place, the spread of weed seed is low.

9.5.3 Recommended Safeguards

Due to the nature of the incoming materials and processes involved in the proposed development, the risk to biosecurity is low. Therefore a biosecurity response plan is not considered warranted. Recommended weed management is detailed in Section 8.5.6.



10. CUMULATIVE IMPACTS AND SAFEGUARDS

This section provides an assessment of the potential cumulative impacts that may arise as a result of the operations from the proposed development, concurrently or sequentially with other projects in the region.

Cumulative impacts are incremental environmental impacts that are caused by past, present or future activities that, when combined, may have further cumulative effect. In fact, the environmental impacts of any single project upon a receiver or resource may not be significant when considered in isolation; however, the potential impacts may increase when individual effects are considered in combination, either with the same project or together with other projects.

The potential cumulative impacts that could arise from the operations of the proposed development are assessed in the following subsections.

10.1 AIR QUALITY

The air quality impact from the proposed development has been assessed in accordance with the NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016*. This document specifies particular pollutants which are assessed as a cumulative impact (incremental impact from site + background). The pollutants assessed cumulatively relevant to the subject site are PM₁₀, PM_{2.5} and TSP.

Odour is not considered as a potential emission that would be generated from the proposed development and therefore was not assessed.

TSP and PM₁₀ emissions at all sensitive receptors were predicted to comply with the *Approved Methods* criterion for an annual averaging period.

The maximum predicted impact for the annual averaging period for PM_{2.5} does not comply with the criterion of 8 µg/m³. As the maximum predicted increment is 0.01 µg/m³, this non-compliance is attributed to the annual background levels of 8.2 µg/m³ that already exceed. The impacts from site activities are considered to be negligible. The maximum predicted impacts for the 24 hour averaging period of PM_{2.5} complies with the criterion of 25 µg/m³ at all sensitive receptors.

The maximum predicted impacts for the 24 hour averaging period of PM₁₀ exceed the criterion of 50 µg/m³ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolara Road, Ebenezer) with impacts of 50.29 µg/m³, 50.45 µg/m³, 50.2 µg/m³ respectively. This is attributed to the maximum daily background concentration of 49.3 µg/m³ which occurred on one day of the year.

In cases of elevated background concentrations, the NSW EPA requires a demonstration that no additional daily exceedances of the impact assessment criteria will occur as a result of the proposed site activities. Contemporaneous addition of the predicted daily increments of PM₁₀ with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM₁₀ would result due to the proposed site activities.



10.2 NOISE AND VIBRATION

Operational noise is a critical environmental issue in any area with surrounding residential receivers. The existing background noise levels were used in determining the project criteria for the noise impact assessment. The cumulative impact of the development was assessed in the road traffic noise study included in the Noise Impact Assessment (Appendix 5). All relevant noise criteria were satisfied at nearest residential receivers, provided that all the recommended noise controls are maintained throughout the operative life of the facility.

10.3 SURFACE WATERS

Collective contributions from the various rural and industrial facilities in the Ebenezer area could result in degraded quality of surrounding surface waters, potentially through the contamination of stormwater run-off due to accidental release of sediments, chemicals or waste. The potential for release of sediments is controlled using various drainage controls. The potential release of chemicals or waste from subject site would be unlikely, and any accidental release could be easily contained on site as a result of the current safeguards in place. Therefore, contribution of the individual site has been appropriately mitigated and cumulative long term impacts are considered to be insignificant.

10.4 WASTE MANAGEMENT

A major incident or recurring incidents involving the storage and management of waste products could have potential cumulative impacts if considered in the context of the surrounding area, which has the potential to deal with large volumes of waste generation. Incidents include accidental spillages that have the potential to enter the surrounding environment causing land and water pollution.

A number of safeguards and management measures would continue to be established at the site in order to prevent accidental release of any waste. With these procedures and safeguards in place, the contribution of the site to cumulative impacts from the incorrect handling and management of waste would be insignificant.

10.5 HAZARDS AND RISK

Hazards and risk associated with the proposed development are related to the potential for fires, spillage of chemicals and release of particulates into the surrounding environment via the site's drainage/stormwater system.

There are safeguards established at the site to reduce the risk of fires as well as the risk of release of chemicals and particulates, such as the storage of diesel according to relevant standards including bunding, provision of spill kits and appropriate staff training in emergency response.

Cumulative impacts are not expected due to the current safeguards and procedures in place. Additionally, sufficient fire protection equipment would be provided to address any potential fire incidents.



10.6 TRAFFIC AND TRANSPORT

The traffic impact assessment for the proposed development, undertaken by ML Traffic Engineers, considered cumulative impacts on the existing road network by using existing traffic count data of the surrounding road networks. Key intersections were assessed for the additional traffic generated by the proposal during AM and PM peak hour traffic.



11. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecologically sustainable development (ESD) means using, conserving and improving natural resources so that the ecological processes on which life depends can continue in the future. There are four main principles of ESD, which should be considered for any development:

- The precautionary principle;
- Inter-generational equity;
- Conservation of biodiversity and ecological integrity; and
- Improved valuation, pricing and incentive mechanisms such as the “polluter pays” principle.

Other ESD guiding principles are:

- Public participation in decision making;
- Access to information and to justice; and
- Application of environmental impact assessment.

The meaning of each principle and how each principle was considered and/or incorporated in the proposed development are addressed in Table 11-1.

To fulfil ESD principles in a commercial/industrial development, one requires an effective and environmentally-sound approach to the design, operation and management of the development, as well as good planning and decision making. As demonstrated in the following table, various objectives and mechanisms had been included in the development in order to achieve ESD.

Table 11-1: ESD Principles – Meaning and relevance to the Proposed Development

Principle's Meaning	Relevance to Proposed Development
The precautionary principle	
Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.	The proposal will implement various mitigation measures and pollution safeguards (discussed in Section 12) that would prevent any serious and irreversible damage to the environment
Inter-generational equity	
The current generation should make sure that the health, diversity and productivity of the environment maintained or enhanced for the benefit of future generations.	The proposal will implement various mitigation measures and pollution safeguards (discussed in Section 12) that would avoid interference with the health, diversity and productivity of the environment.
Conservation of biodiversity and ecological integrity	
This means conserving the diversity of flora and fauna and the health and sustainability of ecosystems.	The proposal will implement various mitigation measures and pollution safeguards (discussed in Section 12) that would minimise impacts on the diversity of flora and fauna and the health and sustainability of ecosystems.



Table 11-1: ESD Principles – Meaning and relevance to the Proposed Development

Principle's Meaning	Relevance to Proposed Development
Improved valuation, pricing and incentive mechanisms such as the “polluter pays” principle	
This means integrating long-term and short-term economic, environmental, social and fairness considerations into decision-making. For example, by making sure that the price of products reflects the true costs of both production and disposal at the end of a product's life. The “polluter pays” principle means that the costs of pollution and waste should be paid by those who cause the pollution or create waste.	The proposed development is a resource recovery facility which prices in the cost of processing waste.
Public participation in decision making	
This means that members of the public should be able to participate at different stages of environmental decision-making processes.	A copy of this EIS will be published for public review and comment for a minimum statutory period (depending on the Local Government Area). After the public exhibition, all substantive comments are considered and further analysis is undertaken, if required. The final EIS is then published again with responses to substantive comments.
Access to information and to justice	
This means providing people access to information and to the courts (i.e. a legal right to bring a claim.).	People will be able to access most information during the community consultation process and public exhibition period. Additionally, the Australian public can access other information by making a request for information under the Freedom of Information Act 1982.
Application of environmental impact assessment	
This means taking the assessment of environmental impacts into account when making decisions.	Environmental impacts have been taken into account when making decisions. This is discussed throughout the EIS.

The above principles have been incorporated into the overall design of the project and into the management of operations on site.

The main environmental safeguards to be implemented in order to minimise environmental harm, in line with ESD principles, are as follows:

- Implementation of dust controls;
- Implementation of noise controls;
- Implementation of ecological controls;
- Stormwater pollution control measures;
- Fire protection services;



- Storage and handling of minor quantities of hazardous chemicals in accordance with relevant Australian Standards, including hardstand/bunded areas integrity management and adequate maintenance of dangerous goods storage;
- Waste management and stringent procedures to manage the incoming and outgoing waste; and
- Environmental Management Plan (EMP).

The proposed development would not have any foreseeable negative impacts on socio-economic aspects. Instead, a positive contribution from the increased operations on site would be the creation of jobs, with additional employment opportunities being provided. Increased operations are also to focus heavily on supplying the local markets. As a result, the proposal could have positive economic “spin-off” effects in the local region, by enhancing social productivity while not undermining ecological systems. This aspect would be in accordance with the inter-generational equity principle of ESD.

In order to monitor the sustainable performance of a development, various sustainability indicators can be used.

Examples of these indicators are outlined in the table below and have been addressed in relation to the subject site and its considerations for ESD and sustainable practices. The site’s EMP will be used (and be continually updated) in order to maintain the principles of ESD and monitor the sustainability indicators mentioned in the table.

Table 11-2: Sustainability Indicators

Indicator category	Comments and Description
Community	• Increase in employment opportunities; • Strengthening of local economy; • Level of knowledge-based investment increased; • No net loss of heritage or other features, buildings, places of high community importance; and • No loss of community integrity.
Ecosystems	• Minimise reduction in richness or abundance of flora and fauna species in aquatic or terrestrial environments; • Minimise reduction in the existing landscaping of the site; • No net increase of pests or disease threats to the health of the ecosystem; and • Reduction of hazards which are threats to the health of the ecosystem (fire, pollution, etc.).
Soils	• No net topsoil erosion; • No increase in area of land affected by salinisation; and • No reduction in soil pH below certain levels.
Water	• Reduction of freshwater use per unit of production; • No net increase in levels of acidification or toxic substances, heavy metals, nutrient and sediment levels; and • No net reduction in quality of water bodies as aquatic habitats.
Air	• No net reduction in air quality.
Energy	• Programs to reduce the use of fossil fuels for transportation and energy consumption



12. MITIGATION MEASURES AND MANAGEMENT

This section provides a summary of the mitigation measures required to ensure that the surrounding natural and built environment is safeguarded from potential impacts of the proposed development. An overview of the site management plans to be used on site is also provided, together with a description of incident management procedures.

12.1 SUMMARY OF CONTROLS AND MITIGATION MEASURES

Table 12-1 presents a summary of the potential impacts of the site activities discussed in Sections 8, and identifies the environmental safeguards and control measures that are recommended throughout the EIS to provide a sufficient level of protection, to both the built and natural environment surrounding the development.

Table 12-1: Summary of Potential Impacts, Environmental Safeguards and Control Measures

Potential Impacts	Safeguards and Control Measures
Air	
Generation of particulate emissions from processing operations and vehicle movements exceeding compliance levels, and resulting in impacts to air quality and complaints from the community.	- Processing operations undertaken within an enclosed building. - Stockpiles to be located within material storage bays, with 4 metre high walls on 3 sides - Use of water sprays for dust suppression - Heavy vehicle wash bay facilities
Noise	
Generation of noise by use of equipment on site and vehicle movements exceeding compliance levels and resulting in impacts to acoustic amenity and complaints from the community.	Construction Noise Construction activities to take place during standard construction hours only. Operational Noise - Hours of operation limited to 7am to 6pm Monday to Friday and 8am to 4pm Saturdays. - Crushing and screening activities to be undertaken within the building only. - Eastern most roller shutter door (roller shutter door 4) is closed when the crusher is operating. - The roof and walls of the building to be constructed of 0.5mm colorbond sheet steel ($R_w = 22$ dB) and concrete floor. - Mobile equipment to be fitted with reversing lights or white noise reversing alarms.



Table 12-1: Summary of Potential Impacts, Environmental Safeguards and Control Measures

Potential Impacts	Safeguards and Control Measures
	It is also recommended the following additional management practices be implemented: • Prohibition of extended periods of on-site revving/idling; • Minimisation of the use of truck exhaust brakes on site; • Enforcement of low on-site speed limits; • On-site vehicles to be maintained in accordance with a preventative maintenance program to ensure optimum performance and early detection of wearing or noisy components.
Water	
Contamination of stormwater run-off and consequent impacts on nearby surface waters.	• Processing operations within enclosed building; • Designated storage bays • Stormwater drainage channels and on site detention measures • Self bunded diesel storage tank • Hydrocarbon spill kits • Bunded and closed loop vehicle wash bay • Maintenance of all stormwater infrastructure • Erosion and sediment controls. • Baseline Water Monitoring as part of EMP
Waste Management	
Potential environmental and off-site impacts associated with excessive generation of waste and potential release of waste to surrounding environment.	• Segregated and designated storage bins and bays for appropriate storage of waste; • Licenced waste contractors for collection; • Waste minimisation and resource recovery practices implemented; • Stormwater pollution control; • Incoming waste procedure.
Hazards and Risk	
Incident involving the potential for a spill or fire. Bushfire.	• Chemical storage in accordance with relevant standard; • Control of ignition sources, including “no smoking” policy; • Adequate provision for escape; • Adequate fire protection equipment; • Spill controls including, self-bunded diesel storage tank, hydrocarbon spill kits and spill kit training; • Forklift driver training; • Emergency plan, Evacuation plan and emergency response training; • Static water supply of 20,000 L equipped with fittings to enable fire suppression; • Lot managed as an inner protection area (IPA) asset protection zone from the warehouse for a distance of 29m to NE, 36m to SE and 24m to SW and NW.



Table 12-1: Summary of Potential Impacts, Environmental Safeguards and Control Measures

Potential Impacts	Safeguards and Control Measures
Traffic and transport	
Low to modest traffic generator Truck sizes 23 to 48 tonnes may generate dust along Sargents Road and cause potential traffic hazard.	- Upgrade intersection of Stannix Park Road and Sackville Road to allow for 19 metre trucks to use this intersection; and Either: - Reduced the speed limit along Sargents Road to 40kph and install speed limit signs; and - Apply a dust seal to the road surface in accordance with manufacturer's specifications. OR - Seal Sargents Road.
Flora and Fauna	
Tree removal required. Site contains areas of significant biodiversity value.	- Limit development to area shown on site plan. - Removal of trees limited to those shown in the landscape plan and arboricultural implication assessment. - Implement landscape plan. - Implement tree management plan. - Implement weed management practices - Purchase of six (6) ecosystem credits for PCT 1081 - Project Ecologist to undertake pre-clearing survey and supervise all clearing under CEMP.

12.2 SITE MANAGEMENT PLANS

Various site management plans would need to be prepared or updated by Hala Constructions Pty Ltd prior to the operation commencing, to ensure that proposed operations will be undertaken in an environmentally safe manner and with consideration to work health and safety. The most important site management plans include the following:

- Emergency Plan (EP);
- Pollution Incident Response Management Plan (PIRMP); and
- Environmental Management Plan (EMP).

An outline of these reports is provided in the following sub-sections.

12.2.1 Emergency and Pollution Incident Response Management Plan

Holders of an EPL under the POEO Act 1997 are required to prepare and implement Pollution Incident Response Management Plans for each licensed activity. An Emergency Plan is also required.



A Pollution Incident Response Management Plan could be incorporated into the site's Emergency Plan for ease of use, resulting in an "Emergency and Pollution Incident Response Management Plan". The plan would be prepared in accordance with the following guidelines and standards:

- NSW Rural Fire Service Guidelines for the Preparation of Emergency/Evacuation Plans;
- AS 3745–2010 *Planning for Emergencies in Facilities*;
- NSW EPA Environmental Guidelines: Preparation of Pollution Incident Response Management Plans;
- AS 1940–2017 *The storage and handling of flammable and combustible liquids*;
- AS/NZS 1596:2014 *The storage and handling of LP Gas*; and
- AS 4332–2004 *The storage and handling of gases in cylinders*.

The aims of the plan are: to provide a clear understanding of how to handle and react to any emergency or pollution situation that may occur at the site in the form of effective control structures, procedures and directives; to prevent or minimise the impact of an emergency and pollution incident on human life, the community and surrounding environment; and to facilitate a return to *normal* or *safe* operations as soon as possible.

The procedures contained in the plan should be designed to protect life and where possible prevent or minimise damage to the equipment, site and installations at the site and facilitate a return to normal operations by providing effective utilisation of the safety features, systems and/or equipment installed at the site. The procedures would be updated as continually improving guidelines to support site management and handling of unanticipated situations.

An Incident Reporting and Investigation procedure should be included in the plan to address the following aspects and actions:

- If required, report incident within 24 hours of the occurrence of the incident;
- Undertake an incident investigation especially if multiple incidents occur or if the incident results in serious injury/death or property damage; and
- Monitor and review incidents to determine follow-up actions, prevent the recurrence of the incident and ensure that follow-up actions are implemented.

12.2.2 Environmental Management Plan

Hala Constructions Pty Ltd will require an Environmental Management Plan (EMP). The EMP should address the following major elements:

- Legal and regulatory requirements;
- Site description including environmental characteristics and general infrastructure;
- Operational conditions and controls;
- Environmental management activities in relation to particular aspects and impacts;
- Reporting, staffing and training requirements;
- Environmental monitoring and review; and
- Environmental procedures including but not limited to:
 - ▶ Incoming waste procedure;
 - ▶ Dust management plan;
 - ▶ Noise management plan;
 - ▶ Water monitoring program; and
 - ▶ Stormwater management procedure.



The EMP would adopt the framework suggested by the ISO 14001 Standard. This would maximise consistency and simplicity in the administration and implementation of the EMP procedures. Specific procedures would be developed to manage the identified environmental aspects and impacts of site activities.



13. STATEMENT OF COMMITMENTS

Hala Constructions Pty Ltd commits to the following course of action during the installation and operation of the proposed development at 99 Sargents Road, Ebenezer:

- Hala Constructions Pty Ltd will abide by all legal requirements, licence conditions and approvals pertaining to the site.
- Hala Constructions Pty Ltd will ensure the external areas are kept tidy and free of items and debris to facilitate movement of vehicles on site and minimise potential pollution.
- Hala Constructions Pty Ltd will implement and maintain the following safeguards and mitigation measures at the site, as detailed in this EIS:
- Construct the roof and walls of the building with 0.5 mm colorbond sheet steel ($R_w = 22$ dB) and concrete floor.
- Crushing and screening activities to be confined within the building.
- Ensure the eastern most roller shutter door is closed when the crusher is in operation.
- Fit mobile equipment with reversing lights or white noise reversing alarms.
- Air quality control equipment (water sprays for dust suppression) must be used and maintained.
- The diesel tank must be self bunded and located in accordance with the relevant Australian Standards.
- Spill kits must be provided within 10 metres of the diesel tank and must be maintained and replenished as required.
- Upgrade intersection of Stannix Park Road and Sackville Road to allow for 19 metre trucks to use this intersection.
- Seal Sargents Road OR reduce speed limit and apply dust seal to road surface.
- Stormwater drainage measures, and all stormwater infrastructure and pollution control devices are to be regularly inspected and/or cleaned and maintained in good working condition.
- Lot must be managed as an inner protection area (IRA) asset protection zone.
- Provide static water supply of 20,000 L equipped with fittings to enable fire suppression.
- Staff must be trained in spill response and emergency procedures, including firefighting techniques.



- Regular sweeping and good housekeeping must be undertaken for all operational and storage areas at the site.
- All waste must be segregated and stored in designated bays and bins.
- Fire services and equipment must be provided in accordance with National Construction Code (NCC) and relevant Australian Standards.
- All equipment should be regularly inspected and maintained.
- All staff must wear PPE relevant to their role.
- Hala Constructions Pty Ltd will implement a Construction Environmental Management Plan.
- Hala Constructions Pty Ltd will implement an Environmental Management Plan and ensure it incorporates the commitments, safeguards, mitigation measures and recommendations documented in this EIS.
- Hala Constructions Pty Ltd will implement an Emergency Plan and Pollution Incident Response Management Plan.



14. LIST OF APPROVALS AND LICENCES

A list of licences, approvals and permits required for the proposed development are shown in the following table in **bold**.

Table 14-1: Required licences, approvals and permits

Type	Relevant Legislation	Required?	Agency
LICENCES			
Environment Protection Licence	Clauses 34 and 42 of Schedule 1 of the Protection of the Environment Operations Act 1997	Yes	NSW EPA
Surface Water Licence	Water Act 1912	No	Office of Water
Groundwater Licence	Water Act 1912	No	Office of Water
Controlled Activity Approval	Water Management Act 2000	No	Office of Water
PERMITS			
Permits under the Fisheries Management Act	Fisheries Management Act 1994	No	DPI Fishing and Aquaculture
Aboriginal Heritage Impact Permit	National Parks & Wildlife Act 1974	No	OEH
Permits under the Heritage Act 1977	Heritage Act 1977	No	OEH
APPROVALS			
Development Consent	Clause 32 of Schedule 3 of the Environmental Planning and Assessment Act 1979	Yes	Hawkesbury City Council
Alter or erect improvements within a mine subsidence district	Mine Subsidence Compensation Act 1961	No	Mine Subsidence Board
Consent for works and structures in a public road	Roads Act 1993	No	RMS
Sub-division or development of bush fire prone land	Rural Fires Act 1997	No	Commissioner of the NSW Rural Fire Service



15. JUSTIFICATION AND CONCLUDING REMARKS

15.1 PROJECT JUSTIFICATION

The local demand for processing construction and demolition waste is expected to increase in following years, which will lead to moderate industry growth on the domestic market.

The family business already undertakes the demolition of existing residences and recycles the removed materials by transporting this to existing resource recovery facilities operated by other parties. It makes good business sense for the family to extend their current business operation to include a resource recovery and landscaping supplies component to fulfil their business need to recycle VENM and C&D waste materials.

Natural resources are not infinite, currently there is a shortage of natural sand available for construction along the east coast with a push from industry to better utilise the fine-grained aggregate material generated during crushing (termed “manufactured sand”). The increase in construction projects in NSW means an increase in the generation of quantities of construction and demolition waste.

This proposal allows Hala Constructions Pty Ltd to utilise a growing market need that supports sustainable use of waste materials and the project has been driven, and is justified, by the need to match these growing market demands. Furthermore, the resource recovery component of the business would complement the landscape materials supplies component through the recovering of waste materials that would be reused as landscape materials. The nature of the materials to be processed at the site align the development within the rural locality.

The design of the development is such that the area of the site to be used is restricted to an already cleared and disturbed location on site to minimise the number of trees requiring removal. In addition, this area is well shielded from neighbouring properties and the landscape plan would provide additional vegetation to further improve the visual amenity of the site.

The justifications for selecting the subject site and for implementing the proposed development are listed as follows:

- The subject site has ample room available to cater for the proposed operations.
- The site is not in a sensitive land use area.
- The development is a permitted use with consent.
- The development is a beneficial use which would fulfil the principles of ecologically sustainable development and is to be encouraged.
- The development generates local employment.
- Transport routes are readily available.
- The site has sufficient room for on-site parking and truck manoeuvring.
- The proposed development will recycle construction and demolition waste, therefore reducing the amount of waste for disposal.
- The proposed development will have extensive environmental safeguards to provide assurance in regards to the expected degree of environmental impacts.



15.2 CONCLUDING REMARKS

The environmental assessment process has enabled the potential impacts of the proposed development of a landscaping supply business and resource recovery facility to be evaluated, and control strategies to be devised in order to ensure compliance with regulatory standards.

The development has been designed to minimise environmental impacts with operations to be undertaken within an enclosed building and additional safeguards to be put in place and therefore request is made that approval be granted.

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APPENDICES

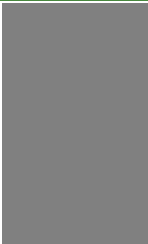
EIS Appendix 1: Air Quality Impact Assessment

**AIR QUALITY IMPACT ASSESSMENT
FOR HALA ALAMEDDINE
99 SARGENTS ROAD, EBENEZER**

Prepared for: Hala Constructions Pty Ltd

Prepared by: Kate Barker, Environmental Scientist
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EXECUTIVE SUMMARY

Benbow Environmental has been engaged by Hala Constructions Pty Ltd to undertake an Air Quality Impact Assessment (AQIA) for the proposed landscaping supply business and resource recovery facility located at 99 Sargents Road, Ebenezer. The assessment determines the predicted dust and particulate matter contribution from the proposed site operations.

This AQIA has been prepared in accordance with the NSW EPA guidelines “*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*” (2016) (AMMAAP), using background data is then combined with the predicted levels resulting from the proposed operations of the resource recovery facility to assess the cumulative air quality impacts.

This AQIA has been assessed using emission data adopted from the National Pollutant Inventory’s *Emission Estimation Technique Manual for Mining* (2012), *Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals* (2014), and *Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing* (1999).

The air dispersion model AERMOD was used for the prediction of off-site dust impacts associated with the air emissions from the proposed operations.

The maximum predicted impacts for the annual averaging period TSP comply with the *Approved Methods* criterion of $90 \mu\text{g}/\text{m}^3$ at all sensitive receptors.

The maximum predicted impact for the annual averaging period for $\text{PM}_{2.5}$ does not comply with the criterion of $8 \mu\text{g}/\text{m}^3$. As the maximum predicted increment is $0.01 \mu\text{g}/\text{m}^3$, this non-compliance is attributed to the annual background levels of $8.2 \mu\text{g}/\text{m}^3$ that already exceed the criteria. The impacts from site activities are considered to be negligible. The maximum predicted impacts for the 24 hour averaging period of $\text{PM}_{2.5}$ complies with the criterion of $25 \mu\text{g}/\text{m}^3$ at all sensitive receptors.

The maximum predicted impacts for the annual averaging period of PM_{10} comply with the *Approved Methods* criterion of $50 \mu\text{g}/\text{m}^3$ at all sensitive receptors. The maximum predicted impacts for the 24 hour averaging period of PM_{10} exceed the criterion of $50 \mu\text{g}/\text{m}^3$ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolora Road, Ebenezer) with impacts of $50.29 \mu\text{g}/\text{m}^3$, $50.45 \mu\text{g}/\text{m}^3$, $50.2 \mu\text{g}/\text{m}^3$ respectively. This is attributed to elevated daily background concentrations.

In cases of elevated background concentrations, the NSW EPA requires a demonstration that no additional daily exceedances of the impact assessment criteria will occur as a result of the proposed site activities. Contemporaneous addition of the predicted daily increments of PM_{10} with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM_{10} would result due to the proposed site activities.

Dust control measures are proposed for the site activities and are considered effective. No further controls are recommended.

Contents	Page
EXECUTIVE SUMMARY	I
1. INTRODUCTION	1
2. SITE DETAILS	2
2.1 Site Location	2
2.2 Land Use of Site and Surroundings	3
2.3 Nearest Sensitive Receptors	5
3. DESCRIPTION OF THE PROPOSAL	7
3.1 Site and Process Description	7
3.1.1 Construction details	7
3.1.2 Operational details	7
4. METEOROLOGY AND LOCAL AIR QUALITY	9
4.1 Representative Meteorological Data	9
4.1.1 WRF and MMIF	9
4.2 Wind Rose Plots	10
4.2.1 Local Wind Trends	10
4.3 Terrain and Structural Effects on Dispersion	12
4.4 Local Air Quality	13
5. AIR QUALITY CRITERIA AND GUIDELINES	14
5.1 Protection of the Environment Operations Act 1997	14
5.2 Protection of Environment Operations (Clean Air) Regulation 2010	15
5.3 Adopted Criteria & NSW Environment Protection Authority Guidelines	16
6. AIR QUALITY IMPACTS FROM CONSTRUCTION	17
7. AIR IMPACT ASSESSMENT	18
7.1 Emission Sources	18
7.1.1 Mitigation and Monitoring Measures	18
7.2 Adopted Emission Factors	18
7.2.1 Reduction Factors	19
7.3 Emission Rates	20
7.3.1 Assumptions	20
7.4 Source Configurations and Parameters	21
8. AIR IMPACT MODELLING	23
8.1 Dispersion Model	23
8.1.1 Meteorological Data	23
8.2 Air Impact Modelling Results	23
8.2.1 Maximum Impact	23
8.2.2 Contemporaneous Impact and Background	33
8.3 Discussion of Modelling Results	33
9. STATEMENT OF POTENTIAL AIR QUALITY IMPACTS	35

10. REFERENCES	36
11. LIMITATIONS	37

Tables	Page
Table 2-1: Nearest Receivers	5
Table 4-1: Summary of 2015 Data for PM _{2.5} and PM ₁₀ from Richmond Air Quality Monitoring Station.	13
Table 5-1: Applicable Particulate Criteria at Sensitive Receptors from the NSW EPA Modelling Guidelines (<i>Approved Methods</i> 2016)	16
Table 7-1: Emission Factors	19
Table 7-2: Emission Rates – Annual Averaging Period	21
Table 7-3: Emission Rates – 24 Hour Averaging Period	21
Table 8-1: TSP Annual Averaging Period Modelling Results	23
Table 8-2: PM ₁₀ Annual Averaging Period Modelling Results	25
Table 8-3: PM _{2.5} Annual Averaging Period Modelling Results	27
Table 8-4: PM ₁₀ 24 Hour Averaging Period Modelling Results	29
Table 8-5: PM _{2.5} 24 Hour Averaging Period Modelling Results	31
Table 8-6: Summary of Top Eight Days of Contemporaneous PM ₁₀ Impact and Background at Residential Receptor R7 (<i>Approved Methods</i> Criterion = 50 µg/m ³)	33

Figures	Page
Figure 2-1: Location of Subject Site	2
Figure 2-2: Aerial View of the Site	3
Figure 2-3: Site Zoning Under the Hawkesbury Local Environmental Plan 2012.	4
Figure 2-4: Nearby Receptors	6
Figure 3-1: Proposed Site Plan	8
Figure 4-1: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF base, Bureau of Meteorology (2015)	11
Figure 4-2: Local Topography of Site, Vertical Exaggeration by a factor of 10	12
Figure 7-1: Arrangement of Modelled Sources	22
Figure 8-1: TSP Annual Averaging Period Modelling Results	24
Figure 8-2: PM ₁₀ Annual Averaging Period Modelling Results	26
Figure 8-3: PM _{2.5} Annual Averaging Period Modelling Results	28
Figure 8-4: PM ₁₀ 24 Hour Averaging Period Modelling Results	30
Figure 8-5: PM _{2.5} 24 Hour Averaging Period Modelling Results	32

Attachments

- Attachment 1: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF, Bureau of Meteorology 2014 – 2017.
- Attachment 2: Long-term Climate Statistics for the Referenced Meteorological Station – Bankstown Airport, Bureau of Meteorology



1. INTRODUCTION

Benbow Environmental has been engaged by Hala Construction Pty Ltd to undertake an Air Quality Impact Assessment (AQIA) for the proposed resource recovery facility, to be located at 99 Sargents Road, Ebenezer, NSW 2756. The assessment determines the predicted dust and particulate matter contribution from the proposed site operations. The assessment does not include an assessment of odour impacts, as no odour is expected to be generated from the proposed development.

This AQIA has been prepared in accordance with the NSW EPA guidelines “*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*” (2016) (AMMAAP), which shall henceforth be referred to as the *Approved Methods*.

This AQIA uses existing air quality data to establish the background levels of dust and particulates. This background data is then combined with the predicted levels resulting from the proposed operations of the resource recovery facility to assess the cumulative air quality impacts.



2. SITE DETAILS

This section presents the site location, a description of the site and surrounds and a description of the existing development on the site.

2.1 SITE LOCATION

The subject site is located at 99 Sargents Road, Ebenezer, NSW 2756, and is legally described as Lot 288 in DP 751665. The site is located 13.5 km north-east of Richmond and 50 km north-west of the Sydney CBD within the Hawkesbury Council Local Government Area. Figure 2-1 shows the location of the subject site and Figure 2-2 provides an aerial view of the site.

Figure 2-1: Location of Subject Site





Figure 2-2: Aerial View of the Site



2.2 LAND USE OF SITE AND SURROUNDINGS

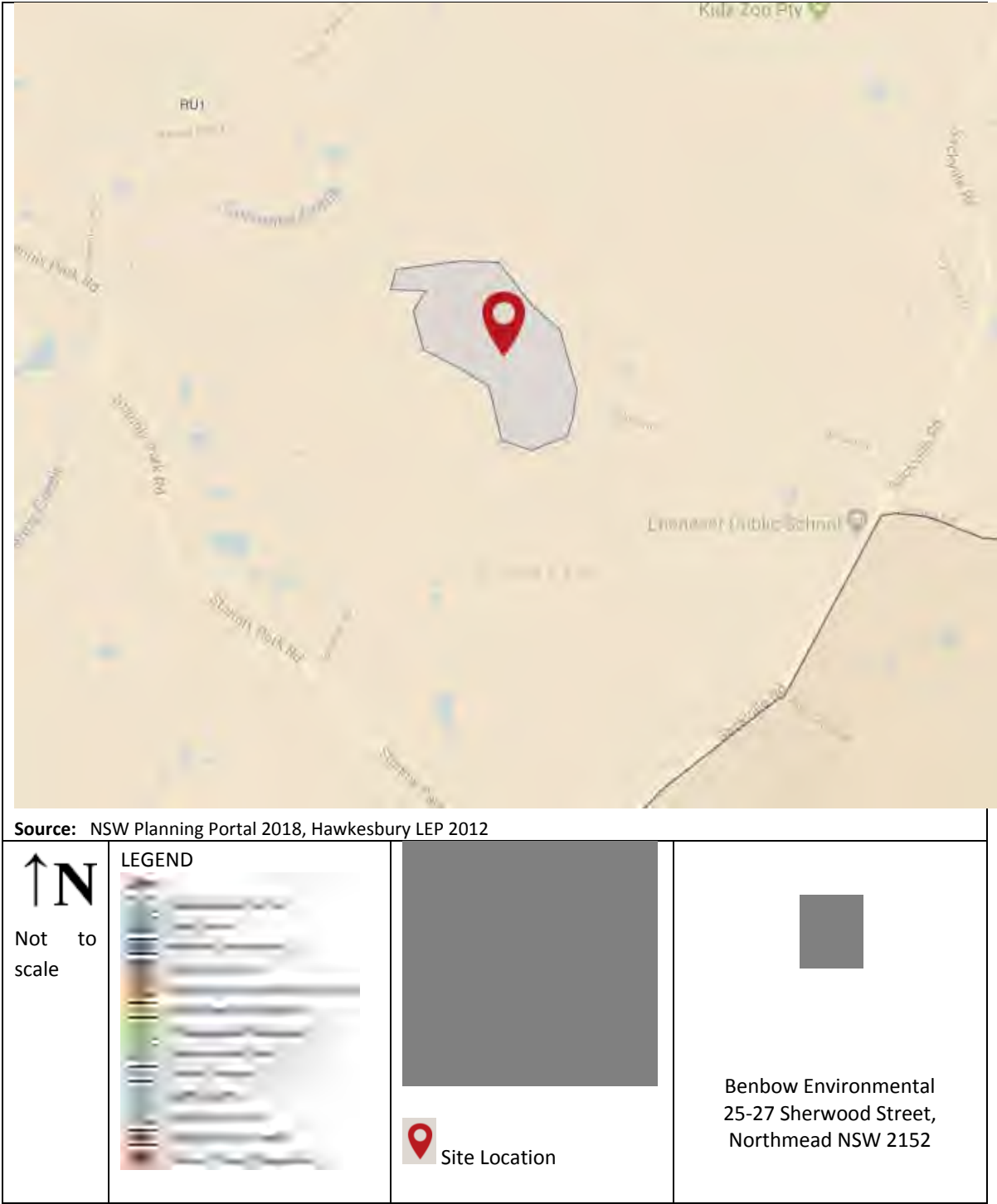
The site is zoned as ‘RU1 Primary production’ under the Hawkesbury Local Environmental Plan (LEP) 2012 as shown in Figure 2-3.

The surroundings are mainly Primary Production and Rural Landscape, with some Public and Private Recreation, General Industrial, Recreational Waterways, Special Activities, Village and National Parks and Nature Reserves. The nearest waterway is Currency Creek, approximately 550 m north-west of the subject site and the nearest residential area located 400 m to the south-south-west of the site.



Sackville Road is located 1,460 m east of the site, and St Peters Railway Station and King Street shopping district are approximately 700 m to the north-west. Adjacent to the site is Kings Estate International, an equestrian facility and Arrosers Labrador Breeders is to the south-west.

Figure 2-3: Site Zoning Under the Hawkesbury Local Environmental Plan 2012.





2.3 NEAREST SENSITIVE RECEPTORS

Table 2-1 identifies the nearest sensitive receptors that have the potential to be affected by the proposal. The aerial photographs of the sensitive receivers are shown in Figure 2-4. These receptors were selected based on their proximity and directional bearing from the subject site.

Table 2-1: Nearest Receivers

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Type of Receptor
R1	103 Stannix Park Lane, Wilberforce	Lot 111 DP 1171265	1230 m N	Residential
R2	82 Stannix Park Lane, Wilberforce	Lot 112 DP 1171265	930 m NW	Residential
R3	60 Stannix Park Lane, Wilberforce	Lot 2153 DP 1073493	890 m NW	Residential
R4	235 Stannix Park Road, Wilberforce	Lot 2 DP 48682	1240 m W	Residential
R5	283 Stannix Park Road, Wilberforce	Lot 1 DP 847274	1040 m W	Residential
R6	71 Sargents Road, Ebenezer	Lot 91 DP 1049276	390 m SW	Residential
R7	79 Sargents Road, Ebenezer	Lot 92 DP 1049276	Adjacent SW	Residential
R8	56 Sargents Road, Ebenezer	Lot 100 DP 1044703	520 m S	Residential
R9	89 Kolora Road, Ebenezer	Lot 4 DP 253783	650 m SE	Residential
R10	65 Kolora Road, Ebenezer	Lot 3 DP 253783	480 m SE	Residential
R11	88 Kolora Road, Ebenezer	Lot 2 DP 557365	350 m SE	Residential
R12	96 Kolora Road, Ebenezer	Lot 1 DP 557365	390 m NE	Residential



Figure 2-4: Nearby Receptors





3. DESCRIPTION OF THE PROPOSAL

This section of the report discusses the proposed operation of the site.

3.1 SITE AND PROCESS DESCRIPTION

The proposed development is for the operation of a landscaping supply business and a resource recovery facility to be located at 99 Sargents Road, Lot 288 DP 751665, Ebenezer.

The landscaping supply business would accept virgin excavated natural materials (VENM) sourced from excavations on sites where Hala Constructions operate and from other sites needing to remove VENM. The business may also accept and store ready-to-use landscaping materials. This material would be stored in stockpiles and resold in bulk.

The resource recovery facility would accept excavated natural material (ENM) and other building and demolition waste (concrete, bricks, tiles, ceramics and similar material) to be crushed and screened and sold as recovered fines and recovered aggregates. This process would be completed inside a building.

The proposed annual throughput at the site is 20,000 tonnes per year. Figure 3-1 shows the layout of the proposed site.

VENM and ENM Unloading and Storage

An area of approximately 497 m will be used for outdoor stockpiles within storage bays. This area will have walls surrounding and stockpiles will be limited to 5 m.

Crushing and Screening

Crushing and screening would occur within the main building. The roller shutter door will be 6 m tall.

Vehicle movement

Vehicles would enter from Sargents Road and are restricted to a circular path around the main building and stockpiles, to exit on Sargents Road.

3.1.1 Construction details

For preparation of the site for the landscaping business and resource recovery facility will require the construction of a large building in which the crushing and screening activities will be conducted, as well as a smaller building for offices. Toilet facilities would use a pump out system. There will also be a washbay, weighbridge, car park and capping of the external areas with roadbase.

3.1.2 Operational details

The facility is seeking operational hours of 7:00am-6:00pm Monday to Friday and 8:00-4:00pm Saturday, with no activity on Sundays or public holidays.

Figure 3-1: Proposed Site Plan





4. METEOROLOGY AND LOCAL AIR QUALITY

The meteorological data used in the modelling of this assessment was no-observation prognostic meteorological data. A prognostic meteorological data file created by Lakes Environmental with WRF using a representative year was pre-processed using AERMET for use in AERMOD. The representative year is selected based on the evaluation of weather monitoring stations for their proximity to the site, completeness of data, and similarity of topography to the subject site.

4.1 REPRESENTATIVE METEOROLOGICAL DATA

The nearest weather monitoring station to the subject site is the Richmond Raaf AWS operated by the Bureau of Meteorology. This monitoring station is located approximately 11 kilometres to the south-west of the subject site and was considered to be the most appropriate source of data for meteorological modelling due to its proximity to the site, completeness of data, and similar topography to the subject site.

The representative meteorological year of 2015 was selected based on long term averages from Richmond Raaf AWS. Meteorological data for 2015 was compared with long term averages for minimum temperature, maximum temperature, and wind run and found to be consistent. Wind roses representing the annual frequency of wind speed and direction were also compared for the five most recent meteorological years and found to be reasonably consistent (Attachment 1).

A 2015 prognostic meteorological data file was created by Lakes Environmental using the WRF-MMIF model. This data file was used as input into AERMET pre-processor to create onsite Surface and profile met data.

4.1.1 WRF and MMIF

Meteorological files were provided by Lakes Environmental. The WRF model is used to compute accurate windfields of a selected area. The MMIF program is used to convert WRF output into AERMOD-Ready Surface & Profile files.

The Weather Research and Forecasting (WRF) Model is a next-generation mesoscale numerical weather prediction system designed as a collaborative effort between the American National Center for Atmospheric Research and other meteorological specialist organisations. It was created for both atmospheric research and operational forecasting applications and serves a wide range of meteorological applications across scales from tens of metres to thousands of kilometres.

The Mesoscale Model Interface Program (MMIF) converts prognostic meteorological model output fields to the parameters and formats required for direct input into supported dispersion models such as AERMOD.

Execution of MMIF was done according to the recommendations found in the EPA's '*Guidance on the Use of the Mesoscale Modeling Interface Program (MMIF) for AERMOD Applications*' document'.



The AERMOD-Ready files were generated by processing the AERMET-Ready data files output by MMIF through the most recent version of the US EPA's AERMET meteorological pre-processor executable (Version **18081**). This includes use of the MMIF-generated AERSURFACE output file for Stage 3 surface characteristics

4.2 WIND ROSE PLOTS

Wind rose plots show the direction from which the wind is coming with triangles known as "petals". The petals of the plots summarise wind direction data into 8 compass directions ie. north, north-east, east, south-east, etc.

The length of the triangles, or "petals", indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class.

The proportion of time for which wind speed is equal to or less than 0.5 m/s, when speed is negligible, is referred to as calm hours or "calms". Calms are not shown on a wind rose as they have no direction, but they are noted under each wind rose as a temporal percentage.

The concentric circles in each wind rose are the axes that denote wind frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are the same size. The frequencies shown in the first quadrant (top-left quarter) of each wind rose are stated beneath the wind rose.

4.2.1 Local Wind Trends

Seasonal wind rose plots for this site using Richmond RAAF base AWS data from 2015 have been included in Figure 4-1. Annual average wind speeds of 2.49 m/s and a calms frequency of 15.05% were estimated. Annual winds from the south-west were found to be dominant and were present at a frequency of approximately 15%.

The average summer wind speed was estimated to be 2.78 m/s, with a calms frequency of 10.47%. South-westerly, easterly, and north-easterly winds were found to be dominant at a frequency of around 17%, 16% and 15% respectively.

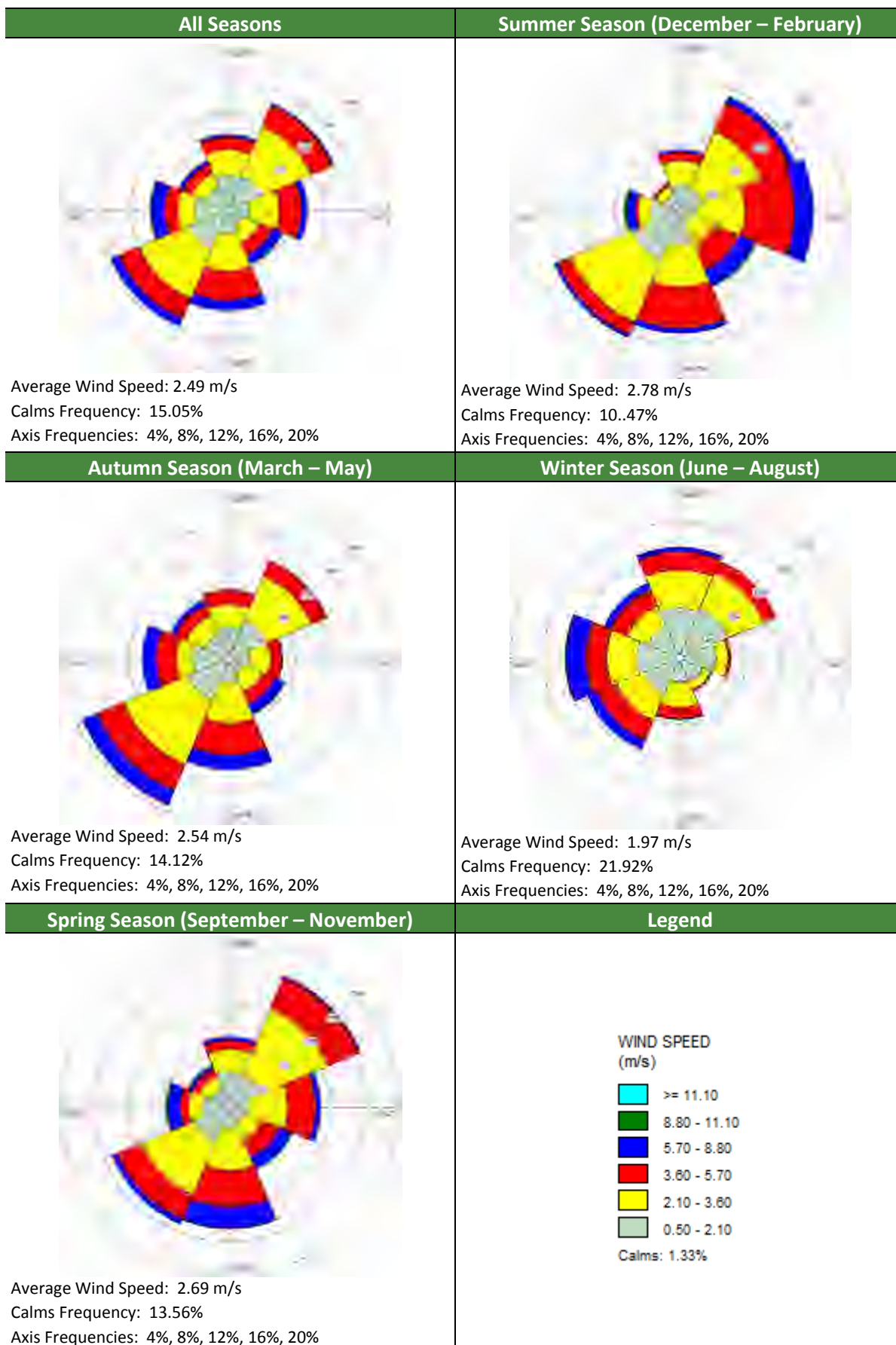
In autumn, dominant winds blew from the south-west (~19%). The average autumn wind speed was 2.54 m/s with a calms frequency of 14.12%.

The winter season data showed the prevalence of winds from the western and northern directions. The dominant winds blew from the west at a frequency of ~14%. Winds from the south-west, north and north-east were also common, at around 12% frequency each. The average winter wind speed was 1.97 m/s with a calms frequency of 21.92%.

In the spring time, average wind speeds of 2.69 m/s were recorded. Dominant winds were from the north-east (17%), south-west (15%) and south (14%). The spring calms frequency was 13.56%.



Figure 4-1: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF base, Bureau of Meteorology (2015)





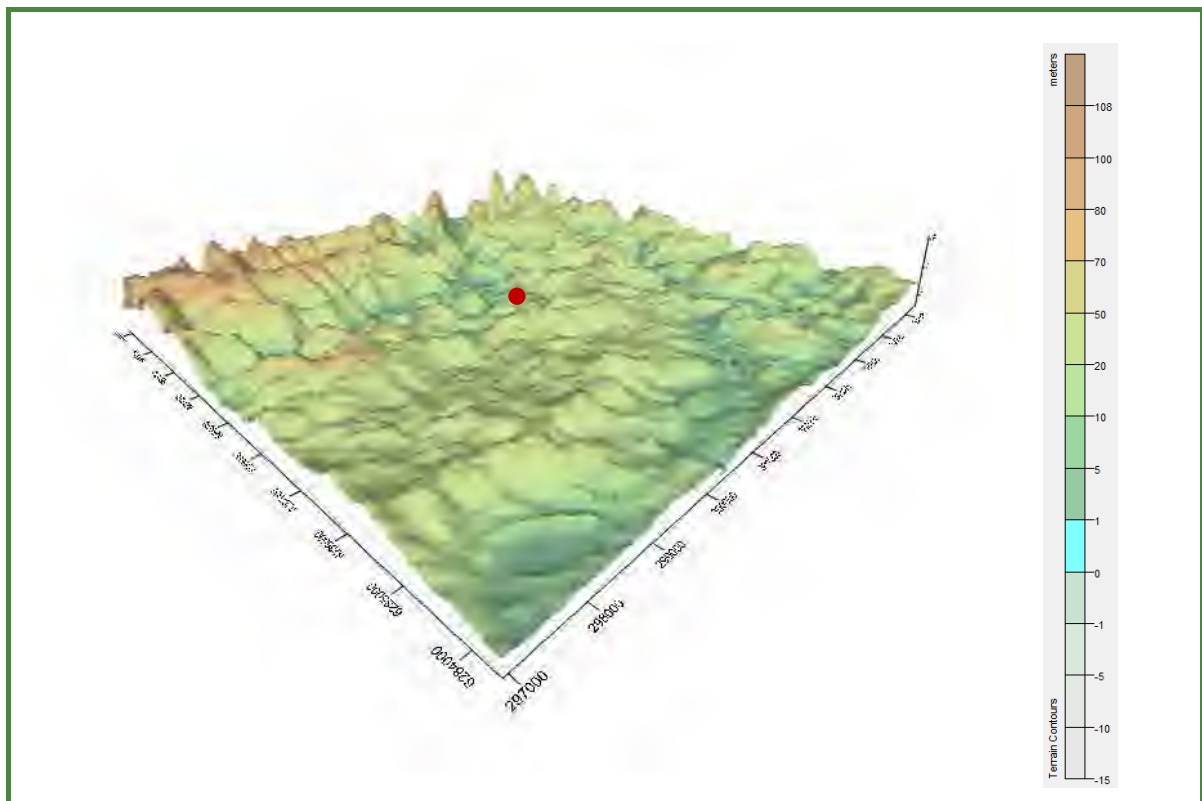
4.3 TERRAIN AND STRUCTURAL EFFECTS ON DISPERSION

The meteorological condition known as katabatic flow (or katabatic drift) is often identified as the condition under which maximum environmental impacts from primarily ground-based sources are likely to occur. Katabatic flow is simply the movement of cold air down a slope, generally under stable atmospheric conditions. Under such circumstances, dispersion of airborne pollutants is generally slow and the associated impacts can reach their peak.

If emissions from the site are significant, katabatic flow may affect far-field dispersion of emissions from site activities, as the subject site is situated at the top of an elevated area with drainage to the north-east. If katabatic flow were to affect this site emissions would travel in a north-easterly direction along the valley, however, there are no identified receptors within proximity to the site in these valley areas. All identified receptors are within the elevated area and therefore katabatic flow would not impact upon these near-field sources.

Figure 4-2 shows the terrain with the z-axis (i.e. vertical axis) exaggerated by a factor of 10 (i.e. a given distance on the x-axis or y-axis appears three times as great on the z-axis) in order to provide a clearer description of the topography. A coloured scale bar shows elevations corresponding to the colours used in the figures. It should be noted that these figures are an approximation of the actual terrain, based on terrain information from NASA SRTM 1-arc second digital elevation models.

Figure 4-2: Local Topography of Site, Vertical Exaggeration by a factor of 10





4.4 LOCAL AIR QUALITY

No air quality measurements have been undertaken specifically for this project. Instead, the nearest available air quality monitoring data was used to gain an understanding of what current pollutant levels may be around the site and to provide background air quality parameters for the assessment.

Ambient air quality data for PM_{2.5} and PM₁₀ was obtained from the NSW EPA Richmond air quality monitoring station located approximately 6.7 km west of the subject site, inside the campus of the University of Western Sydney, Hawkesbury. This station is considered to be site-representative. The relevant data is summarised in Table 4-1.

Table 4-1: Summary of 2015 Data for PM_{2.5} and PM₁₀ from Richmond Air Quality Monitoring Station.

Pollutant	Averaging period	Concentration (µg/m ³)
PM _{2.5}	Maximum 24 hr average for 2015	24.5
	2 nd highest 24 hr average for 2015	24.4
	3 rd highest 24 hr average for 2015	23.8
	Annual average for 2015	8.2
PM ₁₀	Maximum 24 hr average for 2015	49.3
	2 nd highest 24 hr average for 2015	35.8
	3 rd highest 24 hr average for 2015	35.6
	Annual average for 2015	17.6

Note: Bold values exceed the *Approved Methods* criteria.

No ambient air quality data for Total Suspended Particulates (TSP) is available from the referenced monitoring station. Therefore, the worst-case particle size distribution data from the AP-42 Emissions Database provided by the U.S. Environmental Protection Agency (US EPA, 1995), a PM₁₀-to-TSP ratio of 0.51 was used to estimate the TSP background concentration level of 34.5 µg/m³ for an annual averaging period.

The data collected from Richmond air quality monitoring station shows elevated background levels of both PM_{2.5} and PM₁₀ that are just below the *Approved Methods* 24 hour average criterion of 25 µg/m³ for PM_{2.5} and 50 µg/m³ for PM₁₀. Although the annual average of PM₁₀ was within the criterion of 25 µg/m³, the annual average of PM_{2.5} during 2015 exceeded criterion of 8 µg/m³.



5. AIR QUALITY CRITERIA AND GUIDELINES

5.1 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) applies the following definitions relating to air pollution:

“Air pollution” means the emission into the air of any air impurity.

While “air impurity” includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists odours, and radioactive substances’

The following sections of this Act have most relevance to the site:

- *Section 124 Operation of Plant - other than domestic plant*

The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier’s failure:

- (a) to maintain the plant in an efficient condition, or*
- (b) to operate the plant in a proper and efficient manner.*

- *Section 126 Dealing with Materials*

(1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.

(2) In this section:

deal with materials means process, handle, move, store or dispose of the materials.

Materials includes raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.

- *Section 127 Proof of causing pollution*

To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.



- *Section 128 Standards of air impurities not to be exceeded*

(1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:

(a) The standard of concentration and the rate, or

(b) The standard of concentration or the rate.

Prescribed by the regulations in respect of any such activity or any such plant.

(2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.

- *Section 129 Standards of air impurities not to be exceeded*

(1) The occupier of any premises at which scheduled activities are carried on under the authority conferred by a licence must not cause or permit the emission of any offensive odour from the premises to which the licence applies.

(2) It is a defence in proceedings against a person for an offence against this section if the person establishes that:

(a) The emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of the licence directed at minimising the odour, or

(b) The only persons affected by the odour were persons engaged in the management or operation of the premises.

(3) A person who contravenes this section is guilty of an offence.

The proposed development is required to comply with this Act.

5.2 PROTECTION OF ENVIRONMENT OPERATIONS (CLEAN AIR) REGULATION 2010

In accordance with Part 5 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* (herein referred to as the Clean Air Regulation), the proposed resource recycling facility would belong to Group 6 (Standards for scheduled premises) as the activity is to be “*commenced to be carried on, or to operate, on or after 1 September 2005 as a result of an environment protection licence granted under the Protection of the Environment Operations Act 1997 pursuant to an application made on or after 1 September 2005*”.



Schedule 4 of the Clean Air Regulation provides standards of concentration for scheduled premises general activities and plant, any crushing, grinding, separating or materials handling activity:

$$\text{Solid Particles (total)} = 20 \text{ mg/m}^3$$

The facility would be required to meet the above standard of concentration.

5.3 ADOPTED CRITERIA & NSW ENVIRONMENT PROTECTION AUTHORITY GUIDELINES

The *Approved Methods* (EPA 2016) provides guidance on methodology and thresholds that are to be used for the air impact assessment of a proposed development. This air impact assessment has been conducted in accordance with this guideline. Assessable pollutants (along with their corresponding limits) are summarised in Table 5-1. These criteria are applied at the nearest existing or likely future off-site sensitive receptor

Table 5-1: Applicable Particulate Criteria at Sensitive Receptors from the NSW EPA Modelling Guidelines (*Approved Methods* 2016)

Pollutant	Averaging Period	Percentile	Concentration $\mu\text{g}/\text{m}^3$
Total Suspended Particulates (TSP)	Annual	100 th	90
PM ₁₀	24 Hours	100 th	50
	Annual	100 th	25
PM _{2.5}	24 Hours	100 th	25
	Annual	100 th	8



6. AIR QUALITY IMPACTS FROM CONSTRUCTION

The proposal involves the construction of the compacted roadbase, large building, small office building, stockpile bays, landscaped areas and driveways, internal road and installation of the weigh bridge. Demolition is not required; however excavation to level the site will occur. The construction activities have the potential to generate dust. The northern area of the site will require fill to be introduced to form a platform for the site activities.

The following control measures are provided as suggestions only and may be implemented where appropriate. Local weather conditions should be taken into account in determining the level and suitability of controls required.

Recommended Controls:

- Consider timing of demolition with regards to wind speed and direction;
- Use of water sprays and dust suppression surfactants regularly where there is a risk of dust being generated;
- Securely cover skips and minimise drop heights of materials;
- Minimise the time materials/wastes are stockpiled on site;
- Limit stockpile height and size;
- Locate stockpiles away from sensitive receptors;
- Position stockpiles near existing wind breaks such as trees, fences, earth banks;
- Install physical barriers e.g. screens, fences;
- Wet suppression of stockpiled materials as needed to ensure no visible dust emissions;
- Covering/tarpping of stockpiles – this may include the use of mulch temporarily laid over the stockpile;
- Use wet cleaning methods or mechanical road sweepers to prevent the build-up of dusts on site road surfaces;
- Cover all loads entering and leaving the site;
- Vehicles leaving the site to be cleaned of dirt and other materials to avoid tracking these materials onto public roads; and
- Minimise area of soil disturbance.



7. AIR IMPACT ASSESSMENT

This section assesses the effects of potential emissions on the existing ambient air quality as a direct result of the proposal. The assessment methodology, modelling configurations, results and discussion of the potential impacts as well as any recommendations on mitigation measures are described in detail, as follows.

7.1 EMISSION SOURCES

The main air emissions typical of a resource recovery facility include dust and particulates (PM_{10} , $PM_{2.5}$, and total suspended particulates (TSP)). There will be no odour emissions associated with the proposed development as none of the materials stored on-site and none of the processes undertaken are odour-generating. Therefore, odour does not warrant any further assessment.

The air emission sources associated with the proposed development are listed below.

- Front end loader handling of materials;
- Material screening and crushing;
- Unloading materials;
- Loading materials; and
- Wind erosion of stockpiles.

Wheel generated dust has not been considered as a significant source of emissions. All vehicle paths will be lined with compacted road base materials, which will reduce dust. Trucks will also only achieve minimal speeds on the site. Hence, wheel generated dust emissions are adequately controlled.

7.1.1 Mitigation and Monitoring Measures

The following mitigation measures will be implemented at the subject site:

- Crushing and screening occurs within the main building;
- Stockpiles are stored in walled bays and use water sprays; and
- Truck wash facilities are present on site.

7.2 ADOPTED EMISSION FACTORS

The following emission factors from the NPI EETM for Mining (2012) and NPI EETM for Mining and Processing of Non-Metallic Minerals (2014) were utilised in this assessment to represent the site's activities. The relevant NPI documents do not include data for estimating emission of $PM_{2.5}$.

The *Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emissions Factors* (2006) gives a ratio of $0.15 PM_{2.5}/PM_{10}$ for 'Aggregate Handling and Storage Piles' which was used to estimate $PM_{2.5}$ emissions for wind erosion from external stockpiles and loading/unloading processes.



The US EPA AP-42 *Appendix B.2 Generalized Particle Size Distributions* (1996) data for 'Mechanically Generated Processed Ores and Non-metallic Minerals' gives a ratio of 0.35 PM_{2.5}/PM₁₀ which was used to estimate PM_{2.5} emissions from crushing and screening activities.

Table 7-1: Emission Factors

Location	Reference (NPI EETM)	Source	PM _{2.5} Emission Factor (kg/tonne)	PM ₁₀ Emission Factor (kg/tonne)	TSP Emission Factor (kg/tonne)
Inside building	Mining and Processing of Non-Metallic Minerals	Screening	0.00151	0.0043	0.0125
Inside building	Mining and Processing of Non-Metallic Minerals	Crushing	0.00042	0.0012	0.0027
Inside building	Mining and Processing of Non-Metallic Minerals	Unloading	0.000001	0.000008	0.00002*
Inside building & Outside	Mining	Wind Erosion from Stockpiles	0.03 kg/ha/hr	0.2 kg/ha/hr	0.4 kg/ha/hr
Outside	Mining and Processing of Non-Metallic Minerals	Loading	0.00001	0.00005	0.00010*
Outside	Mining	Front End Loader	0.0018	0.012	0.025

*No TSP data available in NPI. As materials are made up of a variety of products (bricks, concrete, timber, metal, glass) a generic PM₁₀ to TSP ratio of 0.51 has been assumed to estimate TSP emission factors.

7.2.1 Reduction Factors

The following reduction factors were utilised as per the NPI EETM for Concrete Batching and Concrete Product Manufacturing, materials handling and the NPI EETM for Mining, control factors for mining operations.

- A reduction factor of 0.1 has been applied to activities undertaken within the building (enclosure 2 or 3 walls).
- A total reduction factor of 0.35 has been applied to the external stockpiles. This includes a factor of 0.5 for water sprays and 0.7 for wind breaks used in conjunction.

Table 7-2 and Table 7-3 shows the updated emission factors used for this assessment.



7.3 EMISSION RATES

All dust generating activities that occur within the building have been cumulatively modelled as a volume source from the building. Wind erosion from the stockpiles has been modelled as an area source, adopting the approximate area of the surface as being 497.3 m².

It has been conservatively assumed that 100% of the total materials are to be crushed and screened.

As is the nature of waste transfer facilities, the amount of waste processed on a daily basis can fluctuate depending on supply. Therefore we have conservatively assumed a maximum quantity of materials to be processed in one day as 115 tonnes. This quantity has been adopted in order to more accurately predict the peak emission rates for PM_{2.5} and PM₁₀ under a 24 hour averaging period.

Sources within the building are assumed to be emitting for the duration of the proposed operating hours, being Monday to Friday, 7am to 6pm and Saturday 8am to 4pm. Wind erosion from the stockpiles is assumed to be emitting 24/7.

The emission rates for each source were estimated using the following equation by multiplying the emission factors previously discussed by the quantity of materials handled at the relevant activities for the corresponding activity period of time. Appropriate reduction factors were then applied.

$$ER = \frac{1000 \times EF \times Q \times RF}{OpHrs}$$

Where:

ER = Emission Rate (g/s)

EF = Emission Factor (kg/tonne)

OpHrs = Annual operational time (s/year) or (s/day)

Q = Materials processed (tonnes/year) or (tonnes/day)

RF = Reduction Factor (if applicable)

Note: if Emission Factor is kg/ha/hr, then Q = Area (ha)

7.3.1 Assumptions

The following assumptions were used in the model:

- The total of 20,000 tonnes per annum of raw material processed was used to estimate emissions from the subject site for the annual emissions of the Loading, Unloading, Front end Loader, Crusher and Screener sources;
- The maximum peak daily processed (crushed & screened) material usage of 115 tonnes of materials was used to estimate emissions from the subject site for the daily emissions of the Loading, Unloading, Front end Loader, Crusher and Screener sources;
- Stockpiles were assumed to occupy 497.3 m² outside and 530 m² inside the building. Stockpiles outside were modelled for 24 hours per day and 365 days per year. The same emission rate and area size were used to estimate both annual and 24 hours emissions for both stockpiles; and



- All other sources were modelled for the business hours of Monday to Friday 7am to 6pm and Saturday 8am to 4pm.

7.4 SOURCE CONFIGURATIONS AND PARAMETERS

The modelled emission rates for PM_{2.5}, PM₁₀ and TSP are given in Table 7-2 and Table 7-3 for the annual and 24 hour averaging periods respectively.

Table 7-2: Emission Rates – Annual Averaging Period

Source	Size	Release height	PM _{2.5} Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)	TSP Emission Rate (g/s)
Building	L: 45.63 m W: 45.63 m H: 6 m	6 m	3.71E-04	1.23E-03	3.17E-03
Loading	L: 4 m W: 4 m H: 3 m	3 m	1.27E-05	8.48E-05	1.66E-04
Front End Loader	L: 4 m W: 4 m H: 3 m	3 m	3.05E-03	2.04E-02	4.24E-02
Outside Stockpiles	497.3 m ²	0 m	1.45E-04	9.67E-04	1.93E-03

Table 7-3: Emission Rates – 24 Hour Averaging Period

Source	Size	Release height	PM _{2.5} Emission Rate (g/s)	PM ₁₀ Emission Rate (g/s)
Building	L: 45.63 m W: 45.63 m H: 6 m	6 m	6.04E-04	1.89E-03
Loading	L: 4 m W: 4 m H: 3 m	3 m	2.18E-05	1.45E-04
Front End Loader	L: 4 m W: 4 m H: 3 m	3 m	5.23E-03	3.48E-02
Outside Stockpiles	497.3 m ²	0 m	1.45E-04	9.67E-04

Emissions from the building have been modelled as a volume source assumed to be released at a height of 6 m, which is the approximate height of the open roller doors.

Emissions from the stockpiles have been modelled as an area source with a release height for the stockpiles is 0 m above the ground. The stockpiles would in practice vary in height; however a lower release height has been conservatively adopted as it results in higher concentrations at



receptors. Note that as the stockpile source is based on surface area, the emission rate remains the same for both annual averaging and peak 24 hour averaging.

Figure 7-1: Arrangement of Modelled Sources





8. AIR IMPACT MODELLING

8.1 DISPERSION MODEL

The new generation air dispersion model, AERMOD ver. 18081, was used for the prediction of off-site impacts associated with the air emissions from the proposed operations. AERMOD uses air dispersion based on planetary boundary layer turbulence structure and scaling concepts. The AERMOD model replaced AUSPLUME as the air dispersion model accepted by the Victorian EPA in January 2014 and is a suitable model to use for this air assessment.

The model was used to estimate the concentration impacts on receptors for each hour of input meteorology. Terrain was assumed to be elevated.

8.1.1 Meteorological Data

Prognostic meteorological data for the year 2015 were obtained from Lakes Environmental Services and pre-processed using AERMET, as described in Section 5.1. The resultant upper air and surface data files were input to AERMOD.

8.2 AIR IMPACT MODELLING RESULTS

Table 8-1 to Table 8-5 provide the results of the maximum modelled impacts for each identified receptor. Isopleths for each averaging period are provided in Figure 8-1 to Figure 8-5.

Background concentrations that exceed the relevant *Approved Methods* criterion are marked with red text.

8.2.1 Maximum Impact

Table 8-1: TSP Annual Averaging Period Modelling Results

Receptor ID	Incremental ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Maximum Impact ($\mu\text{g}/\text{m}^3$)	Criteria ($\mu\text{g}/\text{m}^3$)
R1	0.01	34.5 $\mu\text{g}/\text{m}^3$	34.51	90 $\mu\text{g}/\text{m}^3$
R2	0.01		34.51	
R3	0.01		34.51	
R4	0.01		34.51	
R5	0.01		34.51	
R6	0.09		34.59	
R7	0.10		34.60	
R8	0.05		34.55	
R9	0.03		34.53	
R10	0.04		34.54	
R11	0.07		34.57	
R12	0.05		34.55	

Note: **Complies** / **Non-compliance**

Figure 8-1: TSP Annual Averaging Period Modelling Results

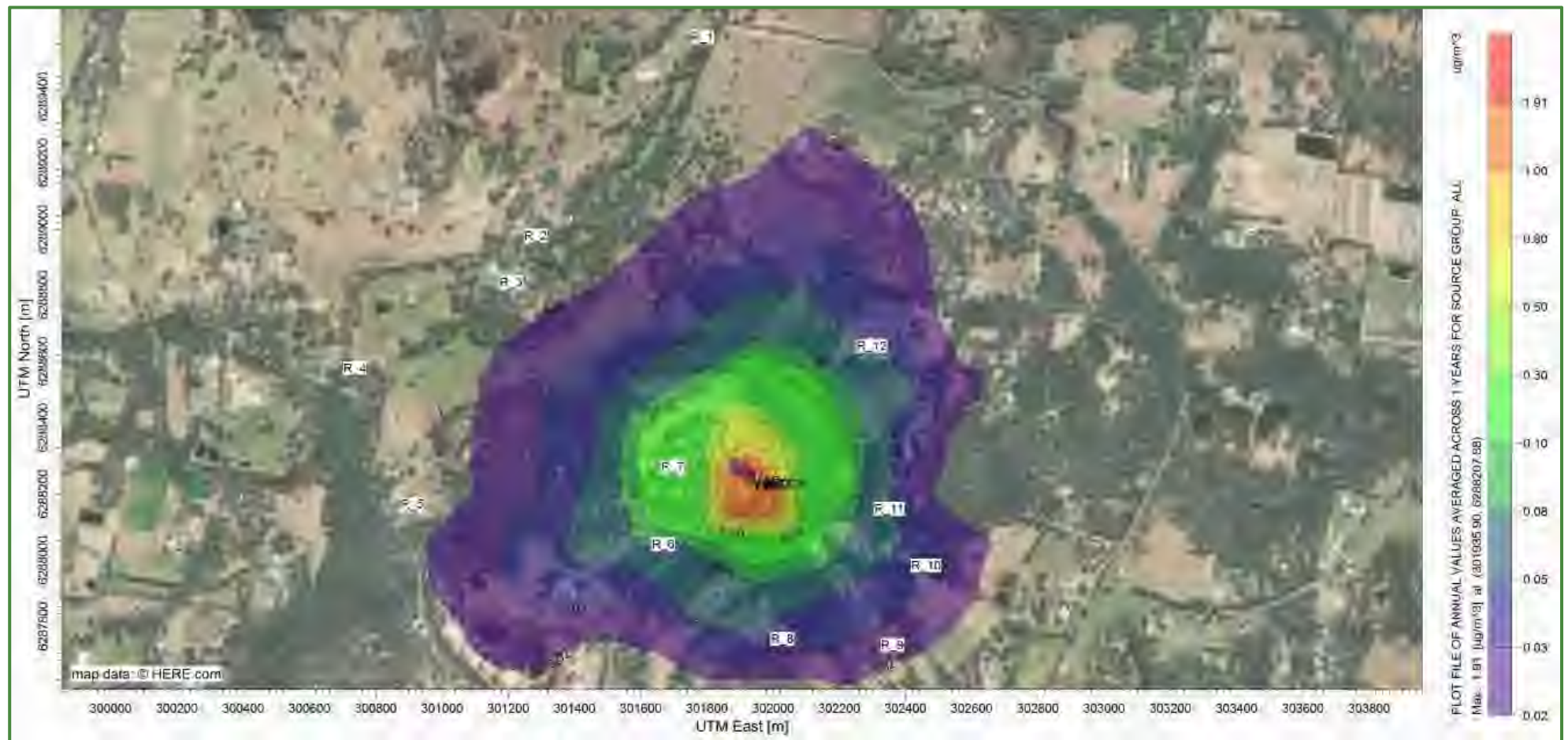




Table 8-2: PM₁₀ Annual Averaging Period Modelling Results

Receptor ID	Incremental Impact (µg/m ³)	Background (µg/m ³)	Cumulative Impact (µg/m ³)	Criteria (µg/m ³)
R1	0.00	17.6 µg/m ³	17.60	25 µg/m ³
R2	0.00		17.60	
R3	0.01		17.61	
R4	0.00		17.60	
R5	0.01		17.61	
R6	0.04		17.64	
R7	0.05		17.65	
R8	0.02		17.62	
R9	0.01		17.61	
R10	0.02		17.62	
R11	0.04		17.64	
R12	0.02		17.62	

Note: Complies / Non-compliance

Figure 8-2: PM₁₀ Annual Averaging Period Modelling Results

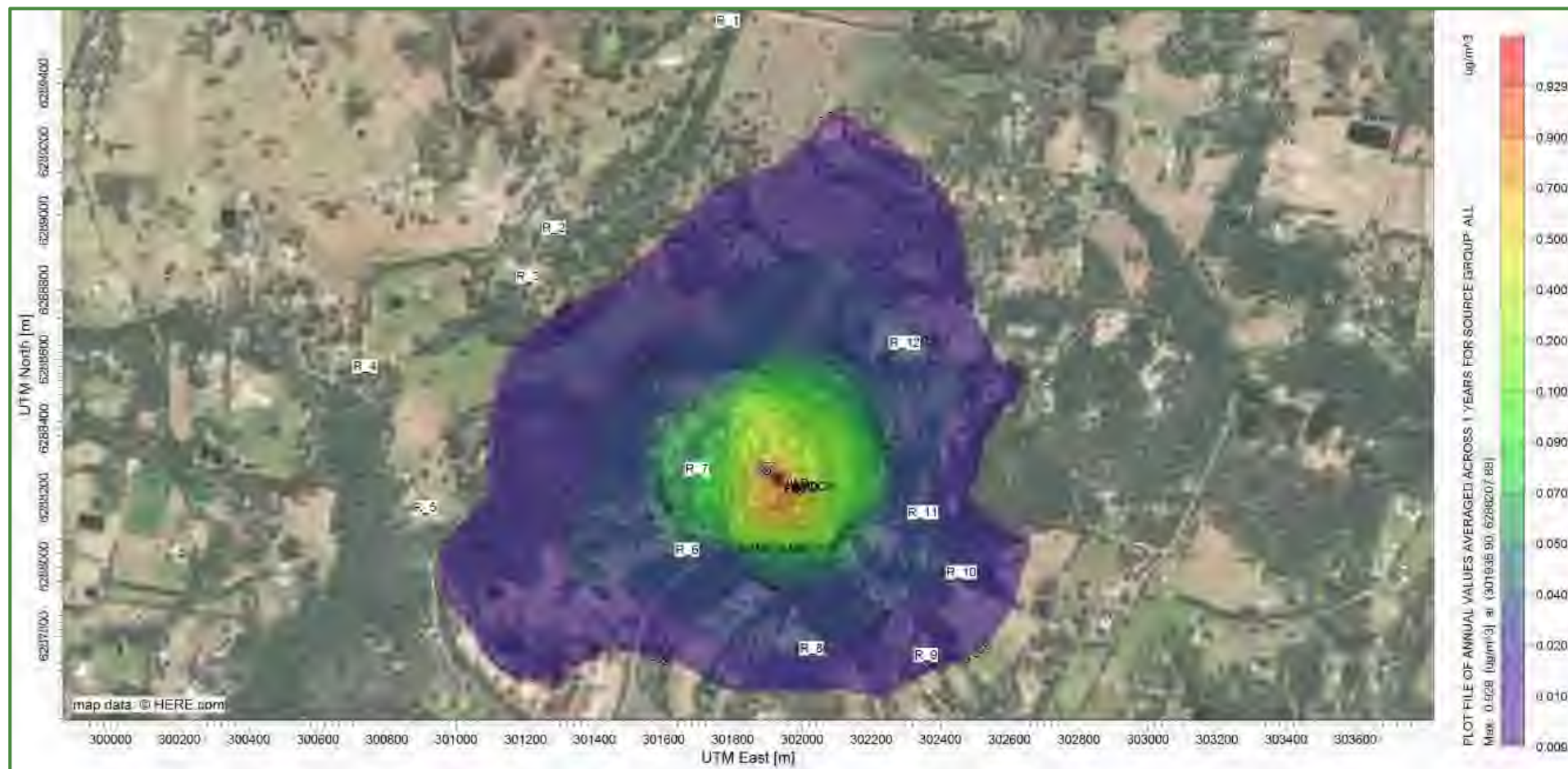




Table 8-3: PM_{2.5} Annual Averaging Period Modelling Results

Receptor ID	Incremental Impact (µg/m ³)	Background (µg/m ³)	Cumulative Impact (µg/m ³)	Criteria (µg/m ³)
R1	0.00	8.2 µg/m ³	8.20	8 µg/m ³
R2	0.00		8.20	
R3	0.00		8.20	
R4	0.00		8.20	
R5	0.00		8.20	
R6	0.01		8.21	
R7	0.01		8.21	
R8	0.00		8.20	
R9	0.00		8.20	
R10	0.00		8.20	
R11	0.01		8.21	
R12	0.00		8.20	

Note: Complies / Non-compliance

Figure 8-3: PM_{2.5} Annual Averaging Period Modelling Results

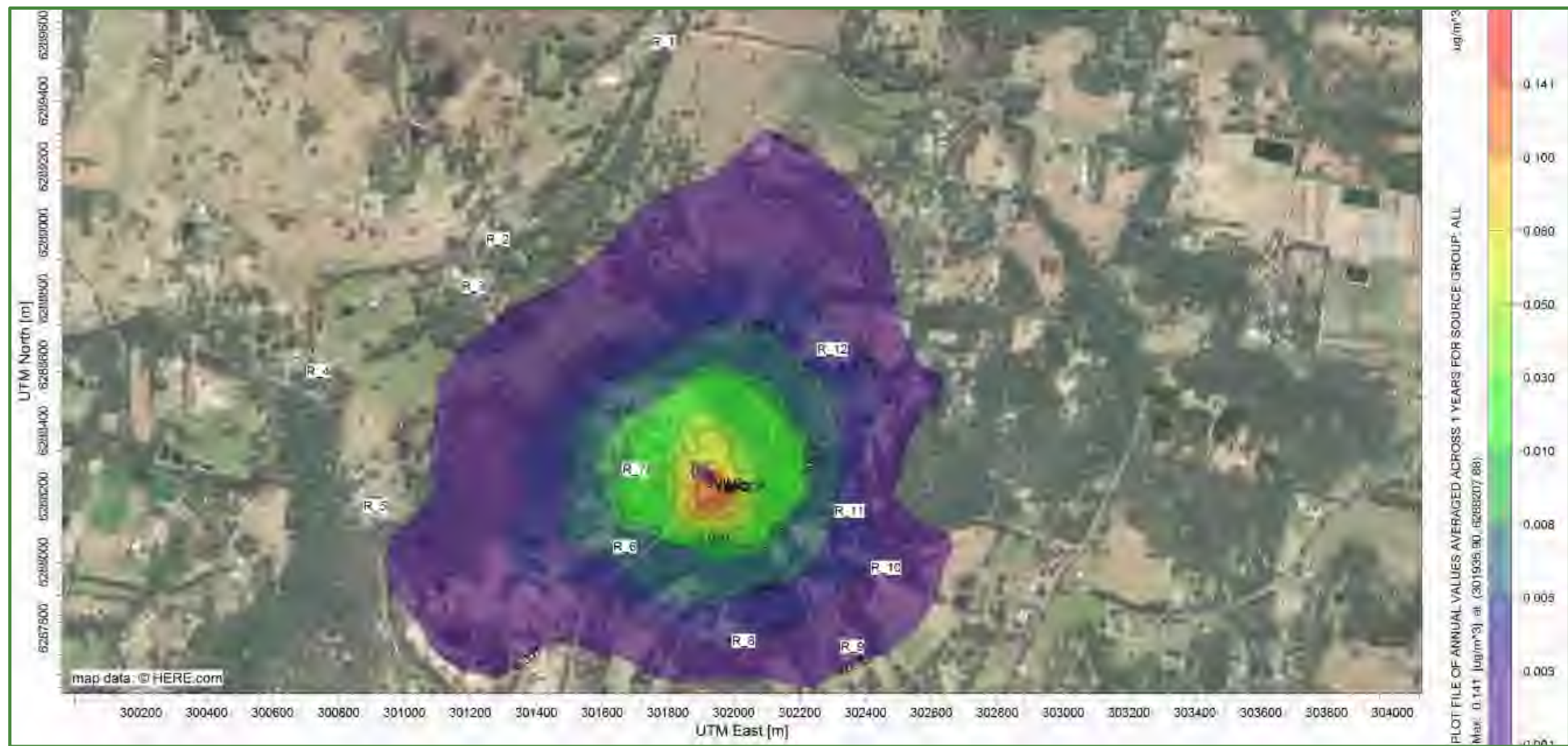




Table 8-4: PM₁₀ 24 Hour Averaging Period Modelling Results

Receptor ID	Incremental Impact (µg/m ³)	Background (µg/m ³)	Cumulative Impact (µg/m ³)	Criteria (µg/m ³)
R1	0.08	49.3 µg/m ³	49.38	50 µg/m ³
R2	0.34		49.64	
R3	0.50		49.80	
R4	0.20		49.50	
R5	0.22		49.52	
R6	0.99		50.29	
R7	1.15		50.45	
R8	0.40		49.70	
R9	0.27		49.57	
R10	0.48		49.78	
R11	0.90		50.20	
R12	0.32		49.62	

Note: Complies Non-compliance

Figure 8-4: PM₁₀ 24 Hour Averaging Period Modelling Results

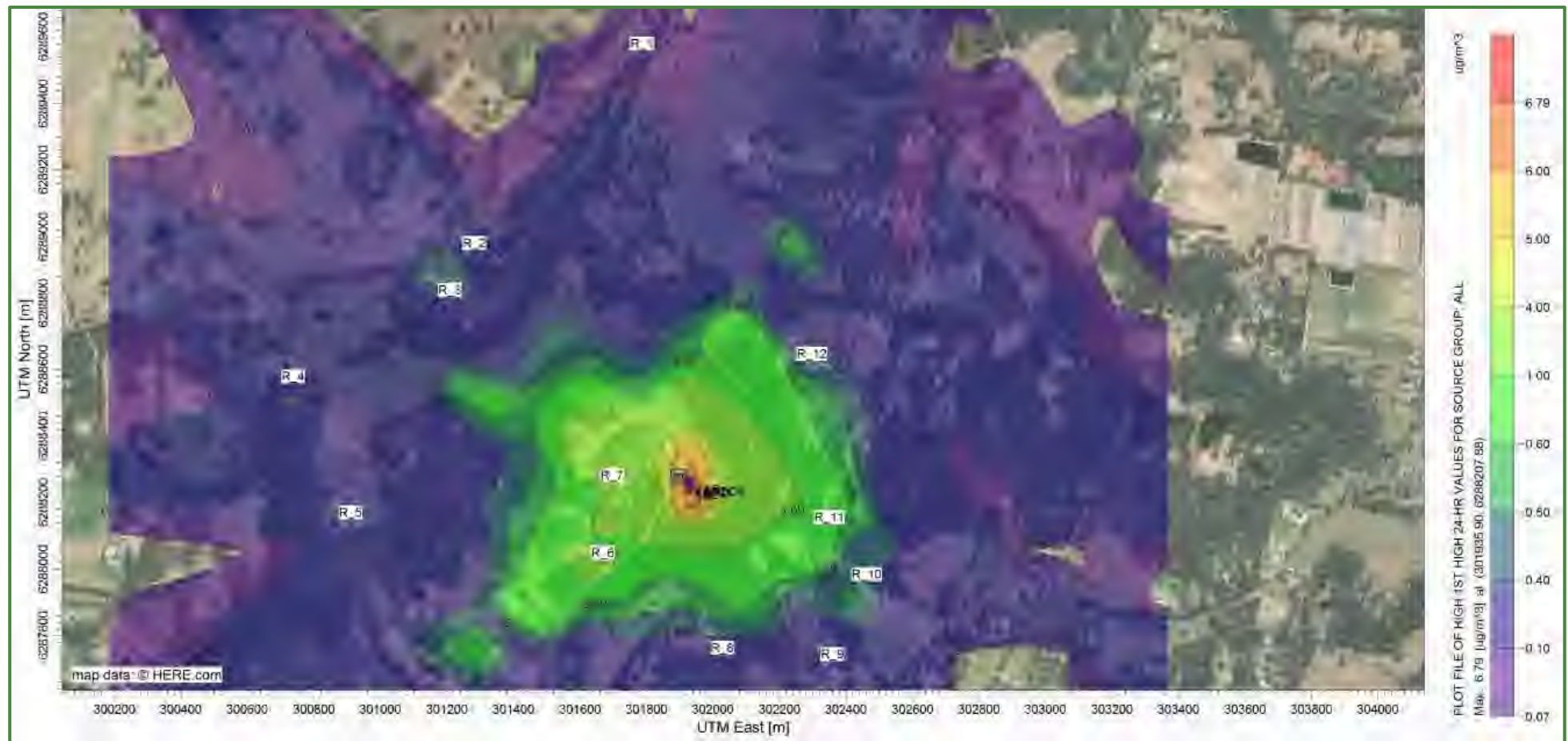


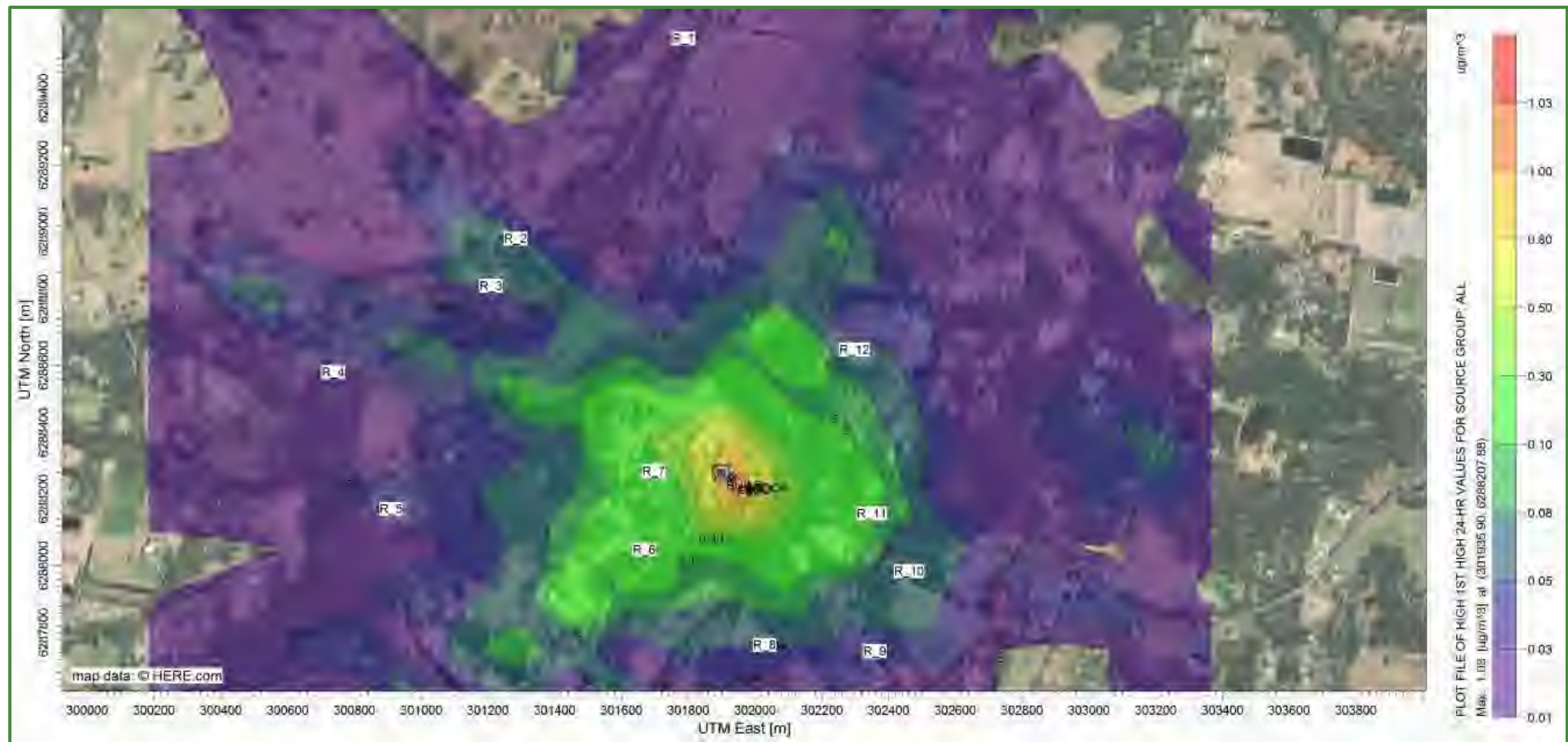


Table 8-5: PM_{2.5} 24 Hour Averaging Period Modelling Results

Receptor ID	Incremental Impact (µg/m ³)	Background (µg/m ³)	Cumulative Impact (µg/m ³)	Criteria (µg/m ³)
R1	0.01	24.5 µg/m ³	24.51	25 µg/m ³
R2	0.05		24.55	
R3	0.08		24.58	
R4	0.03		24.53	
R5	0.03		24.53	
R6	0.17		24.67	
R7	0.19		24.69	
R8	0.06		24.56	
R9	0.04		24.54	
R10	0.07		24.57	
R11	0.14		24.64	
R12	0.05		24.55	

Note: Complies Non-compliance

Figure 8-5: PM_{2.5} 24 Hour Averaging Period Modelling Results





8.2.2 Contemporaneous Impact and Background

Due to the exceedance attributed to high daily background levels of PM₁₀ at the site, the *Approved Methods* require a demonstration that no additional exceedances of the impact assessment criteria will occur as a result of the proposed site activities.

Table 8-6 summarise the contemporaneous impact and background of the top eight days of highest background concentrations and the top eight days of highest predicted increment for PM₁₀ for the closest residential receptor (R7). Any additional days where the *Approved Methods* criteria are exceeded are marked in bold.

Table 8-6: Summary of Top Eight Days of Contemporaneous PM₁₀ Impact and Background at Residential Receptor R7 (*Approved Methods* Criterion = 50 µg/m³)

Date	PM ₁₀ 24 Hour Average (µg/m ³)			Date	PM ₁₀ 24 Hour Average (µg/m ³)		
	Highest Background	Predicted Increment	Total		Background	Highest Predicted Increment	Total
06/05/2015	49.3	0.03	49.33	03/07/2015	12.0	1.15	13.15
26/11/2015	35.8	0.04	35.84	03/06/2015	9.3	0.88	10.18
27/11/2015	35.6	0.09	35.69	18/05/2015	15.8	0.72	16.52
12/12/2015	31.7	0.05	31.75	26/05/2015	14.0	0.63	14.63
21/08/2015	30.3	0.00	30.3	07/07/2015	16.0	0.57	16.57
19/08/2015	27.5	0.09	27.59	27/05/2015	17.8	0.55	18.35
22/08/2015	27.3	0.05	27.35	29/05/2015	12.3	0.45	12.75
10/03/2015	27.2	0.06	27.14	26/06/2015	9.1	0.45	9.55

Note: Complies Non-compliance

8.3 DISCUSSION OF MODELLING RESULTS

The maximum predicted impacts for the annual averaging period TSP comply with the *Approved Methods* criterion of 90 µg/m³ at all sensitive receptors.

The maximum predicted impact for the annual averaging period for PM_{2.5} does not comply with the criterion of 8 µg/m³. As the maximum predicted increment is 0.01 µg/m³, this non-compliance is attributed to the annual background levels of 8.2 µg/m³ that already exceed. The impacts from site activities are considered to be negligible. The maximum predicted impacts for the 24 hour averaging period of PM_{2.5} complies with the criterion of 25 µg/m³ at all sensitive receptors.

The maximum predicted impacts for the annual averaging period of PM₁₀ comply with the *Approved Methods* criterion of 50 µg/m³ at all sensitive receptors. The maximum predicted impacts for the 24 hour averaging period of PM₁₀ exceed the criterion of 50 µg/m³ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolora Road, Ebenezer) with impacts of 50.29 µg/m³, 50.45 µg/m³, 50.2 µg/m³ respectively. This is attributed to elevated daily background concentrations.



In cases of elevated background concentrations, the NSW EPA requires a demonstration that no additional daily exceedances of the impact assessment criteria will occur as a result of the proposed site activities. Contemporaneous addition of the predicted daily increments of PM₁₀ with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM₁₀ would result due to the proposed site activities.

Dust control measures are proposed for the site activities and are considered effective as detailed in section 7.1.1. No further controls are recommended.

In keeping with NSW EPA current guidelines, crushing and screening would take place within a building. Extensive use of water sprays would occur. Water would be rain harvested or purchased as needed.



9. STATEMENT OF POTENTIAL AIR QUALITY IMPACTS

TSP and PM₁₀ emissions at all sensitive receptors were predicted to comply with the *Approved Methods* criterion for an annual averaging period. Emissions of PM_{2.5} do not comply with the annual criterion of 8 µg/m³. This is attributed to the annual background levels that already exceed the criteria. The maximum predicted increment is 0.01 µg/m³, this impact is considered to be negligible.

The maximum predicted impacts for the 24 hour averaging period of PM₁₀ exceed the criterion of 50 µg/m³ at R6 (71 Sargents Road, Ebenezer), R7 (79 Sargents Road, Ebenezer) and R11 (96 Kolora Road, Ebenezer) with impacts of 50.29 µg/m³, 50.45 µg/m³, 50.2 µg/m³ respectively. This is attributed to elevated daily background concentrations.

Contemporaneous addition of the predicted daily increments of PM₁₀ with daily background levels for 2015 showed that at the closest sensitive receptor, R7, no additional days of exceedance for PM₁₀ would result due to the proposed site activities.

Dust control measures are proposed for the site activities and are considered effective. No further controls are recommended.

This concludes the report.



Kate Barker
Environmental Scientist



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Emma Hansma
Senior Engineer

R T Benbow
Principal Consultant



10. REFERENCES

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US EPA, 1995, *AP 42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources*

US EPA, 1996, *AP-42 Appendix B.2 Generalized Particle Size Distributions*



11. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

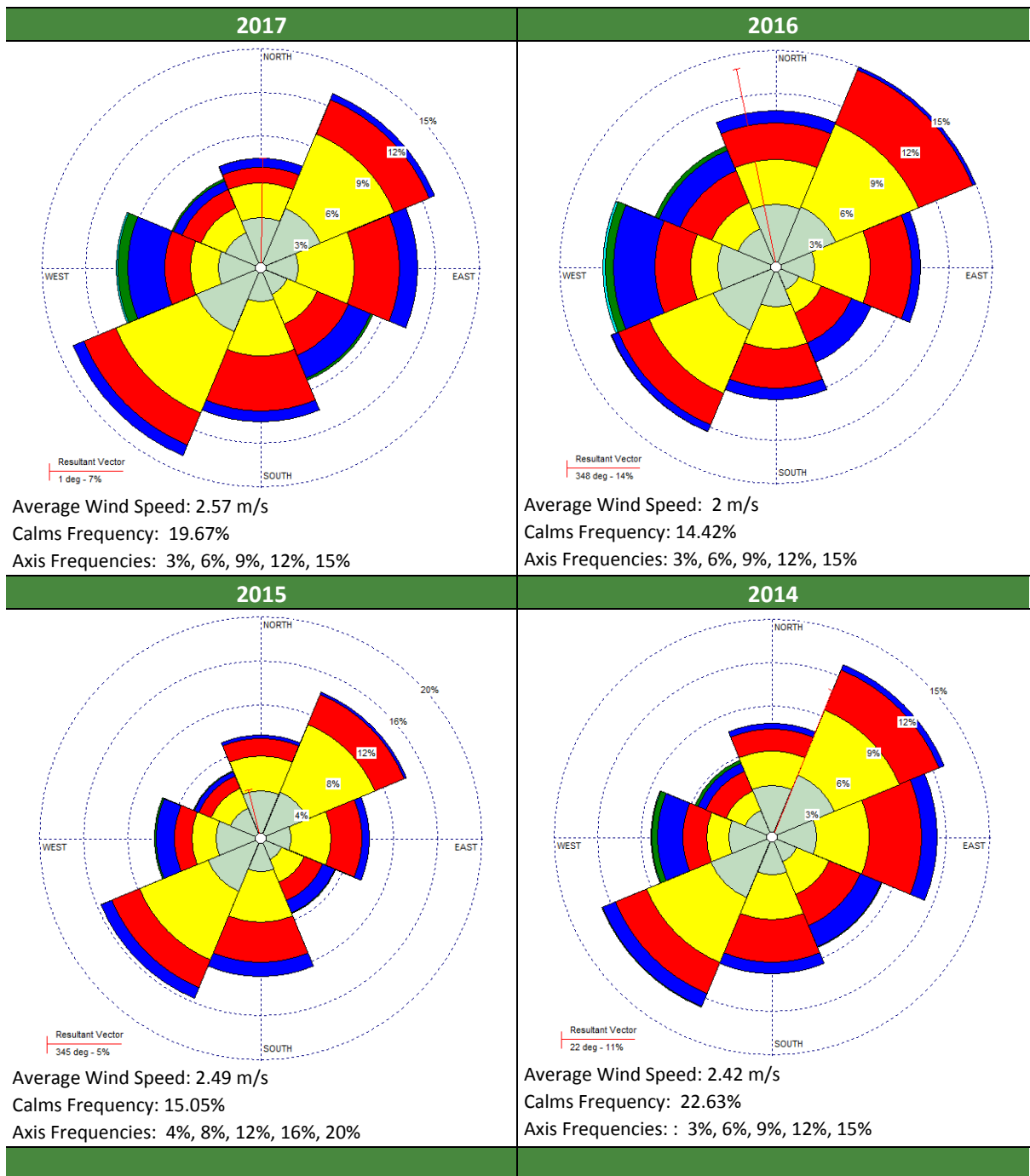
This report has been prepared solely for the use of Hala Constructions Pty Ltd, as per our agreement for providing environmental services. Only Hala Constructions Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Hala Constructions Pty Ltd for the purposes of preparing this report.

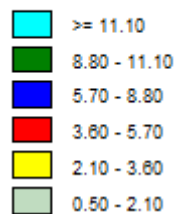
Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

Attachment 1: Wind Rose Plots for the Referenced Meteorological Station – Richmond RAAF,
Bureau of Meteorology 2014 – 2017.



WIND SPEED
(m/s)

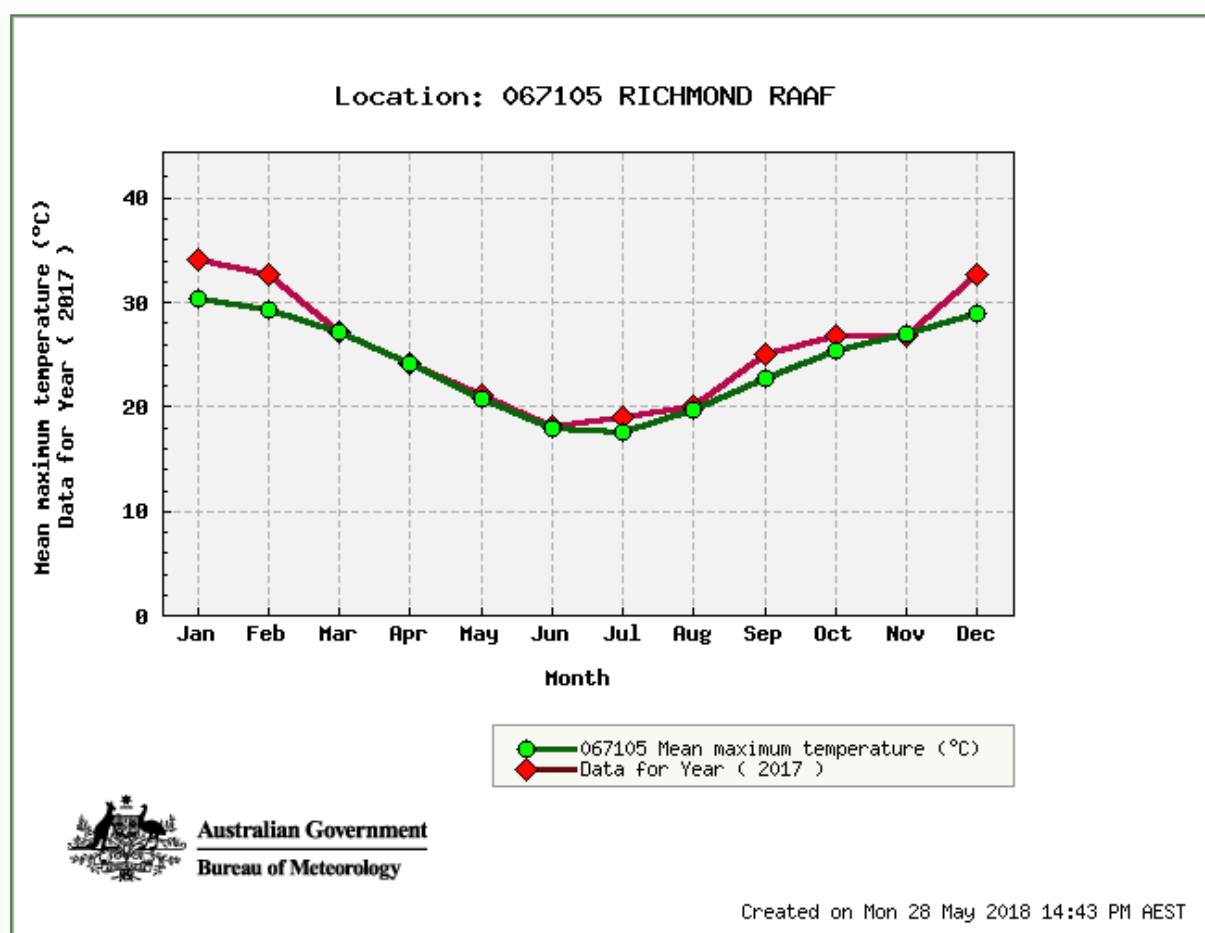


Attachment 2: Long-term Climate Statistics for the Referenced Meteorological Station –
Bankstown Airport, Bureau of Meteorology

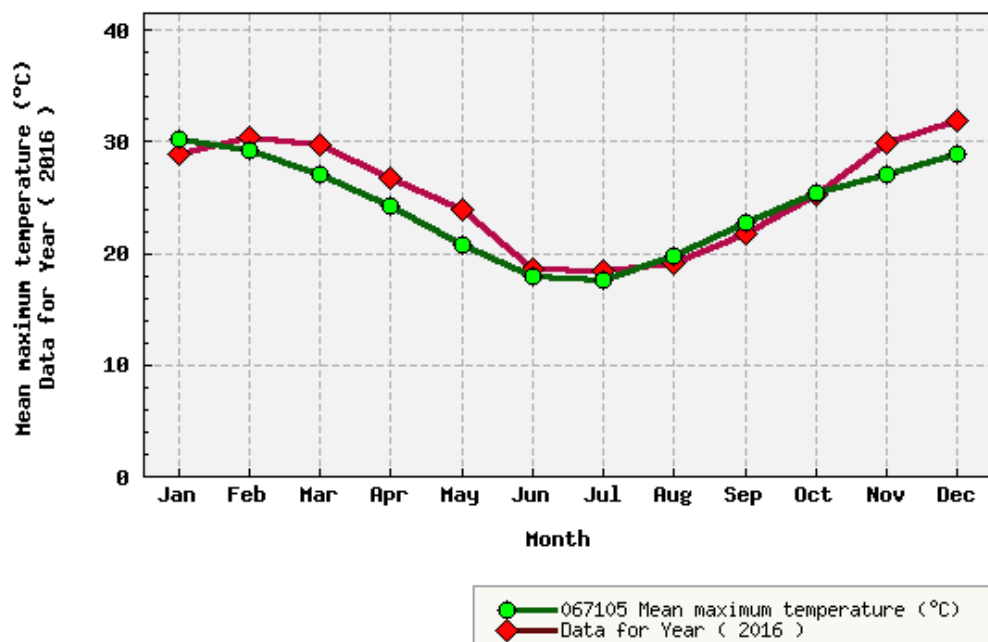
Representative Year

We have selected 2015 as the most representative year for weather. The maximum and minimum mean temperature follow the overall trend very closely in comparison to the years preceding 2018. Minimum mean temperatures for 2017 and 2016 show less of a smooth trend with anomaly spikes. For maximum temperatures in 2017 and 2016, the temperature tends to be quite a bit above the overall trend for several of the months in the year.

For mean daily wind run in 2015, the trend is followed more so than other years and it is the first year preceding 2018 to have complete data for the year. In 2017 there is 3 months worth of data missing for mean daily wind run and in 2016 there is 4 months of data missing. The wind run data for 2014 may follow the trend slightly more closely but data for December is missing.



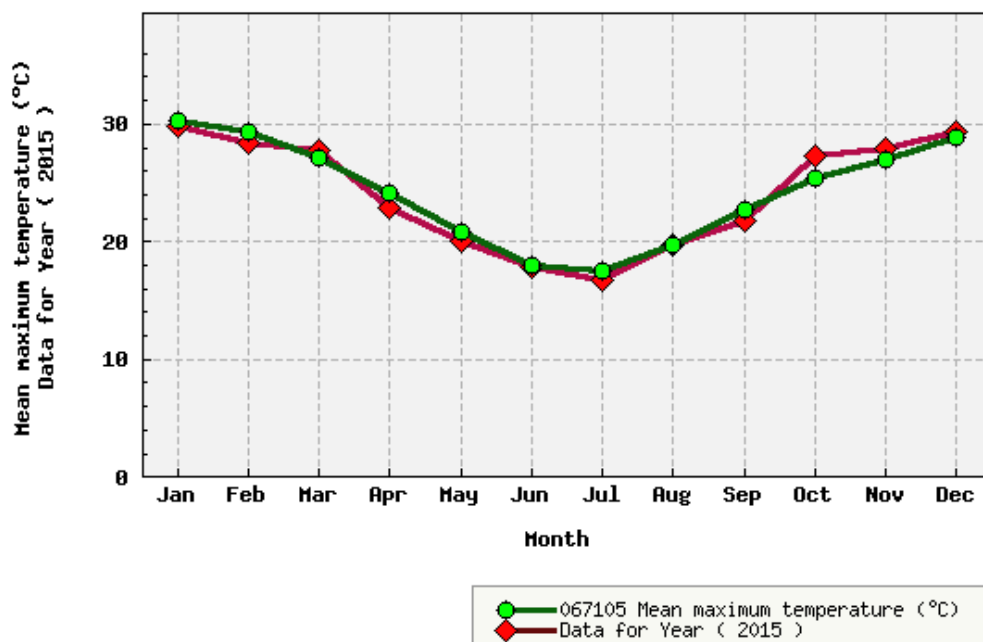
Location: 067105 RICHMOND RAAF



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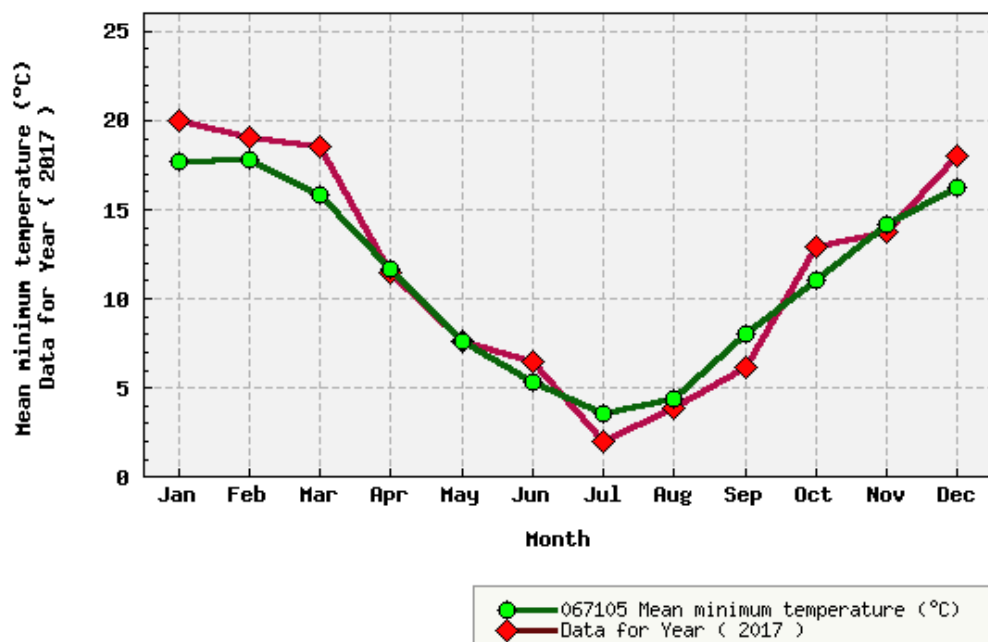
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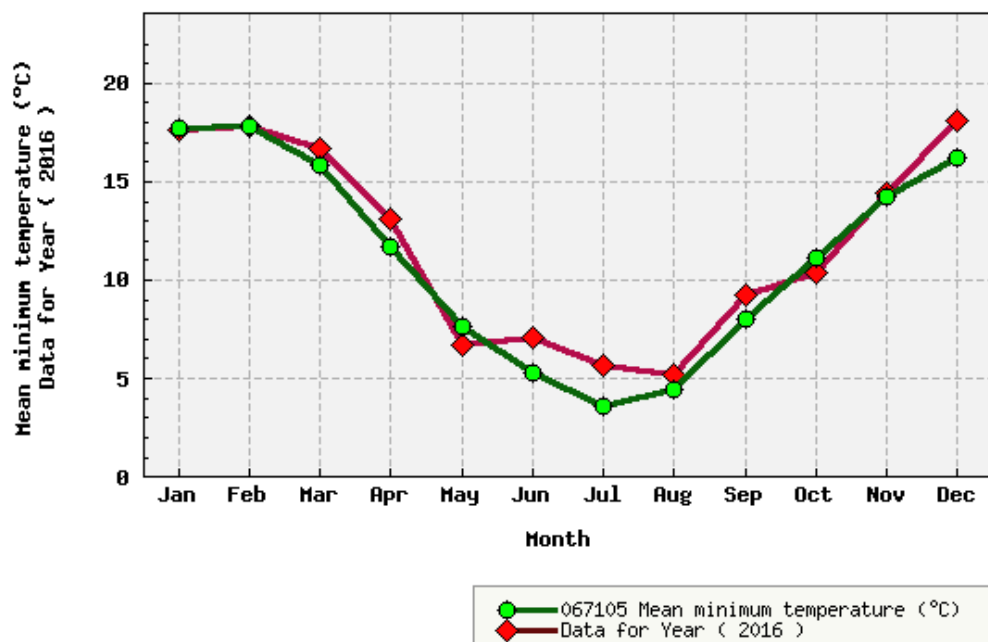
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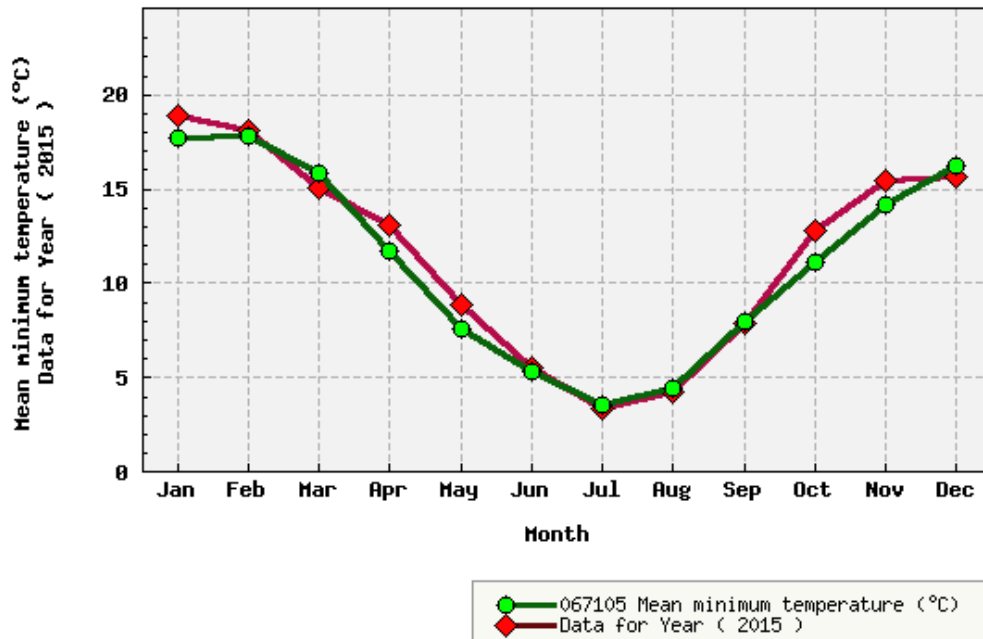
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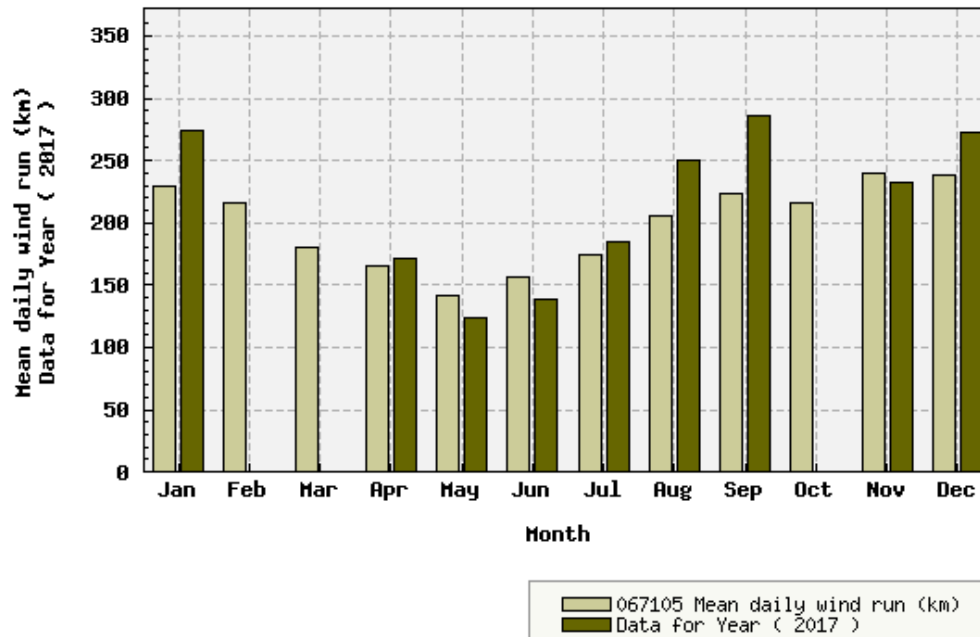
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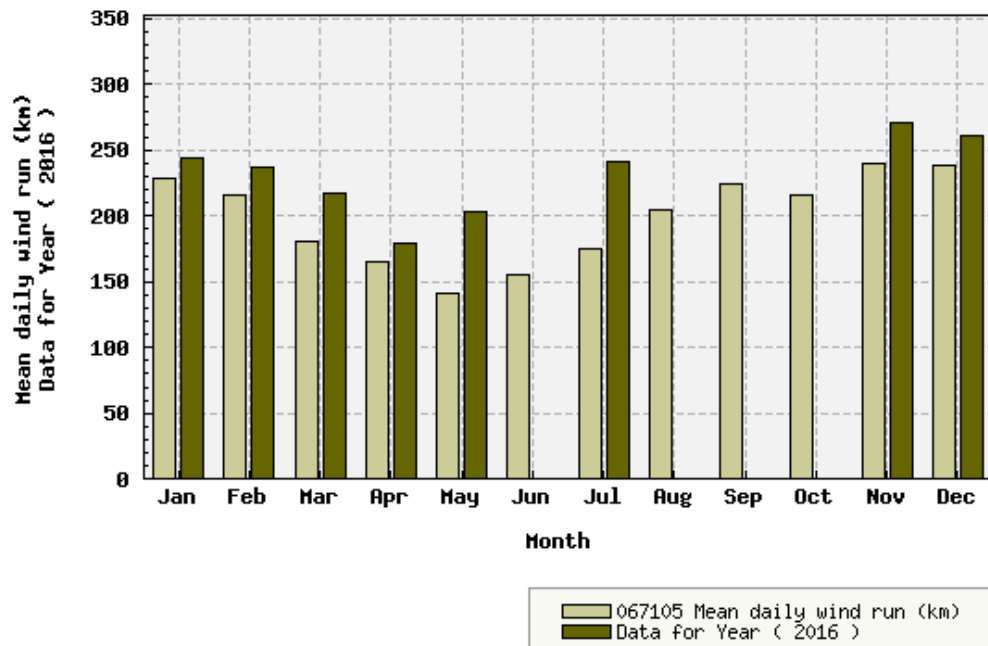
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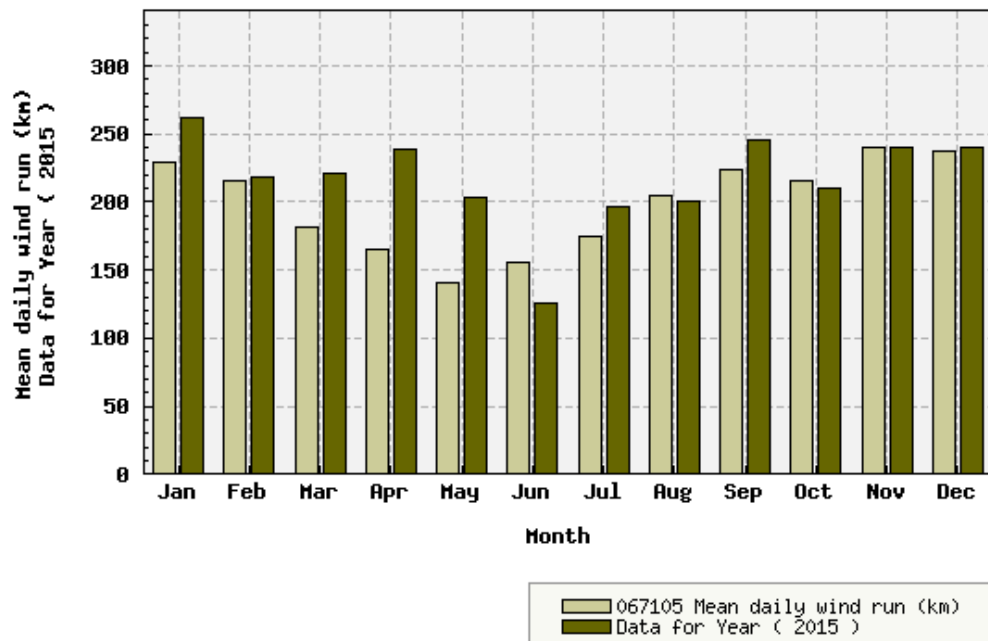
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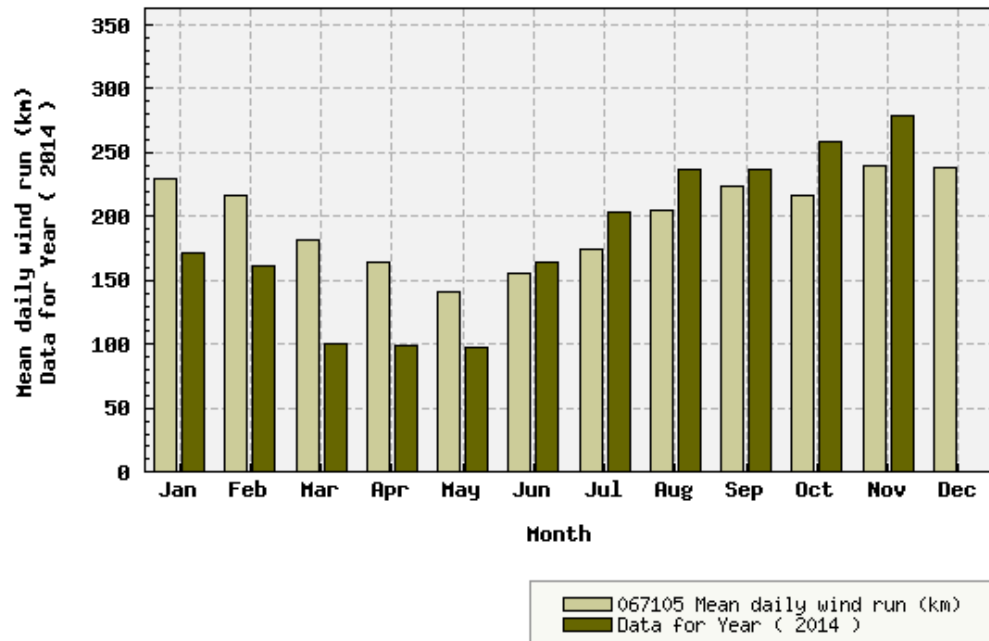
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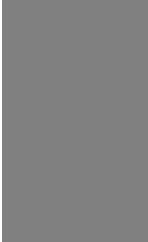
EIS Appendix 2: Noise Impact Assessment

**NOISE IMPACT ASSESSMENT
FOR HALA ALAMEDDINE
99 SARGENTS ROAD, EBENEZER**

Prepared for: Hala Alameddine, Hala Constructions Pty Ltd

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Report No: 181084_NIA_Rev3
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(Released: 07 August 2019)



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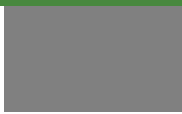
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EXECUTIVE SUMMARY

This document presents a noise impact assessment conducted by Benbow Environmental for the proposed landscape material supplies and resource recovery facility located at 99 Sargents Road, Ebenezer. The site is proposed to process and store virgin excavated natural materials (VENM), excavated natural materials (ENM) and construction and demolition (C&D) materials. Annual throughput of 20,000 tonnes per year is sought.

The nearest receivers and the noise generating activities have been identified. Noise criteria for the project have been formed, with assessment of the proposed site activities conducted against the NSW Noise Policy for Industry (EPA, 2017), NSW Interim Construction Noise Guideline (DECC, 2009) and the NSW Road Noise Policy (DECCW, 2011). Modelling of the activities was conducted using the noise modelling software SoundPlan.

This noise impact assessment finds that predicted noise levels will be below the criteria set out in accordance with the NSW Noise Policy for Industry at all receivers. Recommendations for noise controls are given in section 7.3, including operational hours and site management practices.

The generation of additional road traffic associated with the site's activities has been assessed and was predicted to comply with the guidelines set out in the NSW Road Noise Policy.

Construction activities are recommended to be limited to standard hours in accordance with the Interim Construction Noise Guideline.

This report concludes that following the carrying out of the recommendations in this report, the proposed site activities will comply with all considered noise criteria at all surrounding receptors.

Contents	Page
EXECUTIVE SUMMARY	I
1. INTRODUCTION	1
1.1 Scope of Works	1
2. PROPOSED DEVELOPMENT	2
2.1 Overview of Operations	2
2.2 Hours of Operations	2
2.3 Description of the Proposal	2
2.3.1 Site Description	2
2.3.2 Process Description	5
3. NEAREST SENSITIVE RECEPTORS	6
4. EXISTING ACOUSTIC ENVIRONMENT	8
4.1 Noise Monitoring Equipment and Methodology	8
4.2 Measurement Locations	9
4.3 Measured noise levels	9
4.3.1 Short Term Operator Attended Noise Monitoring Results	9
4.3.2 Long-Term Unattended Noise Monitoring Results	9
5. METEOROLOGICAL CONDITIONS	11
5.1 Wind Effects	11
5.1.1 Wind Rose Plots	11
5.1.2 Local Wind Trends	11
5.2 Temperature Inversions	15
5.2.1 Weather Conditions Considered in the Assessment	15
6. CURRENT LEGISLATION AND GUIDELINES	16
6.1 NSW EPA Noise Policy for Industry	16
6.1.1 Project Intrusiveness Noise Level	16
6.1.2 Amenity Noise Level	16
6.1.3 Sleep Disturbance Criteria	17
6.1.4 Project Noise Trigger Levels	17
6.2 NSW EPA Road Noise Policy	18
6.2.1 Vehicle Route	18
6.2.2 Road Category	18
6.2.3 Noise Assessment Criteria	18
6.2.4 Relative Increase Criteria	19
6.2.5 Assessment Locations for Existing Land Uses	19
6.2.6 Road Traffic Project Specific Noise Levels	20
6.3 Construction Noise and Vibration Criteria	20
6.3.1 NSW Interim Construction Noise Guideline	20
6.3.2 Vibration Criteria	22
6.3.3 BS 7385-2:1993	22
6.3.4 DIN4150-3:1999	23
6.3.5 Human Exposure	23
7. OPERATIONAL NOISE IMPACT ASSESSMENT	25

7.1	Modelling Methodology	25
7.1.1	Noise Model	25
7.1.2	Assumptions Made for Noise Modelling	25
7.1.3	Noise Sources	26
7.1.4	Noise Modelling Scenarios	26
7.2	Operational Predicted Noise Levels	28
7.3	Noise Control Measures	29
8.	ROAD TRAFFIC NOISE IMPACT ASSESSMENT	30
9.	CONSTRUCTION NOISE IMPACT ASSESSMENT	31
9.1	Construction Activities	31
9.2	Modelled Noise Generating Scenarios	31
9.3	Modelling Methodology	34
9.3.1	Noise Model	34
9.3.2	Noise Sources	35
9.4	Construction Predicted Noise Levels	35
10.	STATEMENT OF POTENTIAL NOISE IMPACT	37
11.	LIMITATIONS	38

Tables	Page
Table 3-1: Nearest Receivers	6
Table 4-1: Instrumentation and Setup Details	8
Table 4-2: Noise Monitoring Locations	9
Table 4-3: Operator Attended Noise Measurements, dB(A)	9
Table 4-4: Unattended Noise Monitoring Results, dB(A)	10
Table 5-1: Meteorological Conditions Assessed in Noise Propagation Modelling	15
Table 6-1: Amenity noise levels.	16
Table 6-2: Project Noise Trigger Levels (PNTL) for Operational Activities, dB(A)	18
Table 6-3: Road Traffic Noise Assessment Criteria For Residential Land Uses, dB(A)	19
Table 6-4: Assessment Locations for Existing Land Uses	19
Table 6-5: Project Specific Noise Levels Associated with Road Traffic, dB(A)	20
Table 6-6: Management Levels at Residences Using Quantitative Assessment	21
Table 6-7: Construction Noise Criterion dB(A)	22
Table 6-8: Vibration criteria for cosmetic damage (BS 7385:2 1993)	22
Table 6-9: Structural damage criteria heritage structures (DIN4150-3 1999)	23
Table 6-10: Preferred and maximum weighted rms z-axis values, 1-80 Hz	23
Table 7-1: A-weighted Sound Power Levels Associated with Operational Activities, dB(A)	26
Table 7-2: Modelled Noise Scenarios for Proposed Operations	27
Table 7-3: Noise Modelling Results Associated with Operational Activities, L_{eq} , dB(A)	29
Table 8-1: Predicted Levels for Road Traffic Noise	30
Table 9-1: Modelled Noise Stages for Proposed Construction Works	31
Table 9-2: A-weighted Sound Power Levels Associated with Construction Activities, dB(A)	35
Table 9-3: Noise Modelling Results Associated with Construction Activities for L_{eq} , dB(A)	36

Figures

Page

Figure 2-1: Site Layout	3
Figure 2-2: Shed Layout	4
Figure 3-1: Nearby Receptors	7
Figure 5-1: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Day time	12
Figure 5-2: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Evening time	13
Figure 5-3: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Night time	14
Figure 7-1: Noise Source Locations	28
Figure 9-1: Construction Stage 1 – Civil Works	32
Figure 9-2: Construction Stage 2 – Concreting Construction Works	33
Figure 9-3: Construction Stage 3 – Structure Construction Works	34

Attachments

- Attachment 1: Noise Glossary
- Attachment 2: Calibration Certificates
- Attachment 3: Noise QA/QC procedures





1. INTRODUCTION

Benbow Environmental has been engaged to undertake a noise impact assessment for the proposed landscape material supplies and resource recovery facility at 99 Sargents Road, Ebenezer.

The site is located within a RU1 Primary Production Zoning in Ebenezer, within Hawkesbury City Council. The nearest residential receptor is located adjacent to the southwest boundary of the site.

The site is proposed to house a landscaping supply and resource recovery facility using virgin excavated natural materials (VENM), excavated natural materials (ENM) and construction and demolition (C&D) materials. The materials will be sourced from excavations on sites where Hala Constructions operate, but will also be sourced from other sites. Screening and crushing of some of the materials is proposed to occur inside a shed on site.

Noise emissions from the site were predicted by using noise modelling software, SoundPlan.

This noise impact assessment has been prepared in accordance with the following guidelines and documents:

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

1.1 SCOPE OF WORKS

This noise impact assessment has been limited to the following scope of works:

- Site inspection and review of the proposed site operations;
- Short term attended noise measurements in accordance with relevant guidelines;
- Establish project specific noise levels;
- Determine all potential noise sources associated with the existing and proposed development;
- Collect required noise sources data;
- Predict potential noise impacts at the nearest potentially affected receptors to the site;
- Assess potential noise impacts against relevant legislation and guidelines;
- Recommend general ameliorative measures/control solutions (where required); and
- Compile this report with concise statements of potential noise impact.

To aid in the review of this report, supporting documentation has been referenced within this report. A glossary of terminology is included in Attachment 1.



2. PROPOSED DEVELOPMENT

2.1 OVERVIEW OF OPERATIONS

The proponent is seeking to establish a landscape material supplies business and resource recovery facility at 99 Sargents Road, Lot 288 DP 751665, Ebenezer.

The site is proposed to house a landscaping supply and resource recovery facility using virgin excavated natural materials (VENM), excavated natural materials (ENM) and C&D materials. The materials will be sourced from excavations on sites where Hala Constructions operate, but will also be sourced from other sites. Screening and crushing of some of the materials is proposed to occur inside a shed on site. An existing dwelling will be used for offices.

Trucks will enter the site from Sargents Road via a separate driveway and unload materials into the processing shed. Materials will be screened, crushed and sorted. Material will be transferred by front end loader to stockpiles on site. Materials will then be stored in stockpiles, or transferred out to market.

The stationary noise sources, including the screen and crusher are located inside the building. Mobile equipment such as trucks, the excavator and front end loader may be located inside or outside the building. Truck movements per day include up to 10 truck trips, or a maximum of 2 truck trips per hour.

2.2 HOURS OF OPERATIONS

The landscape facility is proposed to operate from Monday to Friday 7am to 6pm and Saturday from 8am to 4pm. The site is not proposed to operate on Sundays or Public Holidays.

2.3 DESCRIPTION OF THE PROPOSAL

2.3.1 Site Description

The proposal site is located at 99 Sargents Road, Ebenezer and is 15,000 m² (15 hectares) in size. Two dwellings and a number of sheds are located on the property. The land and surrounds are zoned RU1 Primary Production in the Hawkesbury City Council Local Environment Plan 2012.

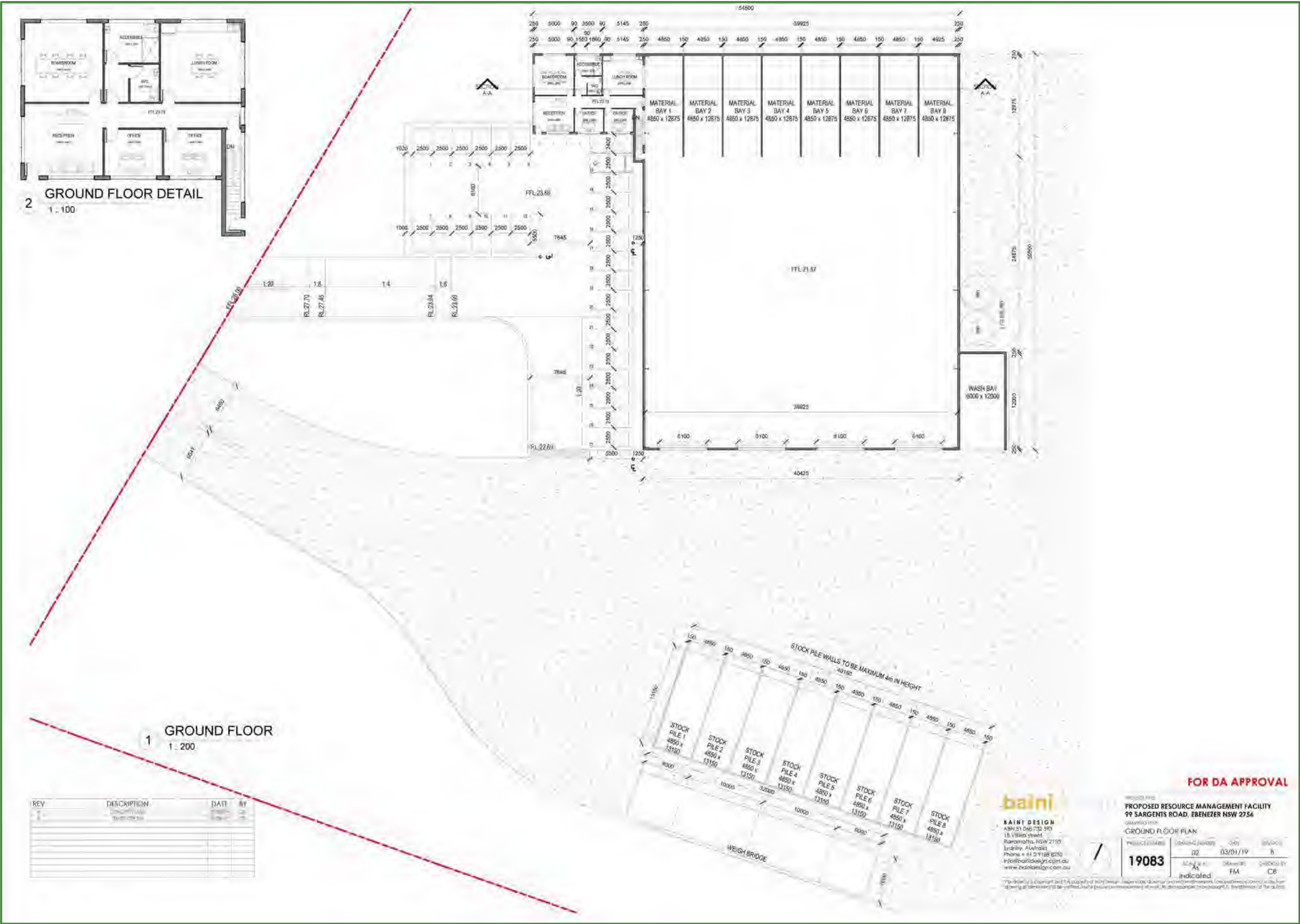
Unloading and processing is proposed to occur in the main shed located in the centre of the site. Trucks are proposed to enter and exit the site from Sargents Road.

A site layout plan of the proposed development within the 99 Sargents Road property is shown in Figure 2-1 and a shed layout shown in Figure 2-2.

Figure 2-1: Site Layout



Figure 2-2: Shed Layout





2.3.2 Process Description

The processes involved in the sorting operations are as follows:

- Trucks drive to the site with virgin excavated natural materials (VENM), excavated natural materials (ENM) and C&D materials from sites, entering the property from Sargents Road.
- Trucks arrive on site at a rate of 4-5 per day (4-5 truck movements entering the site and 4-5 truck movements exiting the site).
- Trucks drive into the unloading and processing shed and unload materials in the holding area.
- Materials are crushed, screened and separated.
- Sorted materials are loaded to stockpiles using the front end loader. Sorted materials are stored in designated bays include bricks, concrete, timber, glass and metal.
- The bunkers and stockpiles are external to the shed.
- Products are either exported from site by truck, sold on location, or stored on site.



3. NEAREST SENSITIVE RECEPTORS

Table 3-1 identifies the nearest sensitive receptors that have the potential to be affected by the proposal. The aerial photographs of the sensitive receivers are shown in Figure 3-1. These receptors were selected based on their proximity and directional bearing from the subject site.

Table 3-1: Nearest Receivers

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Type of Receptor
R1	103 Stannix Park Lane, Wilberforce	Lot 111 DP 1171265	1230 m N	Residential
R2	82 Stannix Park Lane, Wilberforce	Lot 112 DP 1171265	930 m NW	Residential
R3	60 Stannix Park Lane, Wilberforce	Lot 2153 DP 1073493	890 m NW	Residential
R4	235 Stannix Park Road, Wilberforce	Lot 2 DP 48682	1240 m W	Residential
R5	283 Stannix Park Road, Wilberforce	Lot 1 DP 847274	1040 m W	Residential
R6	71 Sargents Road, Ebenezer	Lot 91 DP 1049276	390 m SW	Residential
R7	79 Sargents Road, Ebenezer	Lot 92 DP 1049276	Adjacent SW	Residential
R8	56 Sargents Road, Ebenezer	Lot 100 DP 1044703	520 m S	Residential
R9	89 Kolora Road, Ebenezer	Lot 4 DP 253783	650 m SE	Residential
R10	65 Kolora Road, Ebenezer	Lot 3 DP 253783	480 m SE	Residential
R11	88 Kolora Road, Ebenezer	Lot 2 DP 557365	350 m SE	Residential
R12	96 Kolora Road, Ebenezer	Lot 1 DP 557365	390 m NE	Residential



Figure 3-1: Nearby Receptors





4. EXISTING ACOUSTIC ENVIRONMENT

The level of background and ambient noise is assessed separately for the daytime, evening and night time assessment periods. The NSW EPA Noise Policy for Industry defines these periods as follows:

- **Day** is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays;
- **Evening** is defined as 6.00pm to 10.00pm, Monday to Sunday and Public Holidays; and
- **Night** is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

An attended noise measurement was conducted on the 18th of October at one (1) residential location.

4.1 NOISE MONITORING EQUIPMENT AND METHODOLOGY

The attended noise level measurement was carried out using a Svantek SVAN 957 Precision Sound Level Meter. The instrument set complied with AS IEC 61672.1–2004 and was calibrated by a NATA accredited laboratory within two years of the measurement period. Calibration certificates have been included in Attachment 2.

Measurements of ambient noise levels were carried out in accordance with the Australian Standard AS 1055–1997 *Acoustics – Description and measurements of environmental noise* – Part 1 and Part 2 and the Noise Policy for Industry (EPA, 2017).

To ensure accuracy and reliability in the results, field reference checks were applied both before and after the measurement period with an acoustic calibrator. There were no excessive variances observed in the reference signal between the pre-measurement and post-measurement calibration. The instrument was set on A-weighted Fast response and noise levels were measured over a 15-minute statistical interval. QA/QC procedures applied for the measurement and analysis of noise levels have been presented in Attachment 3. The microphone was fitted with a windsock and was positioned between 1.2 and 1.5 metres above ground level.

Details of the instrumentation and setting utilised are provided in Table 4-1.

Table 4-1: Instrumentation and Setup Details

Type of Monitoring	Equipment	Serial Number	Setup Details
Short-term Attended	Svantek SVAN957 Type 1 Integrating Sound and Vibration analyser	15335	Three channels: A-weighted Fast Response C-weighted Fast Response A-weighted Impulse Response 15 minute integration period 1/3 octave band recorded every 100 ms Logger file Recorded at steps of 100 ms



4.2 MEASUREMENT LOCATIONS

An attended noise measurement was undertaken on the 18th October 2018 at one (1) residential location. The measurement location is shown in Figure 3-1 and listed in Table 4-2.

Table 4-2: Noise Monitoring Locations

Monitoring Location	Methodology	Address
A	Attended monitoring	99 Sargents Road, Ebenezer

4.3 MEASURED NOISE LEVELS

4.3.1 Short Term Operator Attended Noise Monitoring Results

Attended noise monitoring was conducted on Thursday the 18th of October 2018 in order to gain an understanding of the background noise sources of the area. Noise contributions were obtained from ambient noise sources such as local fauna, road traffic and industrial sources. The results of the short-term attended noise monitoring are displayed in Table 4-3.

The attended measurements showed that the background noise levels were dominated by constant bird chirping from surrounding bushland. Ambient noise levels consisted of dogs, aeroplanes, road traffic from nearby roads and residential noise from neighbouring sites. The background noise level was measured to be 34 dB(A).

Table 4-3: Operator Attended Noise Measurements, dB(A)

Location & Date/Time	L _{Aeq}	L _{A90}	L _{A10}	L _{A1}	Comments
Location A Thursday 18/10/2018 9:32 Daytime Period	49	34	48	59	Car Sargents Road < 65 dB(A) Truck Air Brakes Sackville Ferry Road < 43 dB(A) Birds Chirping < 57 dB(A) Aeroplane < 48 dB(A) Dog < 48 dB(A) Trucks Stannix Park Road < 41 dB(A)

4.3.2 Long-Term Unattended Noise Monitoring Results

Based upon the site visit and the L_{A90} from the attended noise measurement, it was decided that any long term measurements on site would fall below the minimum rating background level (RBL) as per Table 2.1 of the Noise Policy for Industry. The minimum RBL is shown in Table 4-4 below.



Table 4-4: Unattended Noise Monitoring Results, dB(A)

Monitoring Location and associated receptors	Assessment Background Level ABL (L ₉₀)		
	Day	Evening	Night
Logger A	35 ¹	30 ¹	30 ¹

Note 1: As per Table 2.1 of the Noise Policy for Industry, the minimum assumed background noise levels are 35 dB(A) for the day period, 30 dB(A) for the evening period and 30 dB(A) for the night period.



5. METEOROLOGICAL CONDITIONS

Wind and temperature inversions may affect the noise impact at the receptors. Therefore noise enhancing weather conditions should be assessed when wind and temperature inversions are considered to be a feature of the area.

A site-representative meteorological data file was obtained from the Bureau of Meteorology (BOM) for the Richmond RAAF Automatic Weather Station (AWS ID 067105). At the time of preparing this report, the last full year of data available is 2017, and was therefore considered appropriate.

5.1 WIND EFFECTS

Wind is considered to be a feature where source-to-receiver wind speeds (at 10 m height) of 3 m/s or below occur for 30% or more of the time in any assessment period in any season.

5.1.1 Wind Rose Plots

Wind rose plots show the direction that the wind is coming from, with triangles known as “petals”. The petals of the plots in the figures summarise wind direction data into 8 compass directions i.e. north, north-east, east, south-east, etc. The length of the triangles, or “petals”, indicates the frequency that the wind blows from that direction. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes.

Thus, the segments of a petal show what proportion of wind for a given direction falls into each class. The proportion of time for which wind speed is less than 0.5 m/s, when speed is negligible, is referred to as calm hours or “calms”. Calms are not shown on a wind rose as they have no direction, but the proportion of time consisting of the period under consideration is noted under each wind rose.

The concentric circles in each wind rose are the axis, which denote frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are similar in size. The frequencies denoted on the axes are indicated beneath each wind rose.

5.1.2 Local Wind Trends

Seasonal wind rose plots for this site utilising Richmond RAAF AWS data have been included in Figure 5-1, Figure 5-2 and Figure 5-3 for day, evening and night periods respectively.



Figure 5-1: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Day time

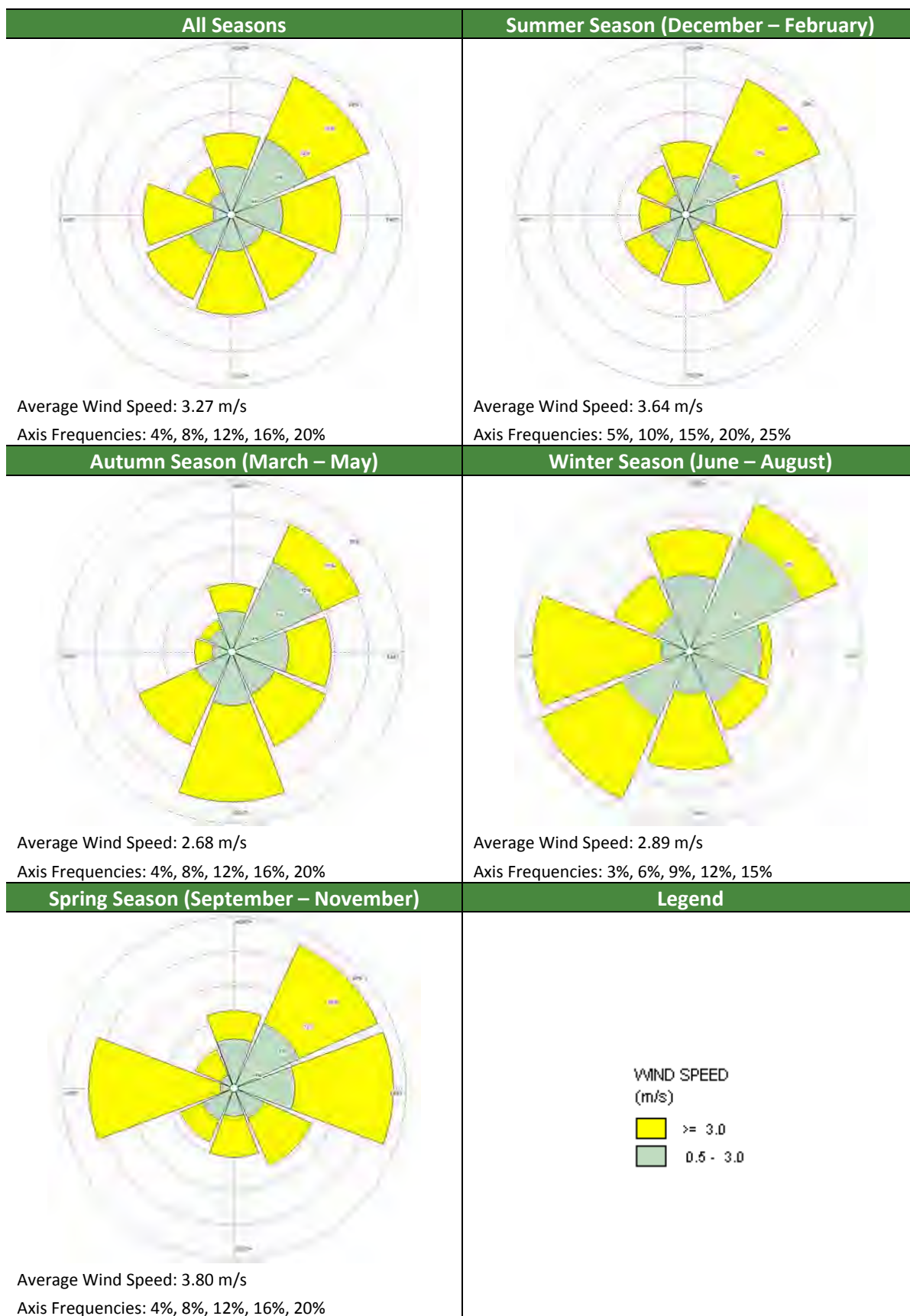




Figure 5-2: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Evening time

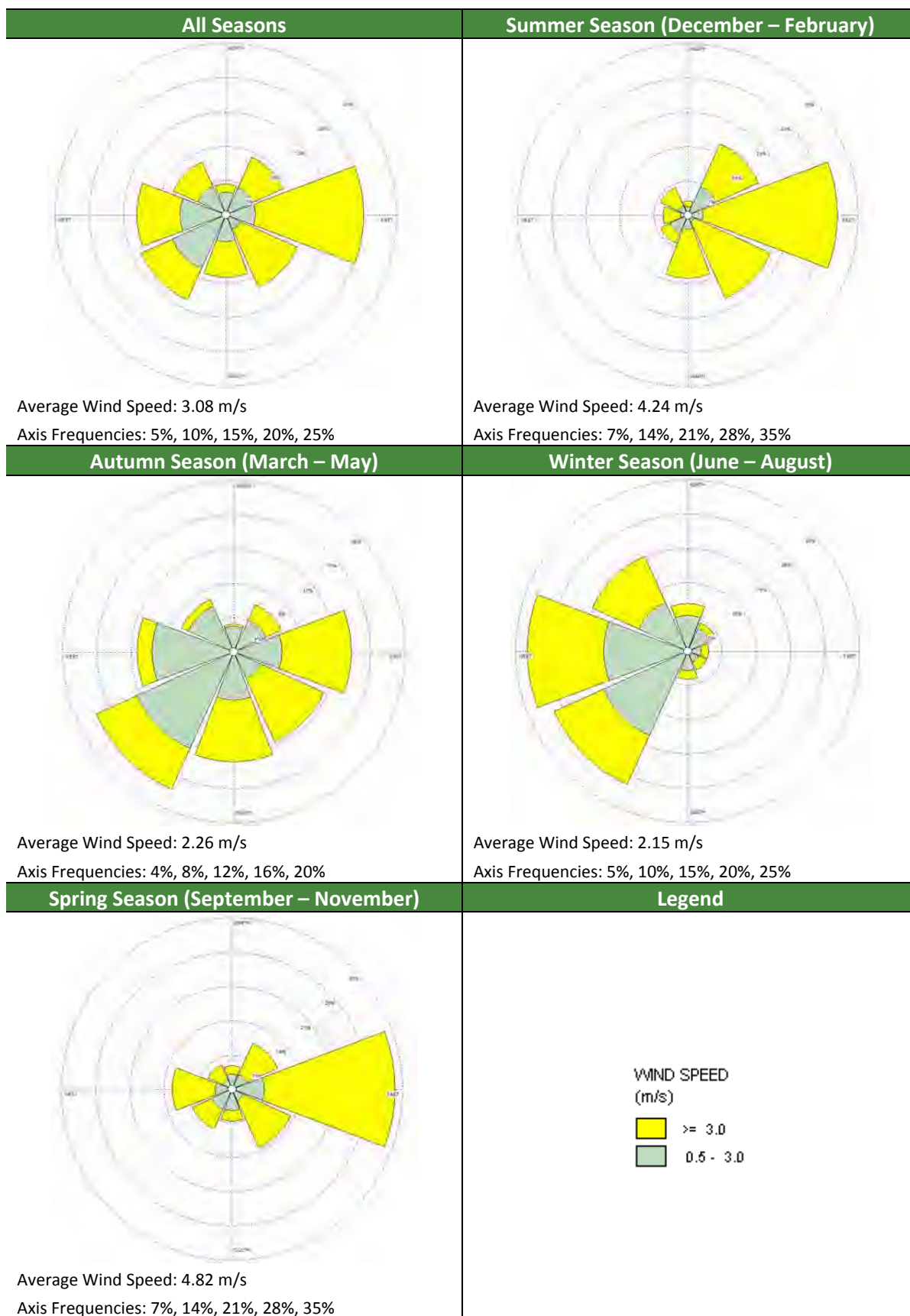
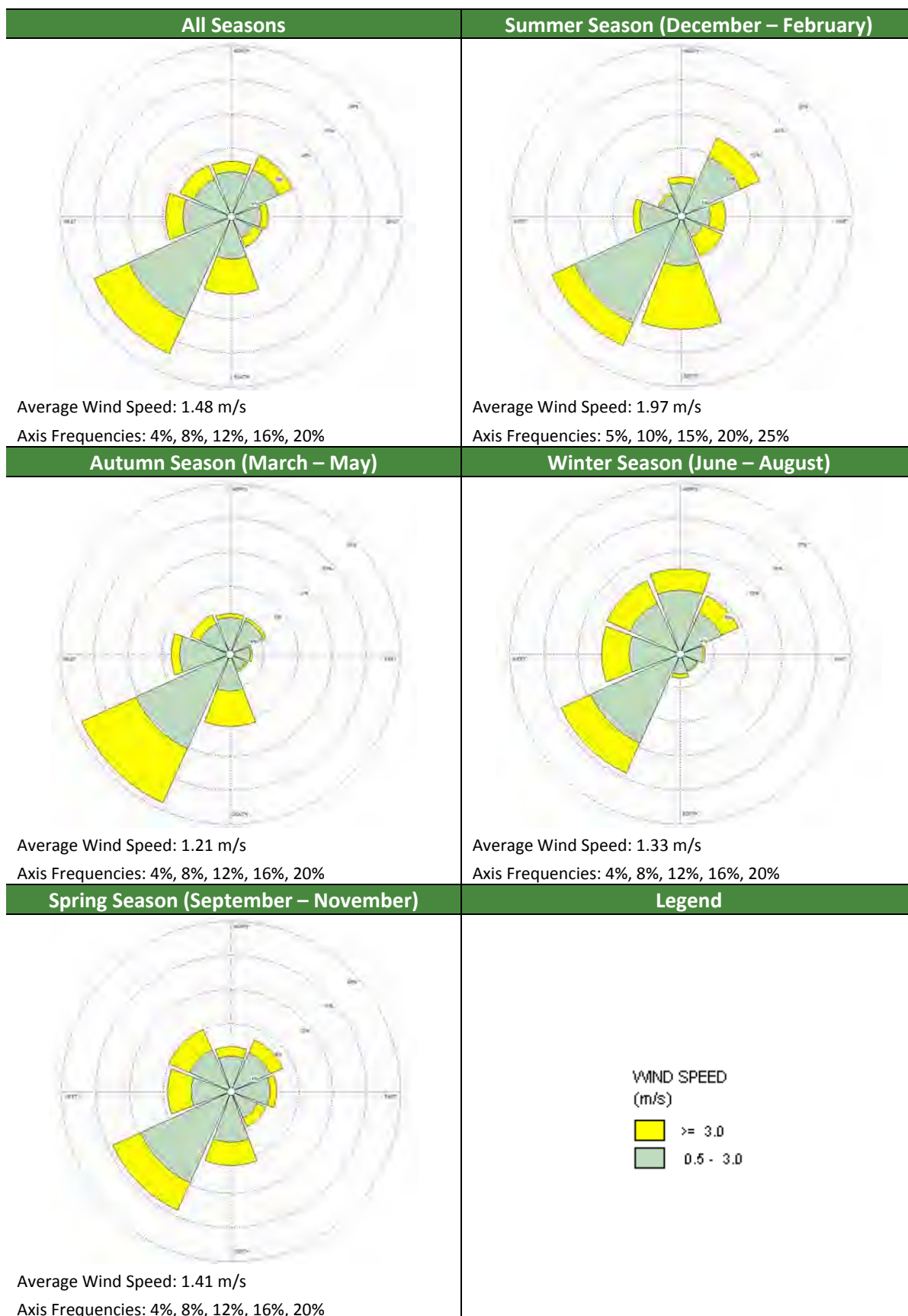




Figure 5-3: Wind Rose Plots – BOM Richmond RAAF AWS ID 067105 2017 – Night time





Based on the information presented from the weather data, source-to receiver wind speeds of 3 m/s or below are not present for more than 30% of the time during any season or time period. Therefore wind effects have not been included in the assessment.

5.2 TEMPERATURE INVERSIONS

Temperature inversion is considered a feature where this occurs more than 30% of the nights in winter.

As stated in section 2.2, the site is seeking approval to operate from Monday to Friday 7am to 6pm and Saturday from 8am to 4pm. As the site will not operate during the night period, temperature inversions have not been considered in noise impact assessment.

5.2.1 Weather Conditions Considered in the Assessment

The following conditions will be considered in this noise impact assessment:

- Condition A: Neutral Weather Conditions.

Details of the considered meteorological conditions have been displayed in Table 5-1.

Table 5-1: Meteorological Conditions Assessed in Noise Propagation Modelling

Condition	Classification	Ambient Temp.	Ambient Humidity	Wind Speed	Wind Direction (blowing from)	Temperature Inversion	Affected Receiver	Applicability
A	Neutral	10 °C	70%	-	-	No	All	All periods



6. CURRENT LEGISLATION AND GUIDELINES

6.1 NSW EPA NOISE POLICY FOR INDUSTRY

The NSW Noise Policy for Industry was developed by the NSW EPA primarily for the assessment of noise emissions from industrial sites regulated by the NSW EPA.

The policy sets out two components that are used to assess potential site-related noise impacts. The intrusiveness noise level aims at controlling intrusive noise impacts in the short-term for residences. The amenity noise level aims at maintaining a suitable amenity for particular land uses including residences in the long-term. The more stringent of the intrusiveness or amenity level becomes the project noise trigger levels for the project.

6.1.1 Project Intrusiveness Noise Level

The project intrusiveness noise level is determined as follows:

$$L_{Aeq, 15 \text{ minute}} = \text{rating background noise level} + 5 \text{ dB}$$

Where the $L_{Aeq, (15 \text{ minute})}$ is the predicted or measured L_{Aeq} from noise generated within the project site over a fifteen minute interval at the receptor.

This is to be assessed at the most affected point on or within the residential property boundary or if that is more than 30 m from the residence, at the most affected point within 30 m of the residential dwelling.

6.1.2 Amenity Noise Level

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.2 of the NSW Noise Policy for Industry 2017. The relevant recommended noise levels applicable are reproduced in Table 6-1.

Table 6-1: Amenity noise levels.

Receiver	Noise Amenity Area	Time of Day	L_{Aeq} dB(A)
			Recommended amenity noise level
Residential	Rural	Day	50
		Evening	45
		Night	40

Source: Table 2.2 NSW Noise Policy for Industry



The project amenity noise level for industrial developments = recommended amenity noise level minus 5 dB(A)

The following exceptions to the above method to derive the project amenity noise levels apply:

- 1. In areas with high traffic noise levels*
- 2. In proposed developments in major industrial clusters*
- 3. Where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.*
- 4. Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future. In such cases the relevant amenity noise level is assigned as the project amenity noise level for development.*

This development is not considered to be captured by the above exceptions.

6.1.3 Sleep Disturbance Criteria

In accordance with the NSW EPA Noise Policy for Industry, the potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

Where the subject development/premises night-time noise levels at a residential location exceed:

- **$L_{Aeq, 15 \text{ minute}}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or**
- **L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,**

A detailed maximum noise level assessment should be undertaken.

However, as the development is not proposed to operate during the night period, and therefore a sleep disturbance assessment is not considered warranted.

6.1.4 Project Noise Trigger Levels

The project noise trigger levels for the site have been established in accordance with the principles and methodologies of the NSW Noise Policy for Industry (EPA, 2017).

Table 6-2 below presents the rating background level, project intrusive noise level, recommended amenity noise level, and project amenity noise level. The project noise trigger level is the lowest value of intrusiveness or project amenity noise level after conversion to $L_{Aeq, 15 \text{ minute}}$, dB(A) equivalent level.

Different time periods apply for the noise criteria as the intrusive criterion considers a 15 minute assessment period while the amenity criterion requires assessment over the total length of time that a site is operational within each day, evening or night period. In order to ensure compliance under all circumstances, a 15 minute period assessment has been considered for all receptors.



Table 6-2: Project Noise Trigger Levels (PNTL) for Operational Activities, dB(A)

Receiver	Type of Receptor	Time of day	Rating background noise level	Project intrusiveness noise level ($L_{eq(15\text{ minute})}$)	Recommended amenity noise level $L_{Aeq\text{ period}}$	Project amenity noise level $L_{Aeq\text{ 15 minute}}^2$	PNTL $L_{Aeq\text{ 15 minute}}$
R1-R12	Residential - Rural	Day	35 ¹	40	50	48	40
		Evening	30 ¹	35	45	43	35
		Night	30 ¹	35	40	38	35

Notes:

1) These value are based on the minimum assumed rating background levels as outlined in Table 2.1 of the Noise Policy for Industry.

2) These levels have been converted to $L_{Aeq\text{ 15 minute}}$ using the following: $L_{Aeq\text{ 15 minute}} = L_{Aeq\text{ period}} + 3\text{ dB}$ (NSW Noise Policy for Industry Section 2.2).

6.2 NSW EPA ROAD NOISE POLICY

The NSW Road Noise Policy (RNP) has been adopted to establish the noise criteria for the potential noise impact associated with additional traffic generated by the proposal. The RNP was developed by the NSW EPA primarily to identify the strategies that address the issue of road traffic noise from:

- Existing roads;
- New road projects;
- Road redevelopment projects; and
- New traffic-generating developments.

6.2.1 Vehicle Route

Vehicles are proposed to access the site from Sargents Road. The potentially most impacted residents to the proposed route are located along Sargents Road between the subject site and Stannix Park Road.

6.2.2 Road Category

Based on the RNP road classification description, Sargents Road would be classified as a 'local roads'.

6.2.3 Noise Assessment Criteria

Section 2.3 of the RNP outlines the criteria for assessing road traffic noise. The relevant section of Table 3 of the RNP is shown in Table 6-3.



Table 6-3: Road Traffic Noise Assessment Criteria For Residential Land Uses, dB(A)

Road Category	Type of Project/Land Use	Assessment Criteria, dB(A)	
		Day (7am-10pm)	Night (10pm-7am)
Local roads	6. Existing residences affected by additional traffic on existing local roads generated by land use developments	L_{Aeq} (1 hour) 55 dB (external)	L_{Aeq} (1 hour) 50 dB (external)

* measured at 1 m from a building façade.

6.2.4 Relative Increase Criteria

In addition to the assessment criteria outlined above, any increase in the total traffic noise level at a location due to a proposed project or traffic-generating development must be considered. Residences experiencing increases in total traffic noise levels above the relevant criteria should also be considered for mitigation as described in Section 3.4 of the RNP. For road projects where the main subject road is a local road, the relative increase criterion does not apply.

As Sargents Road is classified as a local road, the relative increase criterion will not be further considered.

6.2.5 Assessment Locations for Existing Land Uses

Table 6-4: Assessment Locations for Existing Land Uses

Assessment Type	Assessment Location
External noise levels at residences	The noise level should be assessed at 1 metre from the façade and at a height of 1.5 metres from the floor. Separate noise criteria should be set and assessment carried out for each façade of a residence, except in straightforward situations where the residential façade most affected by road traffic noise can be readily identified. The residential noise level criterion includes an allowance for noise reflected from the façade ('façade correction'). Therefore, when taking a measurement in the free field where reflection during measurement is unlikely (as, for instance, when measuring open land before a residence is built), an appropriate correction – generally 2.5 dB – should be added to the measured value. The 'façade correction' should not be added to measurements taken 1 metre from the façade of an existing building. Free measurements should be taken at least 15 metres from any wall, building or other reflecting pavement surface on the opposite side of the roadway, and at least 3.5 metres from any wall, building or other pavement surface, behind or at the sides of the measurement point which would reflect the sound.



Table 6-4: Assessment Locations for Existing Land Uses

Assessment Type	Assessment Location
Noise levels at multi-level residential buildings	The external points of reference for measurement are the two floors of the building that are most exposed to traffic noise. On other floors, the internal noise level should be at least 10 dB less than the relevant external noise level on the basis of openable windows being opened sufficiently to provide adequate ventilation. (Refer to the Building Code of Australia (Australian Building Codes Board 2010) for additional information.)
Internal noise levels	Internal noise levels refer to the noise level at the centre of the habitable room that is most exposed to the traffic noise with openable windows being opened sufficiently to provide adequate ventilation. (Refer to the Building Code of Australia (Australian Building Codes Board 2010) for additional information.)
Open space – passive or active use	The noise level is to be assessed at the time(s) and location(s) regularly attended by people using the space. In this regard, 'regular' attendance at a location means at least once a week.

6.2.6 Road Traffic Project Specific Noise Levels

The selected project specific noise levels associated with road traffic noise are presented in Table 6-5.

Table 6-5: Project Specific Noise Levels Associated with Road Traffic, dB(A)

Receptor along	Period	Assessment Criteria L_{eq}
37 Sargents Road (Local Road)	Day	55
	Night	50

6.3 CONSTRUCTION NOISE AND VIBRATION CRITERIA

Criteria for construction and demolition noise has been obtained from the NSW Interim Construction Noise Guideline (DECC, 2009). Guidance for construction vibration has been taken from British Standard BS7385-Part 2: 1993 '*Evaluation and measurement for vibration in buildings*' and other standards.

6.3.1 NSW Interim Construction Noise Guideline

Residential Criteria

Table 2 of the Interim Construction Noise Guideline (DECC, 2009), sets out construction noise management levels for noise at residences and how they are to be applied. The management noise levels are reproduced in Table 6-6 below. Restrictions to the hours of construction may



apply to activities that generate noise at residences above the 'highly noise affected' noise management level.

Table 6-6: Management Levels at Residences Using Quantitative Assessment

Time of Day	Management Level $L_{Aeq(15 \text{ minute})}$	How to Apply
Recommended standard hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays	Noise Affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. - Where the predicted or measured $L_{Aeq(15 \text{ minute})}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. - The proponent should also inform all potentially affected residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. - Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before and after school, or mid-morning or mid-afternoon for works near residents). - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise Affected RBL + 5 dB	- A strong justification would typically be required for works outside the recommended standard hours. - The proponent should apply all feasible and reasonable work practices to meet the noise affected level. - Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. - For guidance on negotiating agreements see section 7.2.2 (RNP)



Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m from the residence.

Other Land Uses

The considered receivers in this report are all residential receivers. There are no other sensitive land uses in the area surrounding the proposed resource recovery facility.

Noise Criterion

The noise criterion for construction noise is presented in Table 6-7.

Table 6-7: Construction Noise Criterion dB(A)

Receiver	Land Use	Period	RBL L _{A90}	Management Level L _{Aeq(15 minute)}
R1-R12	Residential	Standard Hours	35	45

6.3.2 Vibration Criteria

Vibration criteria from construction works are outlined in this section, including guidelines to avoid cosmetic damage, structural damage or human discomfort. There is no specific vibration standard in NSW to assess cosmetic or structural damage to buildings. Usually the British Standard BS 7385–Part 2: 1993 ‘*Evaluation and measurement for vibration in buildings*’ or the German standard DIN4150–Part 3: 1999 ‘*Structural Vibration Part 3 – effects of vibration on structures*’ is referenced. The *Assessing Vibration – A Technical Guideline* (DEC, 2006) provides guidance on preferred levels for human exposure.

6.3.3 BS 7385-2:1993

The British Standard BS 7385–Part 2:1993 ‘*Evaluation and measurement for vibration in buildings*’ provides vibration limits to avoid cosmetic damage on surrounding structures. Limits are set at the lowest limits where cosmetic damage has previously been shown.

Table 6-8: Vibration criteria for cosmetic damage (BS 7385:2 1993)

Type of building	Peak component particle velocity in frequency range of predominant pulse		
	4 Hz to 15 Hz	15 Hz to 40 Hz	40 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above		
Unreinforced or light framed structures. Residential or light commercial type buildings	15 to 20 mm/s	20 to 50 mm/s	50 mm/s



6.3.4 DIN4150-3:1999

The German standard DIN4150-Part 3:1999 'Structural Vibration Part 3 – effects of vibration on structures' has also been considered. The German standard is considered more onerous than the British standard, and specifically includes more stringent limits to avoid structural damage to surrounding heritage buildings.

Table 6-9: Structural damage criteria heritage structures (DIN4150-3 1999)

Type of building	Peak component particle velocity (PPV) mm/s			
	Vibration at the foundation at a frequency of:			Vibration of horizontal plane of highest floor at all frequencies
	1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	
Buildings used for commercial purposes, industrial buildings or buildings of similar design	20	20 to 40	40 to 50	40
Residential dwellings and similar	5	5 to 15	15 to 20	15
Structures that, because of their particular sensitivity to vibration, cannot be classified as the two categories above, and are of intrinsic value (for example heritage listed buildings).	3	3 to 8	8 to 10	8

6.3.5 Human Exposure

The guideline *Assessing Vibration – A Technical Guideline* (DEC, 2006) describes preferred criteria for human exposure. The limits describe values where occupants of buildings would be impacted by construction work.

Table 6-10: Preferred and maximum weighted rms z-axis values, 1-80 Hz

Location	Daytime		Night time	
	Preferred	Maximum	Preferred	Maximum
Continuous Vibration (weighted root mean square (rms) vibration levels for continuous acceleration (m/s^2) in the vertical direction)				
Residences	0.01	0.02	0.007	0.014
Offices, schools, educational institutions and places of worship	0.02	0.04	0.02	0.04
Workshops	0.04	0.08	0.04	0.08
Impulsive Vibration (weighted root mean square (rms) vibration levels for impulsive acceleration (m/s^2) in the vertical direction)				



Table 6-10: Preferred and maximum weighted rms z-axis values, 1-80 Hz

Location	Daytime		Night time	
	Preferred	Maximum	Preferred	Maximum
Residences	0.3	0.6	0.1	0.2
Offices, schools, educational institutions and places of worship	0.64	1.28	0.64	1.28
Workshops	0.64	1.28	0.64	1.28
Intermittent Vibration (m/s)				
Residences	0.2	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.4	0.8	0.4	0.8
Workshops	0.8	1.6	0.8	1.6



7. OPERATIONAL NOISE IMPACT ASSESSMENT

7.1 MODELLING METHODOLOGY

7.1.1 Noise Model

Noise propagation modelling was carried out using the ISO 9613-2:1996 algorithm within SoundPLAN. This model has been extensively utilised by Benbow Environmental for assessing noise emissions for existing and proposed developments, and is recognised by regulatory authorities throughout Australia. The model allows for the prediction of noise from a site at the specified receptor, by calculating the contribution of each noise source. Other model inputs included the noise sources, topographical features of the subject area, ground absorption and receiver locations.

The modelling scenarios have been carried out using the $L_{Aeq, 15 \text{ minutes}}$ descriptor. Using the descriptor, noise emission levels were predicted at the nearest potentially affected sensitive receptors to determine the noise impact against the relevant noise criteria in accordance with the NSW EPA Noise Policy for Industry.

7.1.2 Assumptions Made for Noise Modelling

It should be noted that the relevant assessment period for operational noise emissions has been considered to be 15 minutes. Therefore noise source durations detailed in the following assumptions should be considered per 15 minute period in view of potential noise impacts under worst-case scenarios. Each assessment-specific assumption has been detailed below:

- Off-site topographical information was obtained from Google Earth.
- On-site topography has been obtained from the site survey plans provided by the client.
- The unloading and processing shed has been modelled as an industrial building with internal point sources. The roof and walls of the industrial building have been considered to be constructed of 0.5 mm colorbond sheet steel ($R_w = 22 \text{ dB}$). The floor has been modelled as concrete.
- The roller shutter doors and pedestrian doors have been modelled in the open position for the entire 15 minute scenario.
- All receptors were modelled at 1.5 m above ground level.
- All ground areas have been modelled considering different ground factors ranging from 0 to 1 (Soft to Hard ground). The subject site and immediate surrounding rural area have been modelled with a ground absorption factor of 1.0 (soft).
- One (1) truck has been modelled entering the site as a worst case scenario over a 15 minute period. An on-site speed of 10 km/hr has been considered.



- Internal noise sources associated with the site activities (i.e. triple deck screen and concrete crusher) have been modelled as point sources and will be operational for 100% of the operational hours of the site.
- Outdoor noise sources (i.e. the truck manouvering, excavator and front end loader) have been modelled as point or line sources and will be operational for 100% of the 15 minute operational period.

An outline of the noise sources and operational noise modelling scenarios has been provided below.

7.1.3 Noise Sources

A-weighted octave band centre frequency sound power levels are presented in Table 7-1 below. The sound power levels for the relevant noise sources have been calculated from measurements of sound pressure levels undertaken by an acoustic engineer from Benbow Environmental at similar sites and sourced from Benbow Environmental's extensive noise source database.

Table 7-1: A-weighted Sound Power Levels Associated with Operational Activities, dB(A)

Noise Source	Overall	Third Octave Band Centre Frequency (Hz)									
		25	31	40	50	63	80	100	125	160	200
		250	315	400	500	630	800	1000	1250	1600	2000
		2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
Concrete Jaw Crusher Komatsu BR380JG-1 (running loaded)	108	25	30	43	45	48	58	56	60	63	72
		80	80	78	83	85	84	81	82	81	78
		77	75	70	71	66	59	52	46	44	35
Triple Deck Screen	104	29	28	47	49	51	52	56	56	60	63
		65	69	70	71	74	74	76	77	78	78
		78	80	76	72	70	67	61	57	51	44
25T Excavator	102	-	-	-	-	82	-	-	85	-	-
		91	-	-	97	-	-	96	-	-	95
		-	-	92	-	-	85	-	-	-	-
Front End Loader (<111 kW at 2000 rpm)	102	44	51	59	85	84	77	77	78	80	85
		89	85	85	88	88	90	93	94	93	92
		91	90	88	87	84	81	77	73	66	60
Truck Engine	103	44	48	57	65	70	73	78	78	80	82
		83	85	94	98	94	96	89	88	82	87
		85	84	82	83	83	82	78	-	-	-
Truck Exhaust	101	42	46	55	63	68	71	76	76	78	80
		81	83	92	96	92	94	87	86	80	85
		83	82	80	81	81	80	76	-	-	-

7.1.4 Noise Modelling Scenarios

One operational scenario was considered in the noise model. The noise generating scenario considered a situation where all noise sources on site were operating over the 15 minute assessment period simulating a worst case situation (Scenario 1). This scenario was remodelled



with the eastern most roller shutter (door 4) closed (Scenario 2). The equipment list is detailed in Table 7-2, with an equipment location diagram in Figure 7-1.

Table 7-2: Modelled Noise Scenarios for Proposed Operations

Scenario	Time of the day	Noise Sources for Worst 15-minute Period
Scenario 1	Monday – Friday 7am to 6pm	Indoor Noise Sources • Triple decker screen • Crusher
	Saturday 8am to 4pm	Outdoor Noise sources • Truck manouvering • Front end loader (50% inside / 50% outside) • Excavator (50% inside / 50% outside)
Scenario 2	Monday – Friday 7am to 6pm	Indoor Noise Sources • Triple decker screen • Crusher
	Saturday 8am to 4pm	Outdoor Noise sources • Truck manouvering • Front end loader (50% inside / 50% outside) • Excavator (50% inside / 50% outside) Noise Control: Roller Shutter Door 4 closed (eastern most door)



Figure 7-1: Noise Source Locations



7.2 OPERATIONAL PREDICTED NOISE LEVELS

Results of the predictive noise modelling of the operational activities are shown in Table 7-3.

During operations, noise levels are predicted to comply with the Noise Policy for Industry criteria at all receivers during all scenarios at all receivers except R11 where a residual noise level of 1 dB(A) is predicted for scenario 1. This can be brought into compliance as shown in the predicted results from scenario 2 by closing roller shutter door 4 (eastern most roller shutter door) when the crusher is operating.

It is therefore concluded that the proposed site activities will not have a detrimental impact on the neighbouring receivers, if the noise control measures in section 7.3 are carried out.



Table 7-3: Noise Modelling Results Associated with Operational Activities, L_{eq} , dB(A)

Receiver	Criteria: PNTL ($L_{eq,15 \text{ minute}}$ dB(A)) – Day	Predicted: Scenario 1 ($L_{eq,15 \text{ minutes}}$ dB(A))	Predicted: Scenario 2 ($L_{eq,15 \text{ minutes}}$ dB(A))
R1	40	20✓	20✓
R2	40	22✓	22✓
R3	40	22✓	22✓
R4	40	18✓	18✓
R5	40	19✓	19✓
R6	40	28✓	28✓
R7	40	31✓	31✓
R8	40	36✓	35✓
R9	40	35✓	34✓
R10	40	37✓	36✓
R11	40	41✗	40✓
R12	40	34✓	34✓

7.3 NOISE CONTROL MEASURES

In order to achieve the predicted compliance levels at the nearest receptors, the following control measures are recommended to be implemented.

- As per section 2.2, site activities are recommended to be limited to the day period.
- As per section 7.1.2, the crushing and screening activities are recommended to take place inside the unloading and processing shed.
- Eastern most roller shutter door (roller shutter door 4) is closed when the crusher is operating.
- It is recommended mobile equipment regularly used onsite such as the excavator and front end loader be fitted with reversing lights or a white noise reversing alarm.

It is also recommended the following additional management practices be implemented:

- Prohibition of extended periods of on-site revving/idling;
- Minimisation of the use of truck exhaust brakes on site;
- Enforcement of low on-site speed limits; and
- On-site vehicles to be maintained in accordance with a preventative maintenance program to ensure optimum performance and early detection of wearing or noisy components;



8. ROAD TRAFFIC NOISE IMPACT ASSESSMENT

A description of the calculation methodology and the noise predictions associated with road traffic has been provided below.

Calculation of road traffic noise contribution has been undertaken using SoundPLAN. It is understood that a maximum of 2 truck movements are proposed per hour during the day between 7am and 5pm. No truck movements are proposed during the night period. Vehicles are assumed to travel along Sargents Road at the posted speed of 60 km/h.

The $L_{Aeq, 1 \text{ hour}}$ noise descriptor has been calculated at the most affected residential receptor located along Sargents Road. The predicted noise levels are displayed in Table 8-1. The highest noise levels would be predicted at this location, therefore they are the only results displayed.

Table 8-1: Predicted Levels for Road Traffic Noise

Receptor	Noise Criteria		Site Contribution	
	Day $L_{Aeq, 1 \text{ hour}}$	Night $L_{Aeq, 1 \text{ hour}}$	Day $L_{Aeq, 1 \text{ hour}}$	Night $L_{Aeq, 1 \text{ hour}}$
37 Sargents Road, Ebenezer	55	50	45 ✓	N/A ✓

For the residential dwellings that front onto Sargents Road, the predicted noise levels associated with the vehicle movements from the site would be below the daytime criteria of $L_{Aeq (1 \text{ hour})}$ 55 dB for local roads.

Step 3 of Section 3.4.1 of the RNP identifies possible reasonable and feasible control measures when exceedances of either the outlined criteria. As no exceedances are predicted, the proposed vehicle movements comply with the RNP, and no additional mitigation strategies are recommended.



9. CONSTRUCTION NOISE IMPACT ASSESSMENT

9.1 CONSTRUCTION ACTIVITIES

Construction activities are proposed to include the following:

- Site establishment;
- The building of the unloading and processing shed; and
- The installation of a wash bay and weighbridge;

9.2 MODELLED NOISE GENERATING SCENARIOS

Considering the construction activities outlined in section 9.1, the three construction stages listed in Table 9-1 are modelled for civil works, concreting works and structure works. The noise generating stages consider a worst case scenario in which all equipment is running for 100% of the time over the 15 minute assessment period.

The equipment list for the stages is detailed in Table 9-1, with an equipment location diagrams in Figure 9-1 to Figure 9-3. Equipment is primarily located in the area of the proposed unloading and processing shed, as the majority of the construction works will take place at this location.

All works are proposed to be undertaken during standard construction hours, that is

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

Table 9-1: Modelled Noise Stages for Proposed Construction Works

Scenario	Time of the day	Noise Sources for Worst 15-minute Period
Stage 1. Civil Works	Standard hours	• Dozer • Backhoe • Truck • Hand tools
Stage 2. Concreting construction works	Standard hours	• Concrete mixer truck • Concrete pump • Hand tools
Stage 3. Structure construction works	Standard hours	• Truck • Crane • Hand Tools



Figure 9-1: Construction Stage 1 – Civil Works





Figure 9-2: Construction Stage 2 – Concreting Construction Works





Figure 9-3: Construction Stage 3 – Structure Construction Works



9.3 MODELLING METHODOLOGY

9.3.1 Noise Model

Noise propagation modelling for the construction activities was carried out using the ISO 9613 algorithm within SoundPLAN. The construction stages were modelled using the $L_{Aeq, 15 \text{ minutes}}$ descriptor.

Assumptions made in the noise modelling of the construction noise stages are as follows:

- The relevant assessment period for operational noise emissions has been considered to be 15 minutes. Construction stages assume all equipment is running 100% of the time during the 15 minute assessment period, to provide a worst case scenario;
- Topographical information for off-site areas was obtained from Google Earth;
- Topographical information for on-site areas was obtained from the site survey;
- All receptors were modelled at 1.5 m above ground level;



- The surrounding ground areas have been modelled with a ground absorption coefficient of 1.0 (soft); and
- All noise sources associated with the construction works have been modelled as point sources.

9.3.2 Noise Sources

A-weighted octave band centre frequency sound power levels are presented shown in Table 9-2 below. The sound power levels for the relevant noise sources have been calculated from measurements of sound pressure levels undertaken by an acoustic engineer from Benbow Environmental at similar sites and sourced from Benbow Environmental's noise source database, as well as taken from AS 2436-2010 and the UK Department for Environmental Food and Rural Affairs (DEFRA) database, *Update of noise database for prediction of noise on construction and open sites*.

Table 9-2: A-weighted Sound Power Levels Associated with Construction Activities, dB(A)

Noise Source	Overall	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Truck	102	73	81	86	101	92	90	85	85
Dozer	105	75	89	94	100	100	98	92	82
Backhoe	96	76	78	83	89	91	89	88	77
Hand tools	100	71	81	91	96	94	90	87	81
Concrete truck	108	85	86	85	94	98	107	89	82
Concrete pump truck	105	77	92	97	99	100	95	95	89
Crane	106	90	95	99	100	100	98	90	80

9.4 CONSTRUCTION PREDICTED NOISE LEVELS

Results of the predictive noise modelling of the construction activities are shown in Table 9-3. Compliance is predicted with the day noise criteria at all receptors and stages of construction.

Construction activities are therefore proposed to take place during standard **construction** hours only as follows:

Monday to Friday:	7am to 5pm (with no hammering or saw-cutting to occur before 7.30am)
Saturday:	8am to 1pm (with no hammering or saw-cutting to occur before 8.30am)
Sunday and Public Holidays:	No works permitted



Table 9-3: Noise Modelling Results Associated with Construction Activities for L_{eq} , dB(A)

Receiver	Criteria: PSNL ($L_{eq,15\text{ minute}}$ dB(A))	Predicted Levels: Stage (Standard Hours) (L_{eq} , dB(A))		
	Standard Hours	1	2	3
R1	45	24 ✓	25 ✓	25 ✓
R2	45	27 ✓	28 ✓	28 ✓
R3	45	28 ✓	29 ✓	29 ✓
R4	45	24 ✓	25 ✓	26 ✓
R5	45	24 ✓	24 ✓	26 ✓
R6	45	31 ✓	33 ✓	34 ✓
R7	45	39 ✓	40 ✓	41 ✓
R8	45	34 ✓	34 ✓	35 ✓
R9	45	32 ✓	33 ✓	33 ✓
R10	45	34 ✓	36 ✓	35 ✓
R11	45	40 ✓	42 ✓	40 ✓
R20	45	37 ✓	40 ✓	38 ✓

✓Complies ✗ Non-compliance



10. STATEMENT OF POTENTIAL NOISE IMPACT

A noise impact assessment was undertaken to assess the potential noise emissions from the proposed landscape material supplies and resource recovery development located at 99 Sargents Road, Ebenezer.

The noise impact assessment was undertaken in accordance with the following guidelines:

- NSW Environment Protection Authority Noise Policy for Industry 2017;
- Department of Environment, Climate Change and Water NSW Road Noise Policy 2011; and
- Department of Environment, Climate Change and Water NSW Interim Construction Noise Guideline 2009.

The nearest receivers and noise criteria were identified. The site operations were modelled using the predictive noise software, Sound Plan.

The activities proposed by the proponent were found to be within the framework of the NSW Noise Policy for Industry. The noise generating scenarios are predicted to comply with the project specific noise levels at all receivers. Recommendations for noise controls are given in section 7.3, including operational hours and site management practices.

Compliance with the guidelines set out in the NSW Road Noise Policy was predicted at all considered receptors.

Construction activities are recommended to be limited to standard hours in accordance with the Interim Construction Noise Guideline.

This concludes the report.



Emma Hansma
Senior Engineer

R T Benbow
Principal Consultant



11. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

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Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

Attachment 1: Noise Glossary

Glossary of Noise Terminology

'A' FREQUENCY WEIGHTING

The 'A' frequency weighting roughly approximates to the Fletcher-Munson 40 phon equal loudness contour. The human loudness perception at various frequencies and sound pressure levels is equated to the level of 40 dB at 1 kHz. The human ear is less sensitive to low frequency sound and very high frequency sound than midrange frequency sound (i.e. 500 Hz to 6 kHz). Humans are most sensitive to midrange frequency sounds, such as a child's scream. Sound level meters have inbuilt frequency weighting networks that very roughly approximates the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The 'A' weighting is the most commonly used frequency weighting for occupational and environmental noise assessments. However, for environmental noise assessments, adjustments for the character of the sound will often be required.

AMBIENT NOISE

The ambient noise level at a particular location is the overall environmental noise level caused by all noise sources in the area, both near and far, including all forms of traffic, industry, lawnmowers, wind in foliage, insects, animals, etc. Usually assessed as an energy average over a set time period 'T' ($L_{Aeq,T}$).

AUDIBLE

Audible refers to a sound that can be heard. There are a range of audibility grades, varying from "barely audible", "just audible" to "clearly audible" and "prominent".

BACKGROUND NOISE LEVEL

Total silence does not exist in the natural or built-environments, only varying degrees of noise. The Background Noise Level is the minimum repeatable level of noise measured in the absence of the noise under investigation and any other short-term noises such as those caused by all forms of traffic, industry, lawnmowers, wind in foliage, insects, animals, etc.. It is quantified by the noise level that is exceeded for 90 % of the measurement period 'T' ($L_{A90,T}$). Background Noise Levels are often determined for the day, evening and night time periods where relevant. This is done by statistically analysing the range of time period (typically 15 minute) measurements over multiple days (often 7 days). For a 15 minute measurement period the Background Noise Level is set at the quietest level that occurs at 1.5 minutes.

'C' FREQUENCY WEIGHTING

The 'C' frequency weighting approximates the 100 phon equal loudness contour. The human ear frequency response is more linear at high sound levels and the 100 phon equal loudness contour attempts to represent this at various frequencies at sound levels of approximately 100 dB.

DECIBEL

The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10^{(50/10)} + 10^{(50/10)})$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.

dBA – See ‘A’ frequency weighting

dBC – See ‘C’ frequency weighting

EQUIVALENT CONTINUOUS SOUND LEVEL, L_{Aeq}

Many sounds, such as road traffic noise or construction noise, vary repeatedly in level over a period of time. More sophisticated sound level meters have an integrating/averaging electronic device inbuilt, which will display the energy time-average (equivalent continuous sound level - L_{Aeq}) of the ‘A’ frequency weighted sound pressure level. Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.

‘F’ (FAST) TIME WEIGHTING

Sound level meter design-goal time constant which is 0.125 seconds.

FREE FIELD

In acoustics a free field is a measurement area not subject to significant reflection of acoustical energy. A free field measurement is typically not closer than 3.5 metres to any large flat object (other than the ground) such as a fence or wall or inside an anechoic chamber.

FREQUENCY

The number of oscillations or cycles of a wave motion per unit time, the SI unit is the hertz (Hz). 1 Hz is equivalent to one cycle per second. 1000 Hz is 1 kHz.

IMPULSE NOISE

An impulse noise is typified by a sudden rise time and a rapid sound decay, such as a hammer blow, rifle shot or balloon burst.

MAXIMUM NOISE LEVEL, L_{AFmax}

The root-mean-square (rms) maximum sound pressure level measured with sound level meter using the 'A' frequency weighting and the 'F' (Fast) time weighting. Often used for noise assessments other than aircraft.

NOISE

Noise is unwanted, harmful or inharmonious (discordant) sound. Sound is wave motion within matter, be it gaseous, liquid or solid. Noise usually includes vibration as well as sound.

NOISE REDUCTION COEFFICIENT – See: "Sound Absorption Coefficient"**OFFENSIVE NOISE**

Reference: Dictionary of the NSW Protection of the Environment Operations Act (1997).

"Offensive Noise means noise:

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or likely to be harmful to) a person who is outside the premise from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulations."

SOUND ABSORPTION COEFFICIENT, α

Sound is absorbed in porous materials by the viscous conversion of sound energy to a small amount of heat energy as the sound waves pass through it. Sound is similarly absorbed by the flexural bending of internally damped panels. The fraction of incident energy that is absorbed is termed the Sound Absorption Coefficient, α . An absorption coefficient of 0.9 indicates that 90 % of the incident sound energy is absorbed. The average α from 250 to 2 kHz is termed the Noise Reduction Coefficient (NRC).

SOUND ATTENUATION

A reduction of sound due to distance, enclosure or some other device. If an enclosure is placed around a machine, or an attenuator (muffler or silencer) is fitted to a duct, the noise emission is reduced or attenuated. An enclosure that attenuates the noise level by 20 dB reduces the sound energy by one hundred times.

SOUND PRESSURE

The rms sound pressure measured in pascals (Pa). A pascal is a unit equivalent to a newton per square metre (N/m^2).

SOUND PRESSURE LEVEL, L_p

The level of sound measured on a sound level meter and expressed in decibels (dB). Where $L_p = 10 \log_{10} (P_a/P_o)^2$ dB (or $20 \log_{10} (P_a/P_o)$ dB) where P_a is the rms sound pressure in Pascal and P_o is a reference sound pressure conventionally chosen is $20 \mu\text{Pa}$ (20×10^{-6} Pa) for airborne sound. L_p varies with distance from a noise source.

SOUND POWER

The rms sound power measured in watts (W). The watt is a unit defined as one joule per second. A measures the rate of energy flow, conversion or transfer.

SOUND POWER LEVEL, L_w

The sound power level of a noise source is the inherent noise of the device. Therefore sound power level does not vary with distance from the noise source or with a different acoustic environment. $L_w = L_p + 10 \log_{10} 'a'$ dB, re: 1pW, (10^{-12} watts) where 'a' is the measurement noise-emission area (m^2) in a free field.

STATISTICAL NOISE LEVELS, L_n .

Noise which varies in level over a specific period of time 'T' (standard measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors for example:-

- The noise level, in decibels, exceeded for 1 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as L_{AF1} , T. This may be used for describing short-term noise levels such as could cause sleep arousal during the night.
- The noise level, in decibels, exceeded for 10 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as L_{AF10} , T. In most countries the L_{AF10} , T is measured over periods of 15 minutes, and is used to describe the average maximum noise level.
- The noise level, in decibels, exceeded for 90 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as L_{AF90} , T. In most countries the L_{AF90} , T is measured over periods of 15 minutes, and is used to describe the average minimum or background noise level.

STEADY NOISE

Noise, which varies in level by 6 dB or less, over the period of interest with the time-weighting set to "Fast", is considered to be "steady". (Refer AS 1055.1—1997).

WEIGHTED SOUND REDUCTION INDEX, R_w

This is a single number rating of the airborne sound insulation of a wall, partition or ceiling. The sound reduction is normally measured over a frequency range of 100 Hz to 3.150 kHz and averaged in accordance with ISO standard weighting curves (Refer AS/NZS ISO 717-1:2004). Internal partition wall $R_w + C$ ratings are frequency weighted to simulate insulation from human voice noise. The $R_w + C$ is similar in value to the STC rating value. External walls, doors and windows may be $R_w + C_{tr}$ rated to simulate insulation from road traffic noise. The spectrum adaptation term C_{tr} adjustment factor takes account of low frequency noise. The weighted sound reduction index is normally similar or slightly lower number than the STC rating value.

'Z' FREQUENCY WEIGHTING

The 'Z' (Zero) frequency weighting is 0 dB within the nominal 1/3 octave band frequency range centred on 10 Hz to 20 kHz. This is within the tolerance limits given in AS IEC 61672.1—2004: *'Electroacoustics – Sound level meters – Specifications'*.

Attachment 2: Calibration Certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE No: 23100

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: Rion

Type No: NC-73

Serial No: 10186522

Owner:

Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

Tests Performed: Measured output pressure level was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 μ Pa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	94.16	990.12	3.88
Level 2:	NA	N	NA	NA	NA
Uncertainty:			± 0.11 dB	$\pm 0.05\%$	$\pm 0.20\%$

Uncertainty (at 95% c.i.) k=2

CONDITION OF TEST:

Ambient Pressure: 1010 hPa ± 1.5 hPa **Relative Humidity:** 31% $\pm 5\%$

Temperature: 24 $^{\circ}$ C $\pm 2^{\circ}$ C

Date of Calibration: 11/07/2018

Issue Date: 11/07/2018

Acu-Vib Test Procedure: AVP02 (Calibrators)

Test Method: AS IEC 60942 - 2004

CHECKED BY:  **AUTHORISED SIGNATURE:** 

Jack Riney

Accredited for compliance with ISO/IEC 17025 - Calibration

The results of the tests, calibration and/or measurements included in this document are traceable to Australian/National Standards.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.



Accredited Lab: 02602
Acoustic and Vibration
Measurements



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Mobile: 0413 409046
Web Site: www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 20815 & FILT 4015

Equipment Description: Sound & Vibration Analyser

Manufacturer: Svanetek

Model No: Svan-957 **Serial No:** 15335

Microphone Type: 7052E **Serial No:** 40814

Filter Type: 1/3 Octave **Serial No:** 15335

Comments: All tests passed for class 1.
(See over for details)

Owner: Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Ambient Pressure: 1014 hPa ± 1.5 hPa

Temperature: 23 °C $\pm 2^\circ$ C **Relative Humidity:** 53% $\pm 5\%$

Date of Calibration: 14/06/2017 **Issue Date:** 16/06/2017

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: *[Signature]* **AUTHORISED SIGNATURE:** *[Signature]*

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The results of the tests, calibration and/or measurements included in this document are traceable to
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Page 1 of 2
AVP00110 Rev. 1.2 03/02/15

Attachment 3: Noise QA/QC procedures

Calibration of Sound Level Meters

A sound level meter requires regular calibration to ensure its measurement performance remains within specification. Benbow Environmental sound level meters are calibrated by a National Association of Testing Authority (NATA) registered laboratory or a laboratory approved by the NSW Environment Protection Authority (EPA) every two years and after each major repair, in accordance with AS IEC 61672.1–2004 Electroacoustics – Sound level meters - Specifications.

The calibration of the sound level meter was checked immediately before and after each series of measurements using an acoustic calibrator. The acoustic calibrator provides a known sound pressure level, which the meter indicates when the calibrator is activated while positioned on the meter microphone.

The sound level meters also incorporate an internal calibrator for use in setting up. This provides a check of the electrical calibration of the meter, but does not check the performance of the microphone. Acoustical calibration checks the entire instrument including the microphone. Calibration certificates for the instrument sets used have been included as Attachment 2.

Care and Maintenance of Sound Level Meters

Noise measuring equipment contains delicate components and therefore must be handled accordingly. The equipment is manufactured to comply with international and national standards and is checked periodically for compliance. The technical specifications for sound level meters used in Australia are defined in Australian Standard AS IEC 61672.1–2004 Electroacoustics – Sound level meters - Specifications.

The sound level meters and associated accessories are protected during storage, measurement and transportation against dirt, corrosion, rapid changes of temperature, humidity, rain, wind, vibration, electric and magnetic fields. Microphone cables and adaptors are always connected and disconnected with the power turned off. Batteries are removed (with the instrument turned off) if the instrument is not to be used for some time.

Investigation Procedures

All investigative procedures were conducted in accordance with AS 1055.1—1997 *Acoustics – “Description and Measurement of Environmental Noise (Part 1: General Procedures)”*.

The following information was recorded and kept for reference purposes:

- type of instrumentation used and measurement procedure conducted;
- description of the time aspect of the measurements, ie. measurement time intervals; and
- positions of measurements and the time and date were noted.

As per AS 1055.1—1997, all measurements were carried out at least 3.5 m from any reflecting structure other than the ground. The preferred measurement height of 1.2 m above the ground was utilised. A sketch of the area was made identifying positions of measurement and the approximate location of the noise source and distances in meters (approx.).

UNATTENDED NOISE MONITORING

NOISE MONITORING EQUIPMENT

ARL noise logger type NGARA and EL-215 were used to conduct the long-term unattended noise monitoring. This equipment complies with Australian Standard AS IEC 61672.1–2004 *Electroacoustics – Sound level meters – Specifications* and are designated as a Type 2 instrument suitable for field use.

The measured data is processed statistically and stored in memory every 15 minutes. The equipment was calibrated prior and subsequent to the measurement period using a Rion NC-73 sound level calibrator. There were no significant variances observed in the reference signal between the pre-measurement and post-measurement calibrations. Instrument calibration certificates have also been included in Attachment 2.

METEOROLOGICAL CONSIDERATION DURING MONITORING

For the long-term attended monitoring, meteorological data for the relevant period were provided by the Bureau of Meteorology, which was considered representative of the site for throughout the monitoring period.

Measurements affected by wind or rain over certain limits were excluded from the final analyses of the recorded data in accordance with the EPA's Noise Policy for Industry. The wind data were modified to take into account the difference of height between the AWS (Automatic Weather Station) used by the Bureau of Meteorology (10 m above ground level), and the microphone (1.5 m above ground level). The correction factor applied to the data was calculated according to the Australian Standard AS 1170.2 2011 .

DESCRIPTORS & FILTERS USED FOR MONITORING

Noise levels are commonly measured using A-weighted filters and are usually described as dB(A). The "A-weighting" refers to standardised amplitude versus frequency curve used to "weight" sound measurements to represent the response of the human ear. The human ear is less sensitive to low frequency sound than it is to high frequency sound. Overall A-weighted measurements quantify sound with a single number to represent how people subjectively hear different frequencies at different levels.

Noise environments can be described using various descriptors depending on characteristics of noise or purpose of assessments. For this survey the L_{A90} , L_{Aeq} and L_{Amax} levels were used to analyse the monitoring results. The statistical descriptors L_{A90} measures the noise level exceeded for 90% of the sample measurement time, and is used to describe the "Background noise". Background noise is the underlying level of noise present in the ambient noise, excluding extraneous noise or the noise source under investigation. The L_{Aeq} level is the equivalent continuous noise level or the level averaged on an equal energy basis which is used to describe the "Ambient Noise". The L_{Amax} noise levels are maximum sound pressure levels measured over the sampling period and this parameter is commonly used when assessing noise impact.

Measurement sample periods were fifteen minutes. The Noise -vs- Time daily noise logger charts representing measured noise levels at the noise monitoring locations are presented in Attachment 4.

ATTENDED NOISE MONITORING

NOISE MONITORING EQUIPMENT

The attended short-term noise monitoring was carried out using a SVANTEK SVAN957 Class 1 Precision Sound Level Meters. The instrument was calibrated by a NATA accredited laboratory within two years of the measurement period. The instrument sets comply with AS IEC 61672.1-2004 and was set on A-weighted, fast response.

The microphone was positioned at 1.2 to 1.5 metres above ground level and was fitted with windsocks. The instrument was calibrated using a Rion NC-73 sound level calibrator prior and subsequent to the measurement period to ensure the reliability and accuracy of the instrument sets. There were no significant variances observed in the reference signal between the pre-measurement and post-measurement calibrations. Instrument calibration certificates have also been included in Attachment 2.

WEATHER CONDITIONS

It was clear, fine without significant breeze.

METHODOLOGY

The attended noise measurements were carried out generally in accordance with Australian Standard AS 1055—1997 - "*Acoustics – Description and Measurement of Environmental Noise*".

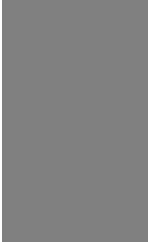
EIS Appendix 3: Phase I Assessment

**PHASE I ENVIRONMENTAL SITE ASSESSMENT
FOR
HALA CONSTRUCTIONS PTY LTD
99 SARGENTS ROAD, EBENEZER NSW 2756**

Prepared for: Hala Alameddine, Hala Constructions Pty Ltd

Prepared by: Damien Thomas, Graduate Environmental Scientist
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Report No: 181084_Phase_1_Rev3
August 2019
(Released: 2 August 2019)



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EXECUTIVE SUMMARY

Benbow Environmental was engaged by Hala Constructions Pty Ltd to prepare a Phase I Environmental Site Assessment (ESA) for an area, the subject site, situated within the property located at 99 Sargents Road, Ebenezer, New South Wales 2756.

The landholding, identified as Lot 288 DP751665, is of approximately 15 hectares in size, and is within the local government area of Hawkesbury City Council. The subject site itself is approximately 2 hectares.

As per the Hawkesbury City Council's *Local Environmental Plan 2012 Land Zoning Map*, the site is zoned as RU1 – Primary Production.

A review of all available relevant, current and historical documents has been carried out in order to gain a comprehensive understanding of the site's history.

A conceptual site model has been developed for the site indicating any potential sources of contamination, contaminants of concern, potentially impacted media and exposure pathways for human and environmental receptors.

A potential does exist for some minor soil contamination due to possible historical use of agricultural chemicals. However, the potential level of any such contamination is expected to be minimal and would not pose significant risk to human health or the environment.

Further investigation of the site such as a Phase II Assessment is considered unwarranted.



Damien Thomas
Graduate Environmental Scientist

R T Benbow
Principal Consultant

Contents	Page
EXECUTIVE SUMMARY	I
1. INTRODUCTION	1
1.1 Scope of Work	1
1.2 Relevant Legislation and Guidelines	1
1.3 Assessment of Issues	2
2. SITE IDENTIFICATION	3
3. REGIONAL AND LOCAL GEOLOGY, HYDROLOGY AND HYDROGEOLOGY	8
3.1 Soil Classification and Geology	8
3.2 Acid Sulfate Soils	8
3.3 Surface Hydrology and Local Hydrogeology	9
3.3.1 Groundwater Bore Search	10
4. SITE HISTORY	12
4.1 Title Search	12
4.2 Historical Title Search	12
4.3 Aerial Photographs	12
4.4 NSW EPA RECORDS	14
4.4.1 CLM Act 1997	14
4.4.2 POEO Register	14
4.5 Hawkesbury City Council	14
4.5.1 Past Consents	14
4.5.2 Section 10.7 (2) & (5) Certificate	14
4.5.3 Additional Site History Supplied By Council	15
5. SITE CONDITION AND SURROUNDING ENVIRONMENT	16
5.1 Local Topography	16
5.2 Site Walkover – Photographic Section	16
5.3 Potential Contamination Issues	24
5.3.1 Asbestos materials	24
5.3.2 Radioactive material	24
5.3.3 Lead Based Paints	24
5.3.4 Chemicals and Fuels Stored on Site	24
5.3.5 Air Emissions of Pollutants	25
5.3.6 Soil, Surface Water and/or Groundwater Pollution	25
5.3.7 Pesticide and Herbicide Usage and/or Contamination	25
5.3.8 Electromagnetic Fields	25
5.3.9 Wastewater Treatment System	25
5.3.10 Waste Disposal	25
6. CONCEPTUAL SITE MODEL	26
7. CONCLUSION AND RECOMMENDATION	27

8. LIMITATIONS	28
9. REFERENCES	29

Tables	Page
Table 2-1: Site Identification	3
Table 3-1: Available Data for Groundwater Bores Near the Subject Site	11
Table 4-1: Summary of Historical Aerial Photographs	13
Table 4-2: Summary of Council Development and Building Application / Consent Records	14
Table 6-1: Conceptual Site Model.	26

Figures	Page
Figure 2-1: Site Location Regional Setting	4
Figure 2-2: Site Location Local Setting	5
Figure 2-3: Hawkesbury City Council LEP 2012 – Land Zoning Map (extract)	6
Figure 2-4: Map of local area showing parent lot (in red) and proposal area (in green)	7
Figure 3-1: Acid Sulfate Soil Map	9
Figure 3-2: Nearest Waterbodies	10
Figure 5-1: Local Topography with Vertical Exaggeration of 10	16

Attachments

Attachment 1: Land Titles
Attachment 2: Historical Land Title
Attachment 3: Historical Aerial Photographs
Attachment 4: Section 10.7 (2) & (5) Certificate





1. INTRODUCTION

A Phase I Environmental Site Assessment has been undertaken for an area within the site located at 99 Sargents Road, Ebenezer NSW 2756.

This report has been prepared in accordance with *the Guidelines for Consultants Reporting on Contaminated Sites* (OEH August 2011).

The *NEPM Assessment of Site Contamination* (NEPC, 1999) amended 2013, was also referenced for the undertaking of the assessment as it constitutes the most updated tool for consultants in undertaking contaminated land assessments.

1.1 SCOPE OF WORK

The scope of this investigation extends to the following.

- Undertake a Phase I Preliminary Contamination Investigation;
- Undertake a site inspection to identify any potential areas impacted by contamination;
- Carry out the following:
 - ▶ Examine available site layouts;
 - ▶ Determine the potential pathways contaminants may take to reach the subsoil and groundwater;
 - ▶ Land Titles search;
 - ▶ Obtain and examine Council records; and
 - ▶ Examine historical aerial photographs of the site and surrounding area.
- Identify potential contamination and areas of potential contamination from an interpretation of the currently available information;
- Identify if a Phase II Environmental Site Assessment is warranted; and
- Provide recommendations in relation to additional investigations if any are considered necessary.

1.2 RELEVANT LEGISLATION AND GUIDELINES

The Phase I Environmental Site Assessment has been carried out in accordance with the following relevant NSW EPA or NSW EPA recognised guidelines:

- *Guidelines for Consultants Reporting on Contaminated Sites* (DECCW September 2000);
- *Guidelines for the NSW Site Auditor Scheme* (3rd Edition) (NSW EPA, October 2017);
- *Contaminated Land Management Act 1997*; and
- *NEPM Assessment of Site Contamination* (NEPC, 1999) amended 2013.



1.3 ASSESSMENT OF ISSUES

This Phase I provides an assessment of the following issues:

- Asbestos materials (onsite);
- Radioactive material;
- Lead based paints;
- Air emissions of pollutants;
- Surface water and/or groundwater pollution;
- Potential for soil contamination;
- Sensitive receptors;
- Pesticide and herbicide usage and/or contamination;
- Stormwater management;
- Electromagnetic fields;
- Potable water source;
- Historic land use; and
- Onsite waste.



2. SITE IDENTIFICATION

Site identification information and land use is summarised in the table below.

Table 2-1: Site Identification

Lot and DP Numbers (Address) ¹	Lot 288 DP751665 (99 Sargents Road, Ebenezer, 2756)
Coordinates ² MGA56	301848.318 Easting, 6288394.636 Northing
Approximate Site Area	2 ha within 15 ha lot
Local Government Area	Hawkesbury City Council
Current Land Zoning	RU1 – Primary Production
Current Site Owner	Hala Alameddine

Note: ¹ Source: <http://maps.six.nsw.gov.au/>,
² Centre of the site

The site location is presented as Figure 2-1 and an aerial photograph of the site displaying the lot boundary is shown in Figure 2-2.

The LEP drawing from Hawkesbury City Council shows the land use zoning of this area and is presented in Figure 2-3.

The focus of this Phase I report is a two-hectare area within the lot referred to throughout this report as “the subject site”. This area is shown in Figure 2-4.



Figure 2-1: Site Location Regional Setting



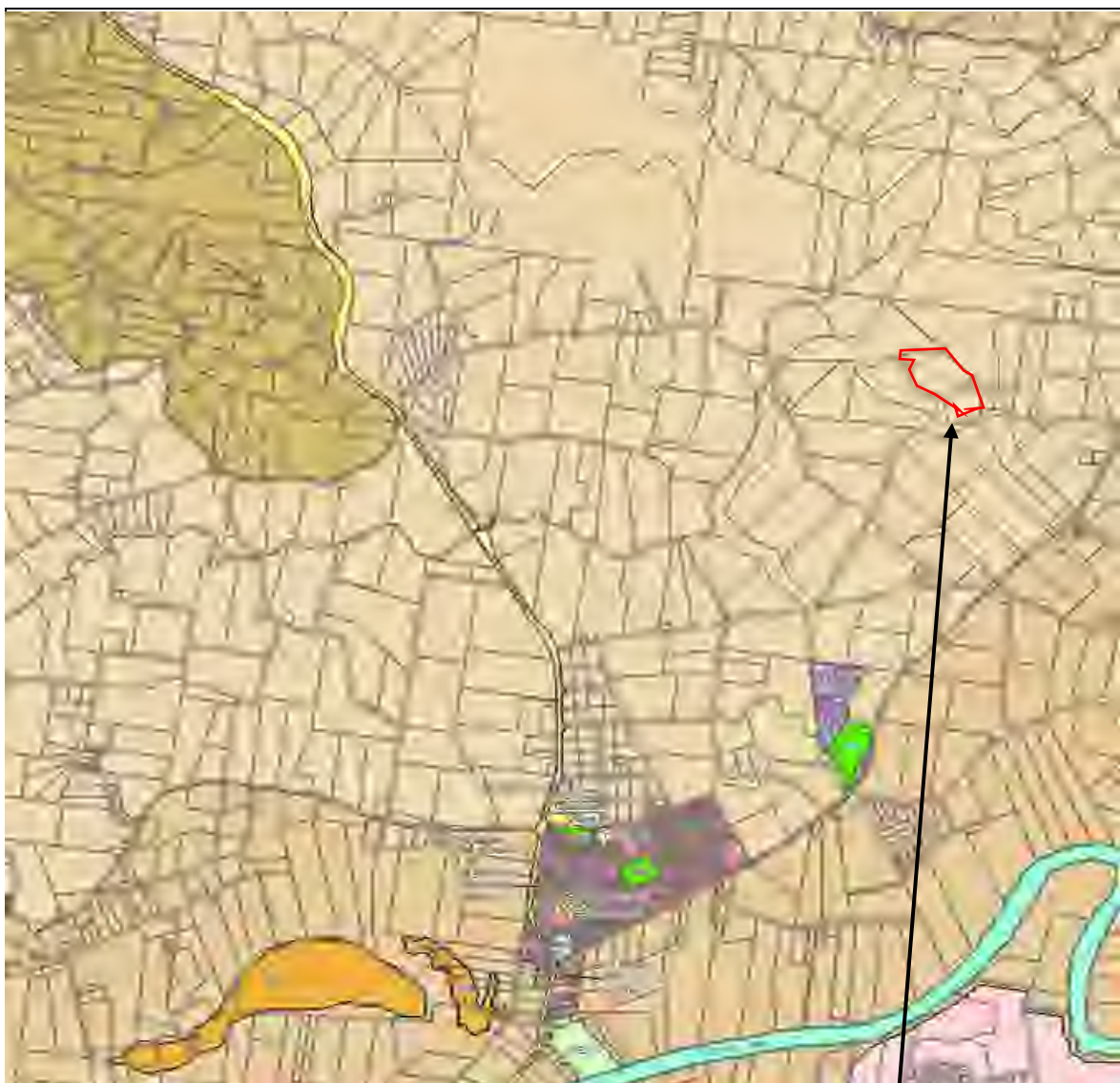


Figure 2-2: Site Location Local Setting





Figure 2-3: Hawkesbury City Council LEP 2012 – Land Zoning Map (extract)



Source: Hawkesbury City Council LEP 2012

Not to scale		Approximate site Location
	Site Boundary	Benbow Environmental 25-27 Sherwood Street Northmead NSW 2152

Source: Google Earth


 Parent lot
 Proposal site

 Benbow Environmental
 25-27 Sherwood Street
 Northmead NSW 2152



3. REGIONAL AND LOCAL GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

3.1 SOIL CLASSIFICATION AND GEOLOGY

The 'Penrith 1:100,000 Geological Map Sheet 9030' describes the geological composition of the area as follows:

'Qph: clay, clayey sand, silt.'

The soil map 'Soil Landscape of Penrith 1:100,000 Sheet 9030' shows that the subject site is located in an area classified as 'Woodlands', which is described as follows:

'Landscape – very broad benches and drainage lines in the passage beds of the Mittagong Formation (alternating bands of shale and fine-grained sandstones). Rock outcrop is minimal. Local relief up to 20 m. Slope <10%.

Soils – deep (150-300 cm) soils range from leached sands (Uc2.21) in the drainage lines to Lithosols (Uc1) on sideslopes, with Red Solodic Soils (Dr4.62), Xanthozems (Gn3.51) and Yellow Earths (Gn2.24) on benches.

Limitations – stony soil, low soil fertility, low available water holding capacity.'

Soils on slopes are Erosional.

3.2 ACID SULFATE SOILS

The parcel of land, described as Lot 288 DP751665, contains Class 3 and Class 5 land, as described in the Acid Sulfate Soil Map of the Hawkesbury LEP 2012 (see Figure 3-1). Work undertaken in these areas could present an environmental risk in their respective classes.

Class 3

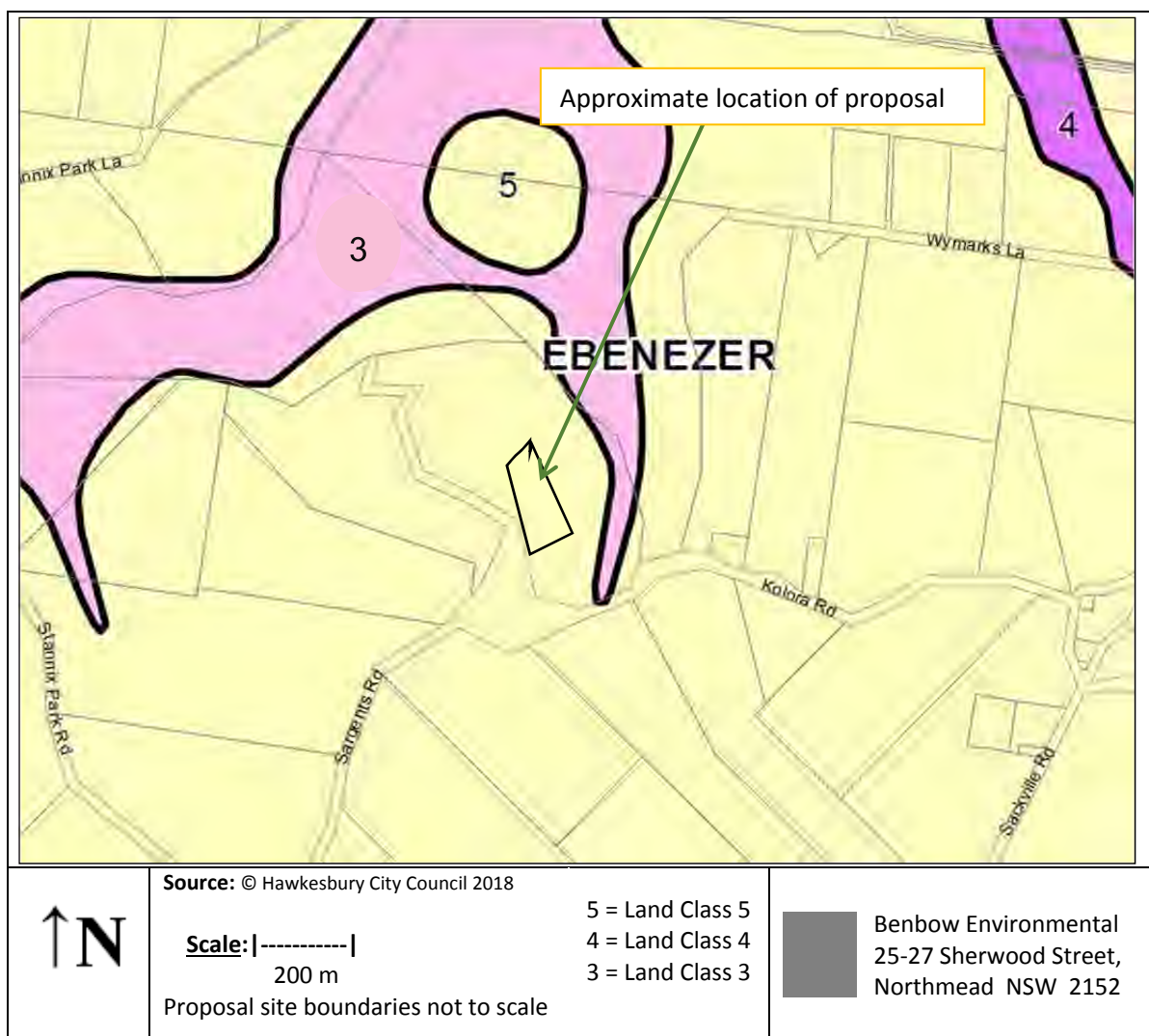
*Works by which the watertable is likely to be lowered; and
Works beyond 1 metre below the natural ground surface.*

Class 5

Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.



Figure 3-1: Acid Sulfate Soil Map



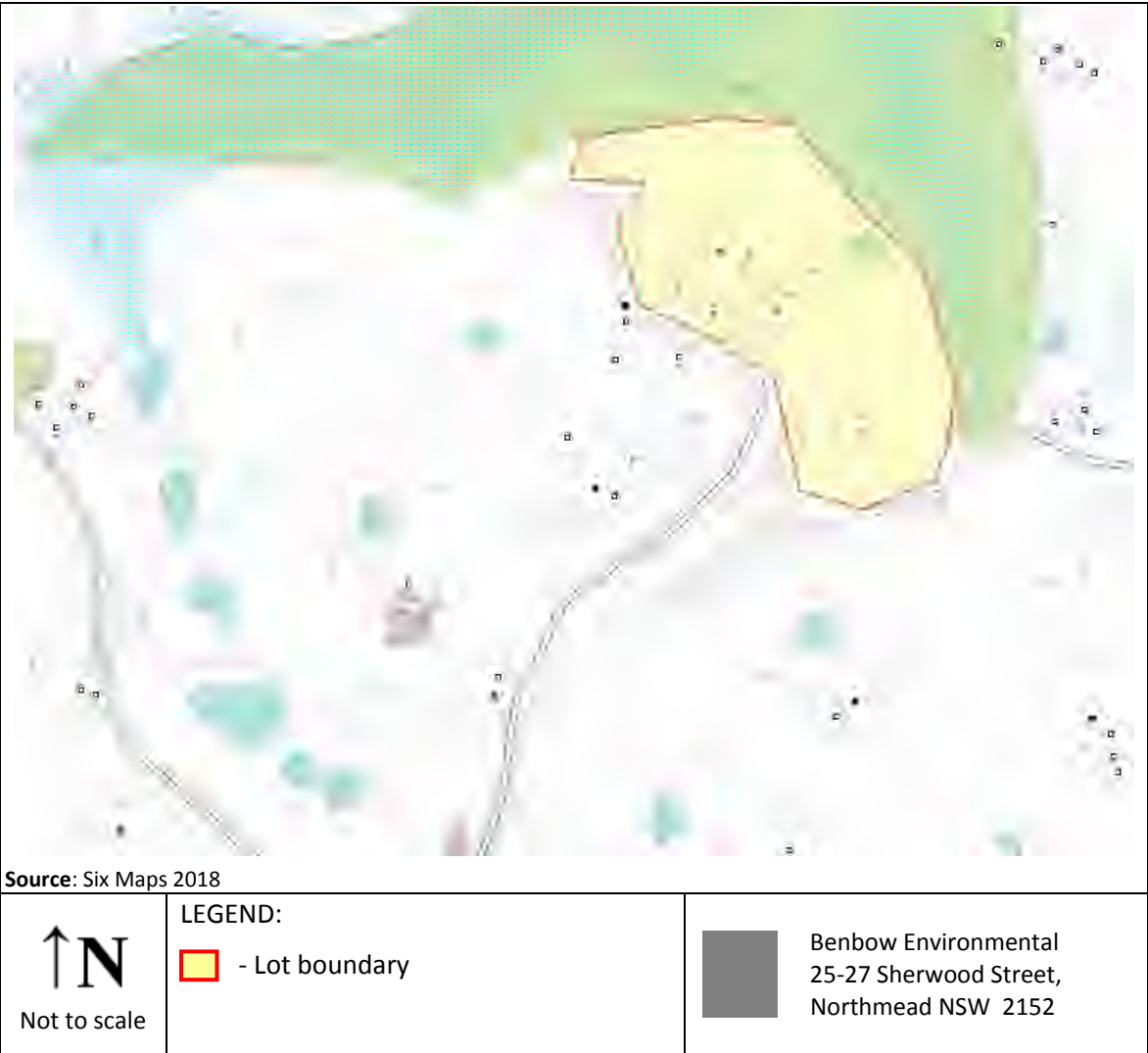
3.3 SURFACE HYDROLOGY AND LOCAL HYDROGEOLOGY

The Upper Hawkesbury River flows from Yarramundi, south of Penrith, where its tidal limit is reached and where the Nepean River “ends”, at the confluence with the Grose River. In the area between Windsor to Sackville, the river is wide and deep, with low flat banks that have been cleared of most riparian vegetation. The Upper Hawkesbury River is a tide dominated, drowned valley estuary. At the end of the last Glacial Maxima (Ice Age), sea-levels rose, flooding steep river valleys along Australia’s eastern coastal regions. The sea water brought dissolved sulfides which were deposited onto soils after the sea’s retreat. It is in these previously flooded regions where tidal flats, salt marshes and mangrove swamps have formed, which have become the dominant areas for pyrite formation. Soils containing pyrite have the potential to produce sulfuric acid if they are drained or excavated (i.e. exposed to air). These soils are highly likely to exist in the swamps along the site’s northern and eastern boundaries and within the site’s deeper, adjacent layers.

Figure 3-2 shows the nearest waterbodies in blue. While clearly identified on a map, many of these water bodies are ephemeral and thus, only present when environmental conditions are favourable.



Figure 3-2: Nearest Waterbodies



3.3.1 Groundwater Bore Search

A search was undertaken to identify the closest groundwater bores located near the site, using the Australian Groundwater Explorer by the Australian Bureau of Meteorology and the groundwater monitoring overview map by the NSW Office of Water.

According to these resources, there are four groundwater bores within 600 m of the site. A summary of information available for these is provided below in Table 3-1.



Table 3-1: Available Data for Groundwater Bores Near the Subject Site

Bore	Bore Depth (m)	Drilled date	Purpose	Standing Water Level (m)	Lithology (depths mbs)	Salinity	Location Co-ordinates
GW109944.1.1	120	2009-02-18	stock	47	sandstone	128 mg/L	-33.526442° 150.863731°
GW100980.1.1	150	1997-08-27	stock	41	sandstone	176 mg/L	-33.529536° 150.861712°
GW105911.1.1	122	2003-08-22	stock	41	sandstone	300 mg/L	-33.525529° 151.870569°
GW059293.1.1	1.8	2003-01-29	stock	no data	sandstone	no data	-33.525925° 151. 869490°



4. SITE HISTORY

The location of the site and a site layout has been presented in Section 2 of this report.

A review of the site history was carried out and comprised the following:

- Review of current and historical land title search;
- Review of historical aerial photographs;
- Review of NSW EPA records;
- Review of Hawkesbury Council records including DA history; and
- Review of Section 10.7(2) & (5) planning certificate.

4.1 TITLE SEARCH

A title search was undertaken for the land holdings and these are presented in Attachment 1. Summaries are provided below:

Lot 288, DP751665

For this land holding there are no notifications.

4.2 HISTORICAL TITLE SEARCH

No relevant information was gained from the analysis of the historical land title search transactions.

The Historical Land Title Search documents have been included in Attachment 2.

4.3 AERIAL PHOTOGRAPHS

Aerial photographs obtained from the NSW Department of Lands and Google Earth for the following years, 1955, 1965, 1975, 1986, 1994, 2005 and 2016, were reviewed to describe site features and surrounding areas at various timelines:

The historical aerial photographs and Google Earth captures have been included in Attachment 3. Boundaries depicting the proposal's area are shown in red on each photograph.

The review is presented below in Table 4-1.



Table 4-1: Summary of Historical Aerial Photographs

Year	Site	Surrounding Areas
1955	The subject site is completely forested. Cleared areas are visible within the larger parent lot, NW of the subject site.	A water hole/pond is located immediately above the site's northern point. Most of the parent lot has been cleared of vegetation with trees lining the boundaries. A single dwelling with a small shed is visible approx. 90 m north of the site. Furrow marks are visible in the paddock NW of the subject site, which appears to have been used for agricultural purposes. Some areas further away from the site have been cleared with agriculture plots in use. The area would be described as rural farmland.
1965	The subject site has not changed and remains completely forested.	The waterhole appears to be dry. An increase in cleared and cultivated land (away from parent lot) is evident. Built structures have increased in number within the surrounding district.
1975	The site has almost been fully cleared of vegetation. Some trees remain in the SW and the SE corners.	Some vegetation has been cleared immediately south of the parent site.
1986	The site shows evidence of erosion with bare patches and scouring having appeared to have occurred along the slopes. The pond immediately north of the site is full (the site visit revealed patches were most likely to be exposed sandstone).	A commercial development has been established approx. 500 m south along Sargents Rd. Built structures have increased in number in surrounding areas.
1994	Some ground covering has returned including some scatted trees. The south east corner is forested. A dirt track leads to the water hole from the eastern half of the site. Another dirt road runs along the site's NE boundary.	Increased built development, within the surrounding areas, has occurred with additional buildings, roads and small hamlets now visible. The surrounding landscape appears very dry and brown in colour.
2005	The trees in the SE corner have been cleared, some scattered trees remain. The dirt tracks are no longer visible. The ground appears covered in grasses. A small dark patch with three whitish blotches is present approximately halfway along the NW boundary. (Visual evidence from the site visit suggests erosion patches due to paddocked horses).	The surrounding district is greener in appearance, with an increase in built structures.
2016	The site has more trees. Bare earthen patches, are visible within the grassy areas.	More development has occurred, as evidenced by an increase in built structure density, with a subsequent marked decrease in overall tree canopy coverage.



4.4 NSW EPA RECORDS

4.4.1 CLM Act 1997

The NSW EPA publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act. However, it should be noted that the EPA record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

A search of the EPA's public contaminated land register revealed:

- No land was identified as contaminated within Ebenezer

4.4.2 POEO Register

The NSW EPA publishes records under the Protection of the Environmental Operations (POEO) Act 1997 (as amended 2011). A search of the register revealed the following:

- No notices have been issued for the site or immediately adjacent sites.
- A clean up notice was issued to David and Rachel McClure of 158 Portland Head Road Ebenezer, on 10 January 2017, to remove contaminated fill brought onto their property.
- No other records of notices were identified in Ebenezer.
- A clean up notice was issued to a property in Sackville for the illegal storage of waste tyres in 2014.

4.5 HAWKESBURY CITY COUNCIL

4.5.1 Past Consents

The following table presents a summary of Council development and building application records for the parent lot.

Table 4-2: Summary of Council Development and Building Application / Consent Records

Year	Number	Description
1985	BA1397/85	Hall and dormitory block
1983	DA0251/83	Youth camp

4.5.2 Section 10.7 (2) & (5) Certificate

A Planning certificate under section 10.7 (2) and (5) of the EPA & Act 1979 was obtained (Attachment 4) from Hawkesbury City Council for the land holding as detailed below:

- Address: 99 Sargents Road Ebenezer
- Description: Lot 288 DP 751665



- Certificate Number: PC0192/19
- Issue date: 3/08/2018

The Planning Certificate states that there are no matters arising under Section 59(2) of the Contaminated Land Management Act 1997. These can be summarised as follows:

- a) The land to which the certificate relates has not been declared to be significantly contaminated land at the date when the certificate was issued.
- b) The land to which the certificate relates is not subject to a management order at the date when the certificate was issued.
- c) The land to which the certificate relates is not the subject of an approved voluntary management proposal at the date when the certificate was issued.
- d) The land to which the certificate relates is not subject to an ongoing maintenance order as at the date when the certificate was issued.
- e) The land to which the certificate relates is not the subject of a site audit statement provided to the Council.

4.5.3 Additional Site History Supplied By Council

Hawkesbury Council attended the property on the 21/06/2016 in response to concerns of potential illegal development and illegal occupation of multiple dwellings occurring on site. Council spoke to the then, site owner, as well as inspecting the entire property. A summary of Council's findings is presented below.

- The site comprised of two habitable dwellings, the oldest believed to have been constructed over 100 years ago, the other at least 35 years ago (i.e. prior to 1982).
- Four to five stable blocks were identified that were housing horses.
- A third dwelling identified, was located in the "heavily vegetated part of the land". It was described as being "dilapidated and damaged" and not in use. This structure had been re-sited on the premises and after coming to the council's attention in the 1980s, the owners were given notice to make it uninhabitable.

These areas were on the parent Lot of the subject site but not within the immediate site itself. The dilapidated house is 50 m SE of the site.

The documents describing Council's actions and findings are included as Attachment 5.

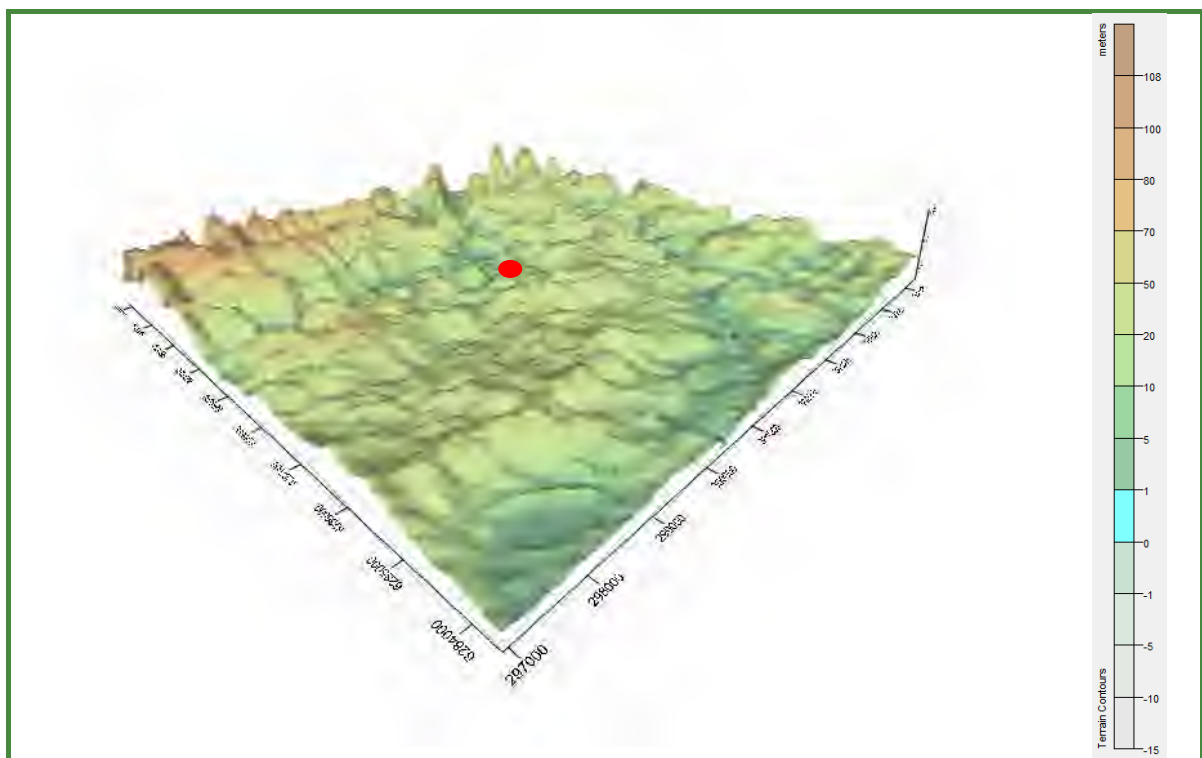


5. SITE CONDITION AND SURROUNDING ENVIRONMENT

5.1 LOCAL TOPOGRAPHY

Figure 5-1 (below) shows the terrain with the z-axis (i.e. vertical axis) exaggerated by a factor of 10 (i.e. a given distance on the x-axis or y-axis appears three times as great on the z-axis) in order to provide a clearer description of the topography. A coloured scale bar shows elevations corresponding to the colours used in the figures. It should be noted that these figures are an approximation of the actual terrain, based on terrain information from NASA SRTM 1-arc second digital elevation models.

Figure 5-1: Local Topography with Vertical Exaggeration of 10



Note: ● = Approximate location of site

5.2 SITE WALKOVER – PHOTOGRAPHIC SECTION

A site walkover was conducted by Benbow Environmental on the 10th April 2019, to verify site conditions and identify any potential contamination sources or discernible evidence of contamination. This section presents the findings of the walkover, accompanied by photographs taken during the visit. Initial findings were of a fully fenced paddock covered in grasses, native trees and many weed species. On the higher slopes (adjacent to Sargents Road), thin sandy soils cover shallow sandstone bedrock with some sandstone protruding from the surface. The soil is thicker on the lower slopes and is dominated by weed species. The paddock is used for equestrian purposes. Three horses were in the fenced area during the site visit.



Photograph 1: The view from Sargents Road, facing NE. The site's western boundary is in the foreground. This is the subject site's most elevated position.



Photograph 2: Looking across the site's middle section as viewed from Sargents Road.





Photograph 3: Looking towards the site's SE boundary from Sargents Road.



Photograph 4: The site as viewed from the western corner, with the northern boundary fence on LHS.





Photograph 5: The site as viewed from the northern corner (viewer is facing SW). Western boundary on RHS.



Photograph 6: The site viewed from the northern corner; viewer is facing SE with eastern boundary on LHS.





Photograph 7: The site's middle as viewed from the eastern boundary fence



Photograph 8: The site as viewed from the eastern corner, viewer is facing west





Photograph 9: The site as viewed from the southern corner; viewer is facing NW along the western boundary. Sargents Rd is faintly visible in LHS of picture. The building in the background is outside of the subject site, its contents are unknown but appears to be a work shed for equestrian uses.



Photograph 10: The site viewed from the southern corner; viewer is facing NE along the eastern boundary fence.





Photograph 11: Bare patches on the ground surface are exposed sandstone rock. The site's western boundary is visible in the background, Sargents Rd is just beyond the fence.



Photograph 12: The centre of the site. Note the fence visible on RHS, this runs across the middle of the site (N to S) and serves as a halfway point.





Photograph 13: Across the site were small, blue-coloured, plastic wrappings presumed to be wind-blown rubbish.



Photograph 14: Acetic acid stored within the larger parent property, approximately 20 m above the NW corner of the subject site. The container appeared to be in a good condition, with no evidence of staining, leaks or odours on or around the container. Tapping on the container's side indicated it was full.





5.3 POTENTIAL CONTAMINATION ISSUES

A Phase I site contamination assessment involves obtaining a thorough understanding of the site history. Based on the information collected on the site, an assessment of the potential contamination issues at the site has been carried out. Details are presented in the following sections of this report.

5.3.1 Asbestos materials

Asbestos was manufactured and used extensively in Australia during most of the twentieth century. It was used in a wide variety of applications, especially as insulation and within many building products. Its use within building materials had ceased by 1989, and was completely banned in Australia in 2003 due to the serious health risks asbestos fibres pose. Houses built before 1989 are highly likely to contain some asbestos-containing material. Such products contain asbestos fibres mixed with other materials (such as cement). Non-friable asbestos (e.g. fibro) is typically the most common form of asbestos material encountered in Australian buildings. If undamaged and painted, this form is stable and poses low risk. However, if non-friable asbestos is damaged or broken, it may release asbestos fibres into the air. Some asbestos products, such as insulation, can be readily reduced to powder (i.e. are friable). In this form asbestos fibres are highly likely to become airborne if disturbed.

All built structures on the property erected before 1989 are likely to contain asbestos, however, as no built structures are within the subject site itself, the risk from asbestos is considered very low.

5.3.2 Radioactive material

None expected on site.

5.3.3 Lead Based Paints

At one time, paint containing lead was found to be useful in protecting surfaces from the effects of weathering. Some paints in Australia *before* 1965 contained 50% lead. Subsequently the levels of lead additive to paint was greatly reduced (to 1% in 1965) and phased out in Australia due to the serious health risks lead poses. By 1997, the amount of lead permitted in paint was 0.001%.

Dwellings erected on the parent Lot before 1965 may contain lead-based paint. However, no built structures are within the subject site itself and no evidence exists of contamination occurring on the subject site due to lead-based paints. Therefore, the risk from lead contamination on the subject site is considered very low.

5.3.4 Chemicals and Fuels Stored on Site

No known chemical storage has occurred on the subject site. No evidence was found in property records or aerial images. However, the site inspection revealed an IBC (Intermediate Bulk Container) holding acetic acid. This was stored near the subject site. Acetic acid can be used as a solvent (vinegar is a 5% solution of acetic acid).



5.3.5 Air Emissions of Pollutants

None associated with the site.

5.3.6 Soil, Surface Water and/or Groundwater Pollution

There is no known evidence of soil or groundwater pollution.

5.3.7 Pesticide and Herbicide Usage and/or Contamination

The site sits within the larger Lot 288, which has been in use as an equestrian stud for over thirty years. It is not known if pesticides were used but it would seem unlikely. Aerial images revealed some agriculture occurred immediately NW of the subject site during the mid-1950s. Possibly pesticides and or herbicides may have been applied during that time. As the land slopes easterly, potentially if chemicals were used, run-off may have occurred with chemicals migrating onto the subject site. However, later images revealed no obvious agricultural use (such as furrows) and any chemical residue (if any existed) would have likely degraded.

It is considered the risk from pesticide/herbicide contamination would be very low.

5.3.8 Electromagnetic Fields

Not relevant to this site.

5.3.9 Wastewater Treatment System

Not relevant to this site.

5.3.10 Waste Disposal

Not relevant to the site.



6. CONCEPTUAL SITE MODEL

A conceptual site model (CSM) has been prepared in accordance with *the National Environment Protection (Assessment of Site Contamination) Measure as amended in 2013*.

The CSM is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors.

The CSM is presented in Table 6-1. There are no known sources of contamination.

Table 6-1: Conceptual Site Model.

Known and Potential Primary Sources of Contamination	Primary Release Mechanism	Potentially Impacted Media	Contaminants of Potential Concern	Potential Receptors		Exposure Pathways		Contamination Risk
				Human	Environment	Human	Environment	
Pesticides/herbicides	Migration through the soil due to precipitation	Soil, groundwater	OCP, OPP ¹	Future site occupants	Soil and groundwater	Dermal contact, ingestion	Soil surface, groundwater	Very low

1. OPP = Organophosphorus pesticides, OCP = Organochlorine pesticides



7. CONCLUSION AND RECOMMENDATION

The findings of the Phase I Environmental Site Assessment are summarised as follows:

The purpose of this study was to verify the potential for soil contaminants to be present on site. The overall finding of the ESA is that the subject site is considered suitable for its proposed use.

A very low potential may exist for some minor soil contamination, due to the possibility of historical pesticide and/or herbicide use, immediately NW of the subject site. However, the potential level of contamination is expected to be negligible as agricultural practises ceased over sixty years ago and potential contaminants are not expected to pose significant risk to human health or the environment.

Further investigation of the site, with regard to a Phase II Assessment, is not considered warranted.

This concludes the report.



Damien Thomas
Graduate Environmental Scientist

R T Benbow
Principal Consultant



8. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Hala Constructions Pty Ltd, as per our agreement for providing environmental services. Only Hala Constructions Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Hala Constructions Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.



9. REFERENCES

Australian Government Bureau of Meteorology, Australian Groundwater Explorer,
Available at: <http://www.bom.gov.au/water/groundwater/explorer/map.shtml>

Australian Soil Resource Information System (ASRIS) CSIRO, [on-line] Available at:
www.asris.csiro.au

Department of the Environment and Energy available at
<http://www.environment.gov.au/protection/chemicals-management/lead/lead-in-house-paint>

Guidelines for Consultants Reporting on Contaminated Sites (OEH August 2011). [on-line]
available at: <https://www.epa.nsw.gov.au/your-environment/contaminated-land/managing-contaminated-land/statutory-guidelines>

Hawkesbury City Council LEP 2012

NEPM Assessment of Site Contamination (NEPC, 1999) amended 2013. [on-line] Available at:
<https://www.legislation.gov.au/Details/F2013C00288>

NSW Government Planning & Environment Resources & Energy, 1:100 000 Geological maps,
Available at: <https://www.resourcesandgeoscience.nsw.gov.au/miners-and-explorers/geoscience-information/products-and-data/maps/geological-maps/1-100-000>

SafeWork NSW
http://www.safework.nsw.gov.au/__data/assets/pdf_file/0009/49887/Asbestos.pdf

ATTACHMENTS

Attachment 1: Land Titles



FOLIO: 288/751665

SEARCH DATE	TIME	EDITION NO	DATE
-----	----	-----	----
1/8/2018	3:53 PM	8	30/8/2017

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY NATIONAL AUSTRALIA BANK LIMITED.

LAND

LOT 288 IN DEPOSITED PLAN 751665
LOCAL GOVERNMENT AREA HAWKESBURY
PARISH OF WILBERFORCE COUNTY OF COOK
(FORMERLY KNOWN AS PORTION 288)
TITLE DIAGRAM CROWN PLAN 1653.1507

FIRST SCHEDULE

IBRAHIM ALAMEDDINE
HALA ALAMEDDINE
AS JOINT TENANTS (T AM688272)

SECOND SCHEDULE (4 NOTIFICATIONS)

- 1 LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT 1989)
- 2 RESTRICTION ON USE (PREVENTION OF SUBDIVISION), SEE SECTION 77B
CROWN LANDS ACT 1989 SEE AG459596
- 3 RESTRICTION ON THE USE OF LAND PURSUANT TO SECTION 77A CROWN
LANDS ACT 1989 SEE AG459596
- 4 AM688273 MORTGAGE TO NATIONAL AUSTRALIA BANK LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Attachment 2: Historical Land Title



SEARCH DATE

1/8/2018 3:54PM

FOLIO: 288/751665

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14702 FOL 29

Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
14/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
8/7/1992		CONVERTED TO AUTO CONSOL 14702-29	CONSOL CREATED CT NOT ISSUED
14/7/1992		AMENDMENT: NATURE OF ESTATE	
7/4/1995	0135307	EXCISED FROM AUTO CONSOL 14702-29	
10/4/1995		AMENDMENT: NATURE OF ESTATE	
10/4/1995	0150934	DEPARTMENTAL DEALING	EDITION 2
11/9/1996	2449285	WITHDRAWAL OF CAVEAT	
11/9/1996	2449286	CHANGE OF NAME	
11/9/1996	2449287	MORTGAGE	EDITION 3
29/7/1997	3274262	MORTGAGE	EDITION 4
25/3/1999	5705353	MORTGAGE	EDITION 5
19/8/2002	8775869	TRANSFER SEVERING JOINT TENANCY	
4/6/2004	AA693912	DISCHARGE OF MORTGAGE	
4/6/2004	AA693913	DISCHARGE OF MORTGAGE	
4/6/2004	AA693914	TRANSFER	
4/6/2004	AA693915	MORTGAGE	EDITION 6
26/10/2005	AB865400	DISCHARGE OF MORTGAGE	
26/10/2005	AB865401	MORTGAGE	EDITION 7
14/10/2011	AG557666	DEPARTMENTAL DEALING	
14/10/2011	AG459596	DEPARTMENTAL DEALING	
14/10/2011	AG459587	APPLICATION FOR RECORDING OF ACTION AFFECTING CROWN HOLDING	
30/8/2017	AM688271	DISCHARGE OF MORTGAGE	
30/8/2017	AM688272	TRANSFER	

END OF PAGE 1 - CONTINUED OVER

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PRINTED ON 1/8/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

1/8/2018 3:54PM

FOLIO: 288/751665

PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
30/8/2017	AM688273	MORTGAGE	EDITION 8 CORD ISSUED

*** END OF SEARCH ***

181084

PRINTED ON 1/8/2018

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Received: 01/08/2018 15:54:48

Attachment 3: Historical Aerial Photographs

1955



1955 enlarged



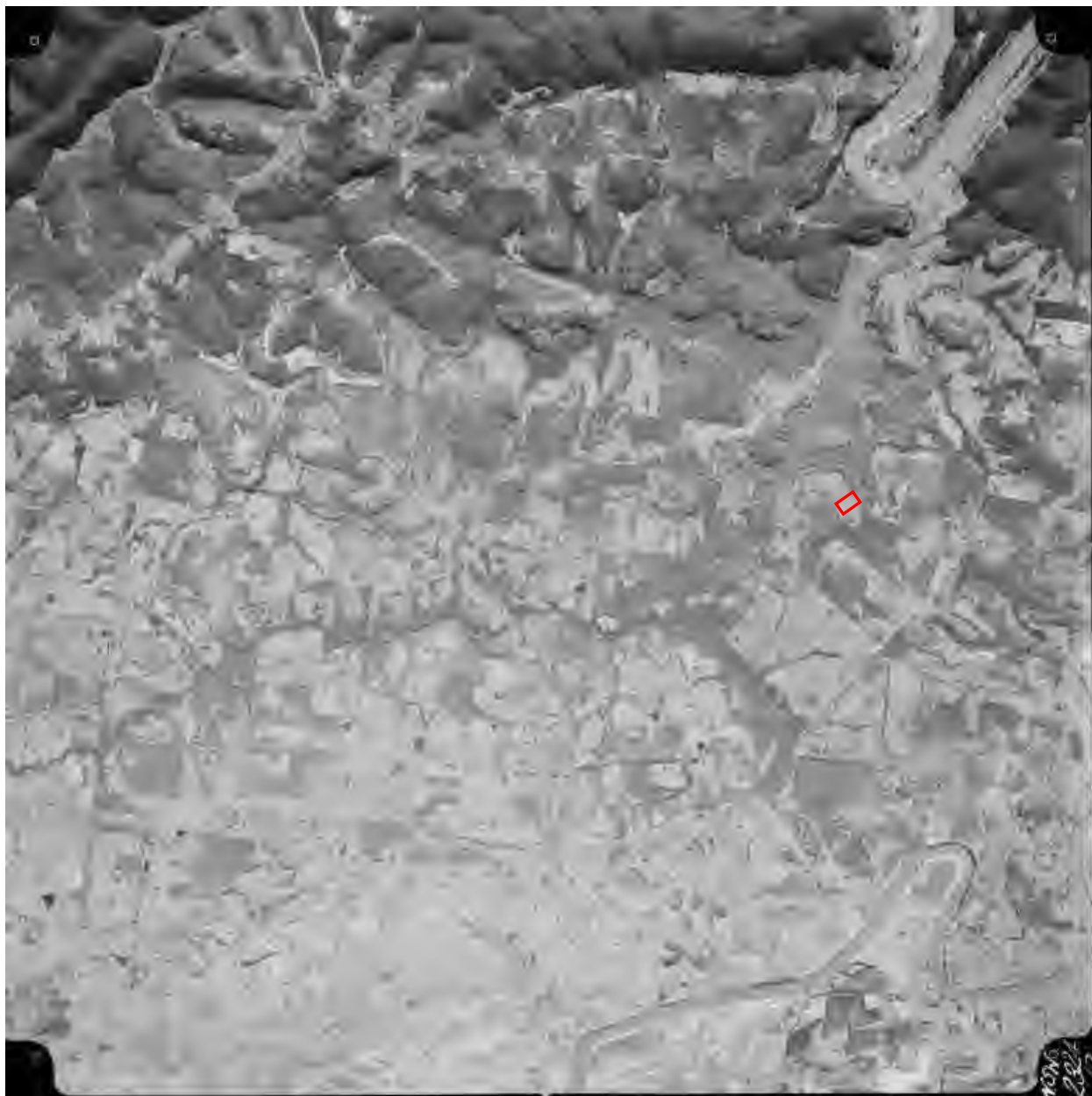
1965



1965 enlarged



1975



1975 enlarged



1986



1986 enlarged



1994



1994 enlarged



2005



2005 enlarged



2016 (Google Earth)



2016 enlarged



Attachment 4: Section 10.7 (2) & (5) Certificate



Planning Certificate

Issued under Section 10.7 of the *Environmental Planning and Assessment Act, 1979*

Benbow Environmental Pty Ltd
PO Box 687
PARRAMATTA NSW 2124

admin@benbowenviro.com.au

Certificate Number PC0192/19
Your Reference 181084
Date of Endorsement 3 August 2018

Location

Land Description Lot 288 DP 751665 Vol 6580 Fol 23, 99 Sargents Road EBENEZER NSW 2756

The following information is only applicable as of the date of this certificate and is provided pursuant to Section 10.7 of the *Environmental Planning and Assessment Act 1979*, as prescribed by Schedule 4 of the *Environmental Planning and Assessment Regulation 2000*.

Information pursuant to Section 10.7(2) of the Act

1 Names of relevant planning instruments and Development Control Plans

- 1.1 The land is affected by the following environmental planning instruments:
Hawkesbury Local Environmental Plan 2012

Sydney Regional Environmental Plan No 9 - Extractive Industry (No 2 - 1995)

Identifies regionally significant extractive resources within the Sydney Region to facilitate their utilisation. The plan ensures extraction is carried out in an environmentally acceptable manner and prohibits extraction from certain environmentally sensitive areas. It ensures that decisions on future urban expansion take into account the ability to realise the full potential of important deposits.

Sydney Regional Environmental Plan No 20 - Hawkesbury Nepean River (No 2 - 1997)

SREP No 20 (No 2 - 1997) was gazetted on 6 November 1997, and is accompanied by the 'Hawkesbury-Nepean Action Plan 1997' and 'Codes of Practice for Consultation'.

The aim of *SREP No 20 (No 2 - 1997)* is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context.

SREP No 20 (No 2 - 1997) requires development consent for the purpose of caravan parks or camping grounds; composting facilities or works; buildings works or land uses within conservation area sub-catchments; remediation of contaminated land; filling; certain activities in relation to items of non-aboriginal heritage; intensive horticulture industries; some intensive animal industries; manufactured home estates; marinas; recreational facilities; land uses in or near the river; land uses in riverine scenic areas; sewerage systems or works.





Development for extractive industries is prohibited in some areas. Consent of Council and the concurrence of the Director-General is required for maintenance dredging and extractive operations carried out downstream of the Wallacia Bridge as a consequence of, and ancillary to, works for flood mitigation, bank stabilisation, the construction of bridges or other instream structures (such as marinas) or the licensed or unlicensed withdrawal of water where extraction is necessary to carry out the works. Some intensive animal industries and potentially hazardous or offensive industries are prohibited if carried out on a floodway. Development in mapped wetlands requires the consent of Council and the concurrence of the Director-General of Urban Affairs and Planning.

State Environmental Planning Policy No 19 - Bushland in Urban Areas

Protects and preserves bushland within certain urban areas, as part of the natural heritage or for recreation, educational and scientific purposes. The SEPP is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.

State Environmental Planning Policy No 21 - Caravan Parks

Ensures that where caravan parks or camping grounds are permitted under an environmental planning instrument, movable dwellings, as defined in the *Local Government Act 1993*, are also permitted. The specific kinds of movable dwellings allowed under the *Local Government Act* in caravan parks and camping grounds are subject to the provisions of the Caravan Parks Regulation. The SEPP ensures that development consent is required for new caravan parks and camping grounds and for additional long-term sites in existing caravan parks. It also enables, with the council's consent, long-term sites in caravan parks to be subdivided by leases of up to 20 years.

State Environmental Planning Policy No 30 - Intensive Agriculture

Requires development consent for cattle feedlots having a capacity of 50 or more cattle or piggeries having a capacity of 200 or more pigs. The SEPP sets out information and public notification requirements to ensure there are effective planning control over this export-driven rural industry. The SEPP does not alter if, and where, such development is permitted, or the functions of the consent authority.

State Environmental Planning Policy No 33 - Hazardous and Offensive Development

Provides definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must carefully consider the specifics of the case, the location and the way in which the proposed activity is to be carried out. The SEPP also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the SEPP. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The SEPP does not change the role of councils as consent authorities, land zoning, or the designated development provisions of the *Environmental Planning and Assessment Act 1979*.

State Environmental Planning Policy No 44 - Koala Habitat Protection

Encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. Local councils cannot approve development in an area affected by the SEPP without an investigation of core koala habitat. The SEPP provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of koalas and their habitat.

State Environmental Planning Policy No 50 - Canal Estate Development

Bans new canal estates from the date of gazettal, to ensure coastal and aquatic environments are not affected by these developments.



State Environmental Planning Policy No 55 - Remediation of Land

Introduces state-wide planning controls for the remediation of contaminated land. The SEPP states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The SEPP makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals.

State Environmental Planning Policy No 62 - Sustainable Aquaculture

Encourages the sustainable expansion of the industry in NSW. The SEPP implements the regional strategies already developed by creating a simple approach to identify and categorise aquaculture development on the basis of its potential environmental impact. The SEPP also identifies aquaculture development as a designated development only where there are potential environmental risks.

State Environmental Planning Policy No 64 - Advertising and Signage

Aims to ensure that outdoor advertising is compatible with the desired amenity and visual character of an area, provides effective communication in suitable locations and is of high quality design and finish.

State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development

Raises the design quality of residential flat development across the state through the application of a series of design principles. Provides for the establishment of Design Review Panels to provide independent expert advice to councils on the merit of residential flat development.

State Environmental Planning Policy No 70 - Affordable Housing (Revised Schemes)

Extends the life of affordable housing provisions relating to: *Sydney Regional Environmental Plan No. 26 - City West*, *Willoughby Local Environmental Plan 1995* and *South Sydney Local Environmental Plan 1998*. Schemes such as these are helping to provide affordable housing in areas undergoing significant redevelopment.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

This SEPP operates in conjunction with *Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004* to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX throughout the State by overriding competing provisions in other environmental planning instruments and development control plans, and specifying that SEPP 1 does not apply in relation to any development standard arising under BASIX.

State Environmental Planning Policy (State Significant Precincts) 2005

Defines certain developments that are major projects under Part 3A of the *Environmental Planning & Assessment Act 1979* and determined by the Minister for Planning. The SEPP also lists State significant precincts.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The SEPP aims to provide for the proper management and development of mining, petroleum and extractive material resources for the social and economic welfare of the State. The SEPP establishes appropriate planning controls to encourage ecologically sustainable development.

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

Provides for the erection of temporary structures. The SEPP supports the transfer temporary structures (such as tents, marquees and booths) from the *Local Government Act 1993* to the *Environmental Planning and Assessment Act 1979*.



State Environmental Planning Policy (Repeal of Concurrence and Referral Provisions) 2004

Amends various environmental planning instruments so as to omit provisions requiring consent authorities to obtain certain concurrences or refer matter to various persons or bodies.

State Environmental Planning Policy (State and Regional Development) 2011

The aims of this SEPP are to identify development that is State significant development, to identify development that is State significant infrastructure and critical State significant infrastructure, to confer functions on joint regional planning panels to determine development applications.

State Environmental Planning Policy (Repeal of Concurrence and Referral Provisions) 2008

Removes duplicative or unnecessary requirements in environmental planning instruments which require concurrence from or referral to government agencies.

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

Aims to provide streamlined assessment processes for development that complies with specified development standards.

State Environmental Planning Policy (Affordable Rental Housing) 2009

Aims to provide a consistent planning regime for the retention and provision of affordable rental housing.

State Environmental Planning Policy (Infrastructure) 2007

Provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

State Environmental Planning Policy (Integration and Repeals) 2016

This SEPP repealed a number of SEPPs and deemed SEPPs including State Environmental Planning Policy No 32-Urban Consolidation (Redevelopment of Urban Land) and Sydney Regional Environmental Plan No 19-Rouse Hill Development Area.

State Environmental Planning Policy (Vegetation in Non-Urban Areas)

The aim of this Policy is to protect the biodiversity values and the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

State Environmental Planning Policy (Coastal Management) 2018

This Policy promotes an integrated and co-ordinated approach to land use planning in the coastal zone consistent with the objects of the *Coastal Management Act 2016* through the mapping of coastal management areas and the establishment of a land use planning framework, including controls for development within the coastal zone.

The land may be affected by the following environmental planning instrument:

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

Encourage the development of high quality accommodation for our aging population and for people who have disabilities - housing that is in keeping with the local neighbourhood.

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

The aim of this Policy is to facilitate the effective delivery of educational establishments and early education and care facilities across the State by providing a consistent planning regime including the establishment of



consistent assessment requirements, design considerations and consultation for these types of development.

- 1.2 The land is affected by the following proposed environmental planning instruments that are or have been the subject of community consultation or on public exhibition under the *Environmental Planning and Assessment Act 1979* (excludes instruments where Council has been notified that the making of the proposed instrument has been deferred indefinitely or has not been approved):

Draft State Environmental Planning Policy - Integrating Land Use and Transport

Draft State Environmental Planning Policy (Application of Development Standards) 2004

Draft State Environmental Planning Policy (Competition) 2010

Draft State Environmental Planning Policy (Infrastructure) Amendment (Review) 2016

Amendment to State Environmental Planning Policy No. 44 Koala Habitat Protection

Draft State Environmental Planning Policy (Primary Productions and Rural Development) 2017

Draft State Environmental Planning Policy (Environment) 2017

Amendment to State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2014 – Site Compatibility Certificates

Amendment to State Environmental Planning Policy No. 55 – Remediation of Land

Amendment to Standard Instrument Local Environment Plan – Retail land use definitions

Amendment to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 – Housekeeping Amendments

- 1.3 The land is affected by the following Development Control Plans:

Hawkesbury Development Control Plan 2002

Note: In this section a proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2 Zoning and land use under relevant Local Environmental Plans

- 2.1 The land is zoned:

RU1 Primary Production under *Hawkesbury Local Environmental Plan 2012*.

- 2.2 Under the provisions of *Hawkesbury Local Environmental Plan 2012* the purposes for which development may be carried out within the zone without development consent are referred to in the Land Use Table Annexure.

- 2.3 Under the provisions of *Hawkesbury Local Environmental Plan 2012* the purposes for which development may not be carried out within the zone except with development consent are referred to in the Land Use Table Annexure.

- 2.4 Under the provisions of *Hawkesbury Local Environmental Plan 2012* the purposes for which the carrying out of development is prohibited within the zone are referred to in the Land Use Table Annexure.

The following special provisions of *Hawkesbury Local Environmental Plan 2012* may apply to the subject land:

- Clause 2.5 Additional permitted uses for particular land.



- Clause 2.6 Subdivision – consent requirements.
- Clause 2.7 Demolition requires development consent.
- Clause 2.8 Temporary use of land.
- Part 3 Exempt and complying development.
- Clause 4.2 Rural subdivision.
- Clause 4.2A Residential development and subdivision prohibited on certain land.
- Clause 5.1 Relevant acquisition authority.
- Clause 5.1A Development on land intended to be acquired for public purposes.
- Clause 5.3 Development near zone boundaries.
- Clause 5.7 Development below mean high water mark.
- Clause 5.8 Conversion of fire alarms.
- Clause 5.10 Heritage conservation.
- Clause 5.11 Bush fire hazard reduction.
- Clause 5.12 Infrastructure development and use of existing buildings of the Crown.
- Clause 6.1 Acid sulfate soils.
- Clause 6.2 Earthworks.
- Clause 6.11 Residential accommodation at Johnston and New Streets, Windsor.
- Clause 6.12 Certain development at Richmond Lowlands.

These special provisions may alter the development shown in the Land Use Table which may be carried out with or without development consent and prohibited land uses. Please refer to the above mentioned provisions of *Hawkesbury Local Environmental Plan 2012* to determine applicability.

- 2.5 Has Council adopted any development standards providing fixed minimum land dimensions for the erection of a dwelling house on the land?

No.

- 2.6 Does the land include or comprise critical habitat?

No.

- 2.7 Is the land in a conservation area under *Hawkesbury Local Environmental Plan 2012* or a proposed instrument referred to in section 1 of this certificate (other than a SEPP or proposed SEPP)?

No.

- 2.8 Is an item of environmental heritage under *Hawkesbury Local Environmental Plan 2012* or a proposed instrument referred to in section 1 of this certificate (other than a SEPP or proposed SEPP) situated on the land?

No.

Note: The land may also be subject to a proposed environmental planning instrument (see section 1.2 of this certificate) that may change the information given in this section of the certificate.

- 3 Complying Development under each of the codes for complying development because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3), and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.**

- 3.1 Housing Code.

Can complying development under the Housing Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).



3.2 Housing Alterations Code.

Can complying development under the Housing Alterations Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.3 Commercial and Industrial Alterations Code.

Can complying development under the Commercial and Industrial Alterations Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.4 Subdivisions Code.

Can complying development under the Subdivisions Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.5 Rural Housing Code.

Can complying development under the Rural Housing Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.6 General Development Code.

Can complying development under the General Development Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.7 Demolition Code.

Can complying development under the Demolition Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral*



Rainforests Area Map (within the meaning of State Environmental Planning Policy (Coastal Management) 2018).

3.8 Commercial and Industrial (New Buildings and Additions) Code.

Can complying development under the Commercial and Industrial (New Buildings and Additions) Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.9 Container Recycling Facilities Code

Can complying development under the Container Recycling Facilities Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.10 Fire Safety Code

Can complying development under the Fire Safety Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.11 Greenfield Housing Code

Can complying development under the Greenfield Housing Code be carried out on the subject land?

In part. Complying development cannot be carried out on that part of the land that:

- Is within 100m of land identified as 'coastal wetlands' on the *Coastal Wetlands and Littoral Rainforests Area Map* (within the meaning of *State Environmental Planning Policy (Coastal Management) 2018*).

3.12 Low Rise Medium Density Housing Code

The Low Rise Medium Density Housing Code does not apply to the Hawkesbury Local Government Area at this time.



4 Repealed

4A Repealed

4B Annual charges under *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works

Has the owner (or any previous owner) of the land consented in writing to the land being subject to annual charges under Section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of Section 553B of that *Local Government Act 1993*)?

No.

Note: 'Existing coastal protection works' are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of Section 553B of the *Local Government Act 1993*.

5 Mine Subsidence

Is the subject land within a mine subsidence district within the meaning of Section 20 of the *Coal Mine Subsidence Compensation Act 2017*?

No.

Note: Section 5 Mine Subsidence, Schedule 4 Planning Certificates of the *Environmental Planning Assessment Regulation 2000* will be updated shortly to reflect the above.

6 Road widening and road realignment

Is the land affected by road widening or road re-alignment under Division 2 of Part 3 of the *Roads Act 1993*, or any environmental planning instruments, or any resolution of Council?

No.

7 Council and other public authority policies on hazard risk restrictions

Has Council adopted a policy or has any other public authority notified Council for the purpose of planning certificates of a policy that restricts the development of the land because of the likelihood of:

a) Landslip.

No.

b) Bushfire risk.

No.

c) Tidal inundation.

No.

d) Subsidence.

No.

e) Acid sulfate soils.

Yes.



f) Any other risk (other than flooding)?

No.

7A Flood Related Development Controls Information

a) Is the land or part of the land subject to flood related development controls for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing)?

The land is subject to riverine flood related development controls.

b) Is the land or part of the land subject to flood related development controls for any other purpose not included in a) above?

The land is subject to riverine flood related development controls.

Note: Words and expressions in this section have the same meanings as in the standard instrument set out in the *Standard Instrument (Local Environmental Plans) Order 2006*.

The above responses are provided in relation to the flood related development controls of *Hawkesbury Local Environmental Plan 2012*. Some State or Regional planning instruments may contain flood related development controls which affect the land. These include, but are not necessarily restricted to, *State Environmental Planning Policy (Exempt and Complying Development Code) 2008*, *State Environmental Planning Policy No 30 - Intensive Agriculture*, *State Environmental Planning Policy (Infrastructure) 2007*, *State Environmental Planning Policy No 62 - Sustainable Aquaculture*, *State Environmental Planning Policy (Sydney Region Growth Centres) 2006*, *Sydney Regional Environmental No 9 – Extractive Industry (No 2 – 1995)*, and *Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997)*.

8. Land Reserved for Acquisition

Is the land affected by any environmental planning instrument, or proposed environmental planning instrument referred to in section 1 of this certificate, which makes provision for the acquisition of the land by a public authority, as referred to in Section 3.15 of the *Environmental Planning and Assessment Act 1979*?

No.

9 Contributions Plans

The *Hawkesbury Section 94 Contributions Plan 2015* applies to the subject land.

The *Hawkesbury Section 94A Contributions Plan 2015* applies to the subject land.

9A Biodiversity certified land

Is the land biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

No.

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016*.

10 Biodiversity stewardship sites

Has Council been notified that the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*?

No.



Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016*.

10A Native vegetation clearing set asides

Does the land contain a set aside area under section 60ZC of the *Local Land Services Act 2013*?

No.

11 Bush fire prone land

Is the land bush fire prone land (as defined by the *Environmental Planning and Assessment Act 1979*)?

All of the land is bush fire prone.

12 Property Vegetation Plans

Has Council been notified that the land is land to which a property vegetation plan approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies?

No.

13 Orders under *Trees (Disputes Between Neighbours) Act 2006*

Has Council been notified whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land?

No.

14 Directions under Part 3A

Is the land subject to an in force direction under Section 75P(2)(c1) of the *Environmental Planning and Assessment Act 1979*?

No.

15 Site compatibility certificates and conditions for seniors housing

15.1 Is the land subject to a current site compatibility certificate (seniors housing), of which Council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*?

No.

15.2 Has Council granted a development consent after 11 October 2007 in respect of the land, setting out any terms of a kind referred to in clause 18(2) of the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*?

No.

16 Site compatibility certificates for infrastructure, schools or TAFE establishments

Is the land subject to a valid site compatibility certificate (infrastructure), or site compatibility certificate (schools or TAFE establishments), of which Council is aware?

No.



17 Site compatibility certificates and conditions for affordable rental housing

17.1 Is the land subject to a current site compatibility certificate (affordable rental housing), of which Council is aware?

No.

17.2 Is the land subject to a statement setting out any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that has been imposed as a condition of consent to a development application?

No.

18 Paper subdivision information

18.1 Is the land subject to a development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot?

No.

18.2 Is the land subject to a subdivision order?

No.

Note: Words and expressions used in this section have the same meaning as they have in Part 16C of the *Environmental Planning and Assessment Regulation 2000*.

19 Site verification certificates for biophysical strategic agricultural lands

Is the land subject to a current site verification certificate (biophysical strategic agricultural land), of which Council is aware?

No.

Note: A site verification certificate sets out the relevant State Government department Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land - see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.

20 Loose-fill asbestos insulation

Does the land contain any residential premises that is listed on the Loose-Fill Asbestos Insulation Register (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*)?

No.

21 Affected building notices and building product rectification orders

21.1 Is the land subject to an in force affected building notice (within the meaning of Part 4 of the *Building Products (Safety) Act 2017*), of which Council is aware?

No.

21.2 (a) Is the land subject to an in force affected building product rectification order (within the meaning of the *Building Products (Safety) Act 2017*) that has not been fully complied with?

No.



- (b) Is the land subject to a notice of intention to make a building product rectification order (within the meaning of the *Building Products (Safety) Act 2017*), of which Council is aware has been given, and that is outstanding?

No.

Additional Matters

Certain prescribed matters under Section 59(2) of the *Contaminated Land Management Act 1997 (CLMA 1997)*.

- a) Is the land significantly contaminated land within the meaning of the CLMA 1997?

No.

- b) Is the land subject to a management order within the meaning of the CLMA 1997?

No.

- c) Is the land subject to an approved voluntary management proposal within the meaning of the CLMA 1997?

No.

- d) Is the land subject to an ongoing maintenance order within the meaning of the CLMA 1997?

No.

- e) Is the land subject to a site audit statement within the meaning of the CLMA 1997?

No.

Information pursuant to Section 10.7(5) of the Act

Applicants are advised that Council does not accept any liability in respect of any advice provided under the heading 'Development Consent'.

Preservation of trees and vegetation

The *Hawkesbury Local Environmental Plan 2012*, *State Environmental Planning Policy (Vegetation in Non-Urban Areas) 2017* and the *Hawkesbury Development Control Plan 2002* contain provisions which relate to the preservation of trees and vegetation throughout the local government area.

Development Consent

Has a development consent which applies to the subject land been issued within the past five years? If a development consent has been issued within the past five years, reference should be made to Section 4.53 of the *Environmental Planning and Assessment Act 1979* to determine whether or not the consent has lapsed.

No.

Enquiries

For any enquiries please contact Customer Service on (02) 4560 4444.

A handwritten signature in blue ink, appearing to read 'Chris Carloss'.

Chris Carloss | Authorised Officer | Hawkesbury City Council

www.hawkesbury.nsw.gov.au

Attachment 5: Council Correspondence

Document Set Id 5303713 Version 1

Field	Value
Quick Add Profile	HCC.SSCS_CR - Illegal Development Without Consent
Document Precs	Customer Request - Development Control - Inspect - Suspected illegal development - 99 Sargents Road Wilberforce - Illegal occupation of multiple dwellings.
Class Name	All Staff Access
Date Registered	19-Jan-2016 11:28:38
Document Date	19-Jan-2016 11:28:38
Date Received	19-Jan-2016 11:28:38
Author	
Internal Reference	
External Reference	
Contains Confidential Info	
Date Locked	
Call Site	
Call Type	
Registration Officer	Bridget VANDERBURG
Responsible Officer	
Locked By	

NOTE**Note Id 5588686****Subject:** Action Required**Created:** 19-Jan-2016 11:35 by Vanderberg, Bridget**For:** Document Set Id 5303713, Version 1

This property appears to have 5 dwellings on it. They are paying for 4 bin services. There is an approval for a Youth Camp (which I have ordered the file for). The Youth Camp is no longer in operation and the other dwellings are being rented out individually. This seems to be a similar case to the next door property at 79 Sargents Rd (Doc set id 5262644) same owner surname. Please investigate. I will forward the DA file when it arrives from Kingswood.

NOTE**Note Id 5630004****Subject:** Action Required**Created:** 26-Feb-2016 04:26 by Collins, Garry**For:** Document Set Id 5303713, Version 1

Phil

New task : use

Could you please investigate the concerns raised and take appropriate action in accordance with Council's Enforcement Policy.

Ensuring that you provide up to date file notes of Council's actions and responses in accordance with Councils Customer Contact & Service Standard

Thank you

Garry Collins
Co ordinator

NOTE

Note Id 5660386

Subject: Action Required

Created: 30-Mar-2016 08:24 by Khalifeh, Philip

For: Document Set Id 5303713, Version 1

11.45am Monday 7.3.16- attended and spoke to the owner- [REDACTED] who advised that his parents previously owned the property. He has been residing there for over 35 years and that there has always been two residences on the property.

Both dwellings appear to have been present for many years.

Files ordered.

enquiries pending.

NOTE**Note Id 5677427****Subject:** Action Required**Created:** 14-Apr-2016 11:00 by Vanderberg, Bridget**For:** Document Set Id 5303713, Version 1

<http://raywhitekurrajong.com.au/nsw/ebenezer/390868/>

This is the ad for renting out one of the other dwellings. A Customer service officer had looked at an attached secondary dwelling to the main house that was also separately leased.

NOTE**Note Id 5701957****Subject:** Tasked to Phil for further action.**Created:** 10-May-2016 04:32 by MITCHELL, Tanya**For:** Document Set Id 5303713, Version 1

NOTE

Note Id 5732839

Subject: Action Required

Created: 09-Jun-2016 10:09 by Khalifeh, Philip

For: Document Set Id 5303713, Version 1

property to be re inspected.

Owner contacted T.D. and message left.

NOTE

Note Id 5744925

Subject: Action Complete

Created: 21-Jun-2016 04:00 by Khalifeh, Philip

For: Document Set Id 5303713, Version 1

Action Complete

<description>

NOTE

Note Id 5745009

Subject: Action Complete

Created: 21-Jun-2016 04:00 by Khalifeh, Philip

For: Document Set Id 5303713, Version 1

21.6.16- attended 99 Sargents and met with the owner- [REDACTED]. The entire property was inspected. It consists of two habitable dwellings. The first and original being over 100 years old. The second at least 35 years old. There are also approx. 4-5 stable blocks which were inspected and currently used to house horses. There is a third house which came under Council's notice in the 80's. This house was re sited on the premises and previous documents advise the owner to make it uninhabitable. This house was inspected and found to be dilapidated and damaged. Windows and smashed and external walls missing. This house is located amongst the heavy vegetated part of the land and is not being used. files 1397/85 and 1108/130 make mention of both habitable dwellings and both are depicted in plans submitted to council. There is no mention in the files that Council considers either to be illegal. NFA to be taken.

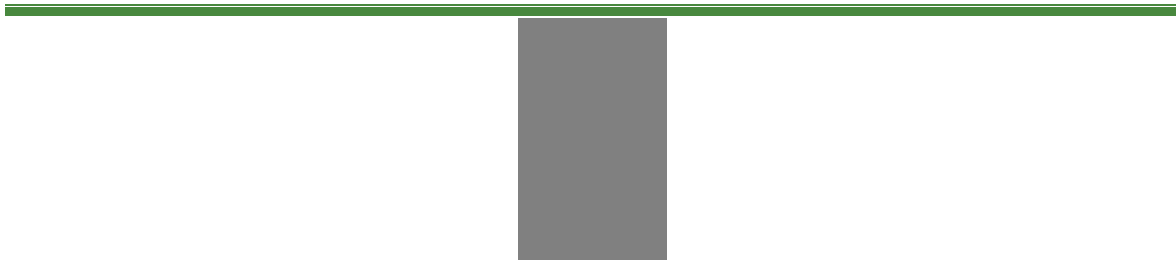
EIS Appendix 4: Preliminary Acid Sulfate Soil Assessment

**PRELIMINARY ACID SULFATE SOIL ASSESSMENT
FOR
HALA CONSTRUCTIONS PTY LTD**

Prepared for: Hala Almeddine,
Hala Constructions Pty Ltd

Prepared by: Damien Thomas, Graduate Environmental Scientist
R T Benbow, Principal Consultant

Report No: 181084_PASS_Rev3
June 2019
(Released: 20 June 2019)



Engineering a Sustainable Future for Our Environment

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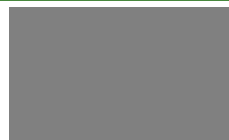


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Contents	Page
1. INTRODUCTION	1
1.1 Acid Sulfate Soil background	1
1.2 Objectives and Scope of Assessment	2
1.3 Planning Requirements	2
2. SITE DESCRIPTION	5
2.1 Subject Site Details	5
2.2 Site Geomorphology	5
2.3 Hydrology	5
2.4 Proposed Works	6
2.5 Acid Sulfate Soil Statement	8
3. CONCLUDING REMARKS	10
4. LIMITATIONS	11
5. REFERENCES	12

Tables	Page
Table 2-1: Site Details	5

Figures	Page
Figure 2-1: Site Regional Setting	6
Figure 2-2: Site Local Setting	7
Figure 2-3: Location of the Proposed Development Area	8
Figure 2-4: An Acid Sulfate Soil Map Showing Soil Classes	9





1. INTRODUCTION

Benbow Environmental was commissioned by Hala Construction Pty Ltd to undertake a preliminary assessment for Acid Sulfate Soils (ASS) for a proposal to establish a landscaping supply business and resource recovery facility. The development area is located within a two-hectare area of the property at 99 Sargents Road, Ebenezer (the “subject site”), within the local government area of Hawkesbury City Council.

This assessment is required as the subject site has been identified as containing Class 3 and Class 5 land in the Acid Sulfate Soil Map of *Hawkesbury Local Environmental Plan 2012* (LEP 2012). The proposed works involves cut and fill bulk earthworks to allow for the construction of a large shed for the screening, sorting, and crushing of construction and demolition (C&D) waste and Excavated Natural Materials (ENM & VENM), a site office, an outdoor storage/stockpiling area, a weighbridge, wash bay and car parking area.

The purpose of this preliminary assessment is to establish whether the proposed earthworks and construction of buildings, are likely to disturb any potential ASS on site. If any proposed works are found to present an environmental risk for a particular class of land, in which the subject site is identified, then further investigation is required to determine an actual presence of ASS and whether the level poses an environmental risk.

1.1 ACID SULFATE SOIL BACKGROUND

Acid Sulfate Soils (ASS) are naturally occurring soils and sediments that formed under waterlogged conditions. They contain iron sulfide (predominantly pyrite). When in a water logged, or anoxic environment, ASS remain benign. However, if drained, excavated or exposed to air by a lowering of the water table, sulfides react with oxygen to form sulfuric acid, sometimes in very large quantities (for every 1 tonne of completely oxidised sulfidic material, 1.6 tonnes of pure sulfuric acid is produced). Effects from disturbance are believed to last from hundreds to thousands of years. ASS contains traces of metals such as iron, aluminium and arsenic. Once acid forms, it mobilises any metals held within the soil. Rainfall washes this mixture into the surrounding environment, polluting land and nearby waterways. Accumulation of acids and metals becomes toxic to plants and animals, especially aquatic organisms. Built structures are highly susceptible to ASS, as acid will slowly destroy concrete, steel, roads and building foundations.

ASS can be divided into two categories:

- Actual Acid Sulfate Soils (AASS) - these contain highly acidic soil layers (sulfuric material) caused by aeration, or sulfidic material rich in iron sulfides. The sulfuric material is primarily composed of organic soil material, with a pH <4 and is usually identified by the occurrence of bright yellow jarosite mottles.
- Potential Acid Sulfate Soils (PASS) - these contain high levels of iron sulfides or sulfidic material that has not been exposed to air and oxidised. PASS can include waterlogged soils rich in pyrite, soft soils typically very dark, blue grey or dark greenish-grey coloured soils.

ASS occur predominantly on coastal lowlands, with elevations generally below 5 m Australian Height Datum (AHD), but also can occur within inland environments.



The presence of ASS generally indicates potential risks to surface and or groundwater quality, soil strength, stability, habitat character and agricultural productivity on adjoining lands, as well as presenting challenges for the design and maintenance of infrastructure in acid sulfate environments.

Another factor to consider is the costs involved with removal and disposal of ASS. If possible, best practice is to treat such soils in situ and reuse onsite. ASS can be successfully treated with lime to neutralise the effects of the acid. Removing ASS for offsite disposal is expensive; as such soils are treated as waste and must be sent to a licenced landfill facility.

1.2 OBJECTIVES AND SCOPE OF ASSESSMENT

The objective of this preliminary assessment is to address the regulatory requirements reported in Section 1.3 and to fulfil the Council requirement to undertake a preliminary ASS assessment. The Hawkesbury City Council advised that: *“The Acid Sulfate Soils Map of LEP 2012 identifies the subject site as containing Class 3 and Class 5 land. A preliminary assessment for the proposed works in accordance with the Acid Sulfate Soils Manual should be provided”*.

In line with Council requirements, the assessment is conducted in accordance with the *Acid Sulfate Soils Manual* published by the Acid Sulfate Soils Management Advisory Committee, NSW, in 1998. Part of the ASS Manual is the *Acid Sulfate Soils Assessment Guidelines* (the “Assessment Guidelines”), which outlines best practice in assessing the impacts of proposed works in areas likely to contain acid sulfate soils.

To achieve the abovementioned objectives, the assessment process is divided in two steps. The first step is to establish whether the proposal is likely to disturb any (potential) ASS onsite. If the proposed works are found to pose an environmental risk for those particular classes of land in which the subject site is identified, the assessment proceeds to the following step, to verify the presence or absence of ASS in the area subject to modifications. If present, to determine at what concentrations, so as to justify the preparation or not of an Acid Sulfate Soils Management plan.

1.3 PLANNING REQUIREMENTS

This section outlines the statutory planning control most relevant to the proposed constructions. Specific objectives and requirements for development with ASS concerns are set out under Clause 6.1 of the Hawkesbury LEP 2012, as follows:



6.1 Acid sulfate soils

- 1) *The objective of this clause is to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage.*
- 2) *Development consent is required for the carrying out of works described in the Table to this subclause on land shown on the Acid Sulfate Soils Map as being of the class specified for those works.*

Class of land	Works
1	Any works.
2	Works below the natural ground surface. Works by which the watertable is likely to be lowered.
3	Works more than 1 metre below the natural ground surface. Works by which the watertable is likely to be lowered more than 1 metre below the natural ground surface.
4	Works more than 2 metres below the natural ground surface. Works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface.
5	Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.
3)	<i>Development consent must not be granted under this clause for the carrying out of works unless an acid sulfate soils management plan has been prepared for the proposed works in accordance with the Acid Sulfate Soils Manual and has been provided to the consent authority.</i>
4)	<i>Despite subclause (2), development consent is not required under this clause for the carrying out of works if:</i> a) <i>a preliminary assessment of the proposed works prepared in accordance with the Acid Sulfate Soils Manual indicates that an acid sulfate soils management plan is not required for the works, and</i> b) <i>the preliminary assessment has been provided to the consent authority and the consent authority has confirmed the assessment by notice in writing to the person proposing to carry out the works.</i>
5)	<i>Despite subclause (2), development consent is not required under this clause for the carrying out of any of the following works by a public authority (including ancillary work such as excavation, construction of access ways or the supply of power):</i> a) <i>emergency work, being the repair or replacement of the works of the public authority required to be carried out urgently because the works have been damaged, have ceased to function or pose a risk to the environment or to public health and safety;</i> b) <i>routine maintenance work, being the periodic inspection, cleaning, repair or replacement of the works of the public authority (other than work that involves the disturbance of more than 1 tonne of soil); and</i>



- c) minor work, being work that costs less than \$20,000 (other than drainage work).*
- 6) Despite subclause (2), development consent is not required under this clause to carry out any works if:*
 - a) the works involve the disturbance of less than 1 tonne of soil, such as occurs in carrying out agriculture, the construction or maintenance of drains, extractive industries, dredging, the construction of artificial water bodies (including canals, dams and detention basins), foundations or flood mitigation works; or*
 - b) the works are not likely to lower the watertable.*

In particular it should be noted that, as addressed under clause 6.1 (2): development consent is required for carrying out the stated work/s on land (classes 3 and 5 in table above), as identified in the *Hawkesbury LEP ASS Map*. However, as indicated under clause 6.1 (4a), development consent is not required when a preliminary assessment of the proposed works (prepared in accordance with the Acid Sulfate Soils Manual), indicates that an Acid Sulfate Soils Management Plan is not required for the works.



2. SITE DESCRIPTION

2.1 SUBJECT SITE DETAILS

The land is located at 99 Sargents Road, Ebenezer, 2756, within the Local Government Area (LGA) of Hawkesbury City Council. The following table lists relevant site identification details.

Table 2-1: Site Details

Address	99 Sargents Road, Ebenezer, 2756
Lot and DP Numbers	Lot 288 DP751665
Local Government Area	Hawkesbury City Council
Current Land Zoning	RU1 – Primary Production

Source: <https://www.planningportal.nsw.gov.au/>

The site's regional setting is shown in Figure 2-1, while Figure 2-2 shows its local setting. The development area is located in an eastern section of the site. (see Figure 2-3).

2.2 SITE GEOMORPHOLOGY

The 'Penrith 1:100,000 Geological Map Sheet 9030' describes the geological composition of the area as follows:

'Qph: clay, clayey sand, silt.'

The soil map 'Soil Landscape of Penrith 1:100,000 Sheet 9030' shows that the subject site is located in an area classified as 'Woodlands', which is described as follows:

'Landscape – very broad benches and drainage lines in the passage beds of the Mittagong Formation (alternating bands of shale and fine-grained sandstones). Rock outcrop is minimal. Local relief up to 20 m. Slope <10%.

Soils – deep (150-300 cm) soils range from leached sands (Uc2.21) in the drainage lines to Lithosols (Uc1) on sideslopes, with Red Solodic Soils (Dr4.62), Xanthozems (Gn3.51) and Yellow Earths (Gn2.24) on benches.

Limitations – stony soil, low soil fertility, low available water holding capacity.'

2.3 HYDROLOGY

The Upper Hawkesbury River flows from Yarramundi, south of Penrith, where its tidal limit is reached and where the Nepean River "ends", at the confluence with the Grose River. In the area between Windsor to Sackville, the river is wide and deep, with low flat banks and is cleared of most riparian vegetation. The Upper Hawkesbury River is a tide dominated, drowned valley estuary. At the end of the last Glacial Maxima (Ice Age), sea-levels rose, flooding steep river valleys along Australia's eastern coastal regions. It is these flooded regions where saline and brackish lowlands, such as tidal flats, salt marshes and mangrove swamps, are the dominant areas where pyrite forms. The sea water provided dissolved sulfate to the now waterlogged,



saline sediments. Along with the breakdown of organic material by bacteria in anaerobic conditions and iron, all combine to form pyrite. Pyrite formation of concern is of predominately Holocene origin (of the last 10,000 years).

2.4 PROPOSED WORKS

The proposed works involves establishing a platform for a resource recovery facility and construction of associated infrastructure.

Figure 2-1: Site Regional Setting



The development area slopes downwards from west to east, from an approximate height of 30 m AHD to approximately 20 m AHD. The area measures approximately 100 m in length, and 100 m in width. The proposal involves cut and fill works earthworks to and if required, VENM sourced



offsite to allow for the construction of a building and associated infrastructure. The external area would be capped with compacted road-base material to create a platform that would house the proposed storage area of screened and crushed VENM and ENM, and construction and demolition waste material, as per the business proposal.

Figure 2-2: Site Local Setting





Figure 2-3: Location of the Proposed Development Area



2.5 ACID SULFATE SOIL STATEMENT

The parcel of land, described as Lot 71, DP 751665, contains Class 3 and Class 5 land, as described in the *Acid Sulfate Soil Map of the Hawkesbury LEP 2012* (see Figure 2-4). Work undertaken in these areas could present an environmental risk in their respective classes.

Class 3

*Works by which the watertable is likely to be lowered; and
Works beyond 1 metre below the natural ground surface.*

Class 5

Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.



Environmental risk associated with disturbing ASS is dependent on the type of land activity and where in the landscape the work is performed. Acid sulfate soils are not expected to occur in environments above 10 m AHD (class 5 land). The actual area where work is proposed, lays only on class 5 land; thus, due to site relief (of approximately 27 – 20 m AHD), and that the proposal does not require digging beyond 2.0 metres in depth from the surface layer, it is highly unlikely that the works will encounter ASS.

Therefore the proposal complies with the objective of clause 6.1 (1) not to

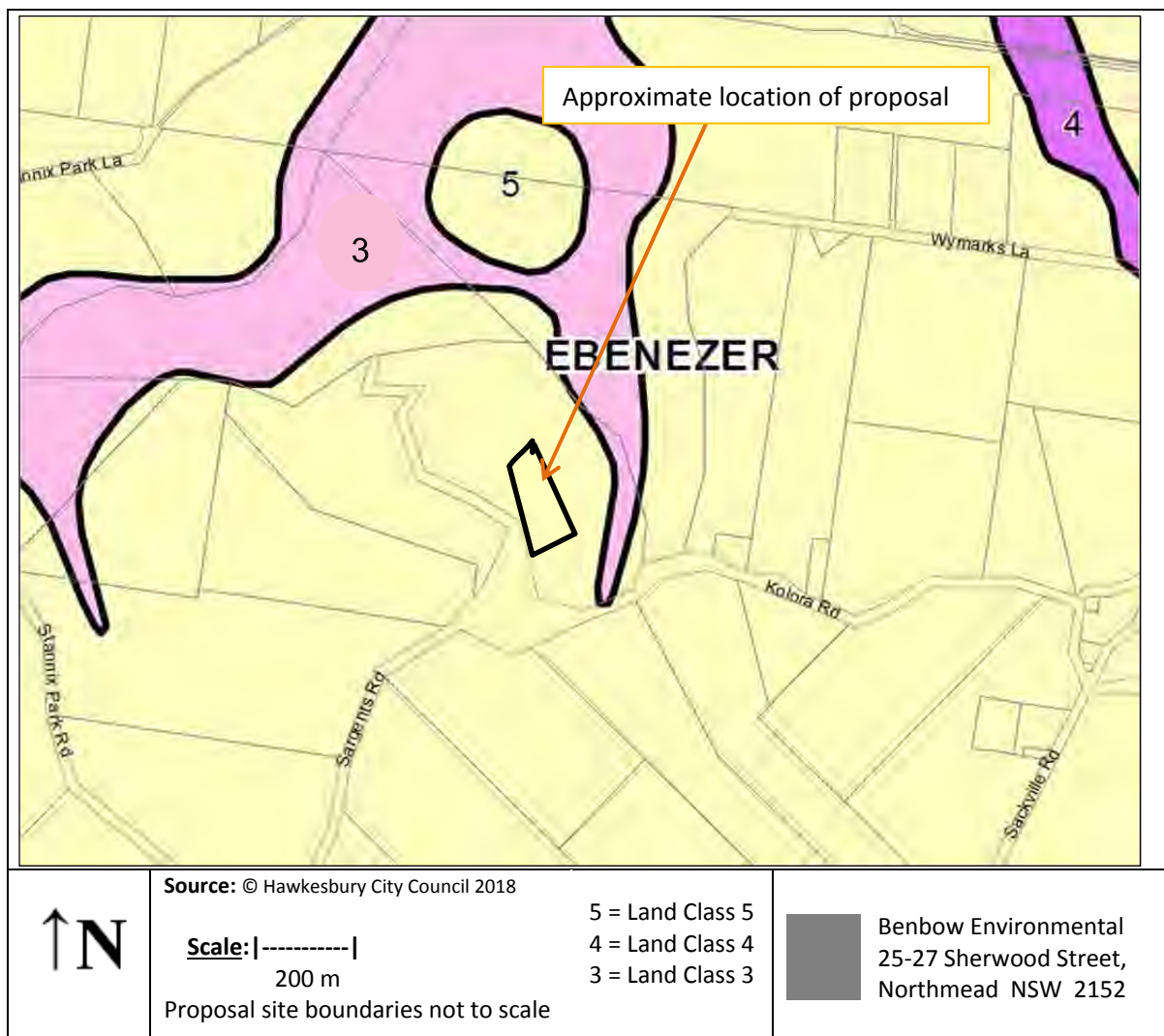
“... disturb, expose or drain acid sulfate soils and cause environmental damage”

and

Clause 6 (6) Despite subclause (2), development consent is not required under this clause to carry out any works if: (b) the works are not likely to lower the watertable.

As the proposed works would occur well above the 5 metres AHD requirement, and will not lower the watertable, an *Acid Sulfate Soil Management Plan* would not be required.

Figure 2-4: An Acid Sulfate Soil Map Showing Soil Classes





3. CONCLUDING REMARKS

Benbow Environmental was engaged to undertake a preliminary acid sulfate soils assessment for Hala Constructions Pty Ltd. The proposed works involves bulk earthworks cut and fill involving some imported VENM sourced offsite with soil excavation of approximately 3.5 m in depth. The proposed works will occur at 20 – 27 m AHD which is well above the 5 metres AHD requirement.

An Acid Sulfate Soil Management Plan is not required.

This concludes the report.



Damien Thomas
Graduate Environmental Scientist

R T Benbow
Principal Consultant



4. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Hala Constructions Pty Ltd, as per our agreement for providing environmental services. Only Hala Constructions Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Hala Constructions Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.



5. REFERENCES

Hawkesbury Local Environmental Plan 2012 - NSW Legislation [Online]

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EIS Appendix 5: Traffic and Parking Impact Assessment

TRAFFIC AND PARKING IMPACT ASSESSMENT OF A PROPOSED LANDSCAPING BUSINESS

99 Sargents Road in Ebenezer

Traffic and Parking Impact Report

Prepared for: Benbow Environmental

A1815935A (Version 1d)

June 2019

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1. INTRODUCTION

ML Traffic Engineers was commissioned by Benbow Environmental to undertake a traffic and parking impact assessment of a proposed landscaping material supplies and resource recovery facility development at 99 Sargents Road in Ebenezer.

The vehicle access and egress to the car park is via Sargents Road. Truck access to and egress from the weighbridge is via a separate driveway leading to Sargents Road. The development site is currently vacant; however, the north section of the lot is currently being used as part of an equestrian centre.

This traffic report focuses on the proposed development and changes in car usage and car park utilisation and additional trips from the proposed development.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed landscaping material supplies and resource recovery facility development is located to the West of Ebenezer Public School and is in the area which is primarily rural area and vacant lands with some horticulture, dairy and local business.

Figures 1 and 2 shows the location of the development site from the aerial and street map perspective respectively.

Figures 3 shows a photograph of the existing site.



Figure 1: Location of the Subject Site on Aerial



Figure 2: Street Map of the Location of the Development Site



Figure 3: Development Site at 99 Sargents Road in Ebenezer

2.2 Road Network

This section describes the roads near the proposed development.

Sargents Road is an unsealed rural road ending in a cul-de-sac with one lane each way and a default speed limit of 50km/hr. The road has a shoulder. Council generally does not permit on street parking on the road shoulder except for emergency parking (car broken down etc). On street parking is not permitted on either side of the road. Figure 4 shows a photograph of Sargents Road.

Stannix Park Road is a rural road with one lane each way and a sign posted speed limit of 60km/hr. On street parking not permitted on either side of the road. Figure 5 shows a photograph of Stannix Park Road.

Sackville Road is major collector road with one lane each way and a sign posted speed limit of 80km/hr. The road has a shoulder. Council generally does not permit on street parking on the road shoulder except for emergency parking (car broken down etc). Figure 6 shows a photograph of Sackville Road.

Lockhart Road is a rural road with one lane each way and a default speed limit of 50km/hr. The road has a shoulder. Council generally does not permit on street parking on the road shoulder except for emergency parking (car broken down etc). Figure 7 shows a photograph of Lockhart Road.

Ebenezer Wharf Road is a rural road with one lane each way and a sign posted speed limit of 60km/hr. On street parking is not permitted on either side of the road. Figure 8 shows a photograph of Ebenezer Wharf Road.



Figure 4: Sargents Road facing North East



Figure 5: Stannix Park Road facing North West



Figure 6: Sackville Road facing South West



Figure 7: Lockhart Road facing West



Figure 8: Ebenezer Wharf Road facing South East

2.3 Public Parking Opportunities

The development site is located in a primary production zone RU1. There are no on street parking opportunities near the site. All parking demands must be contained on site.

2.4 Intersection Description

As part of this traffic impact assessment three intersections are assessed:

- Priority intersection of Stannix Park Road with Sargents Road
- Priority intersection of Sackville Road with Stannix Park Road
- Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road

External traffic travelling to and from the site will most likely need to travel through the above intersections.

The priority intersection of Stannix Park Road with Sargents Road is a four-leg intersection with all turn movements permitted. Drivers on Sargents Road must yield to the traffic on Stannix Park Road. Figure 9 shows a layout of the intersection using SIDRA – an industry standard intersection assessment software.



The priority intersection of Sackville Road with Stannix Park Road is a three-leg intersection with all turn movements permitted. Drivers on Stannix Park Road must yield to the traffic on Sackville Road. Figure 10 shows a layout of the intersection using SIDRA.

The priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road is a four-leg intersection with all turn movements permitted. Drivers on Ebenezer Wharf Road and Lockhart Road must yield to the traffic on Sackville Road. Figure 11 shows a layout of the intersection using SIDRA.

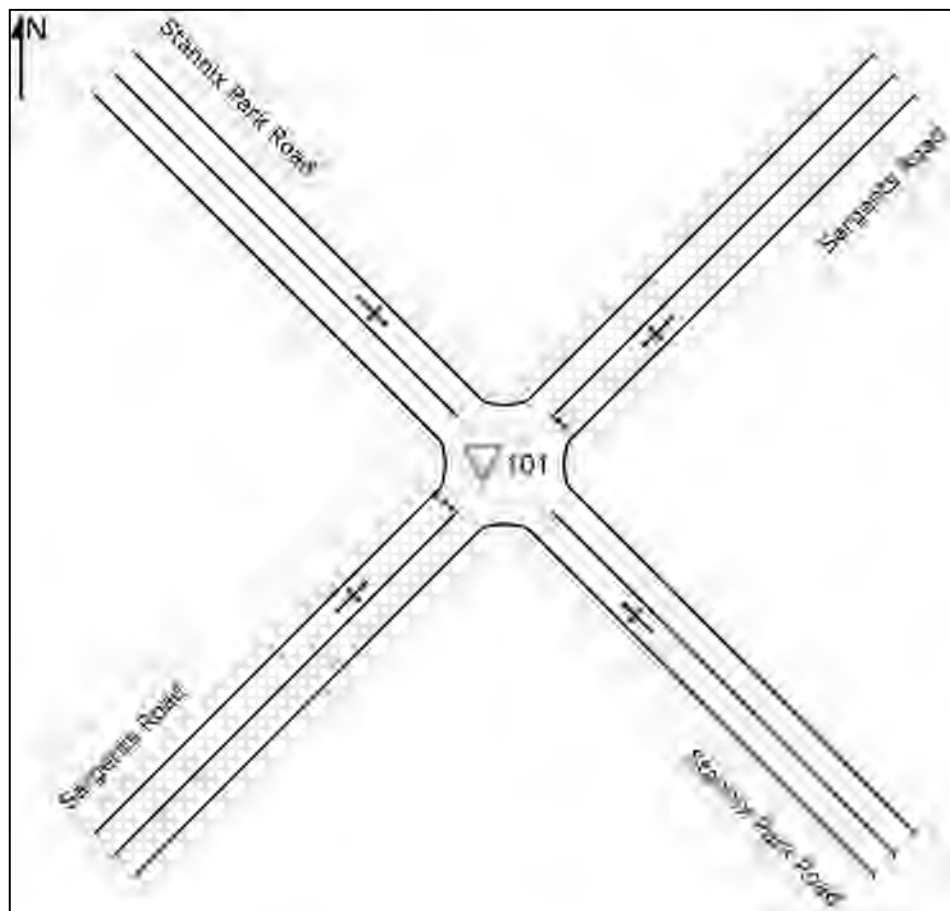


Figure 9: Priority intersection of Stannix Park Road with Sargents Road (SIDRA)

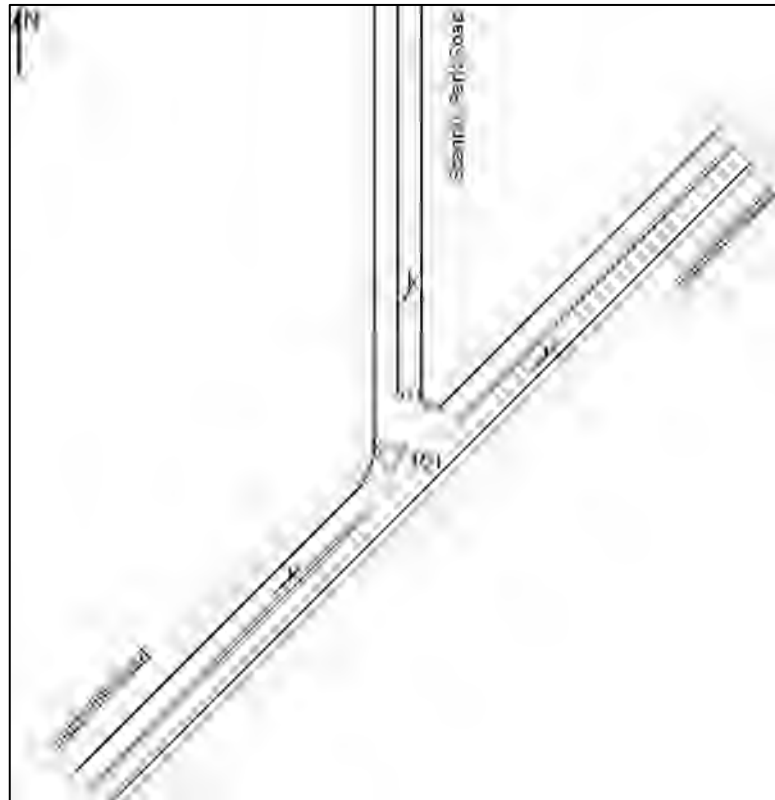


Figure 10: Priority intersection of Sackville Road with Stannix Park Road (SIDRA)

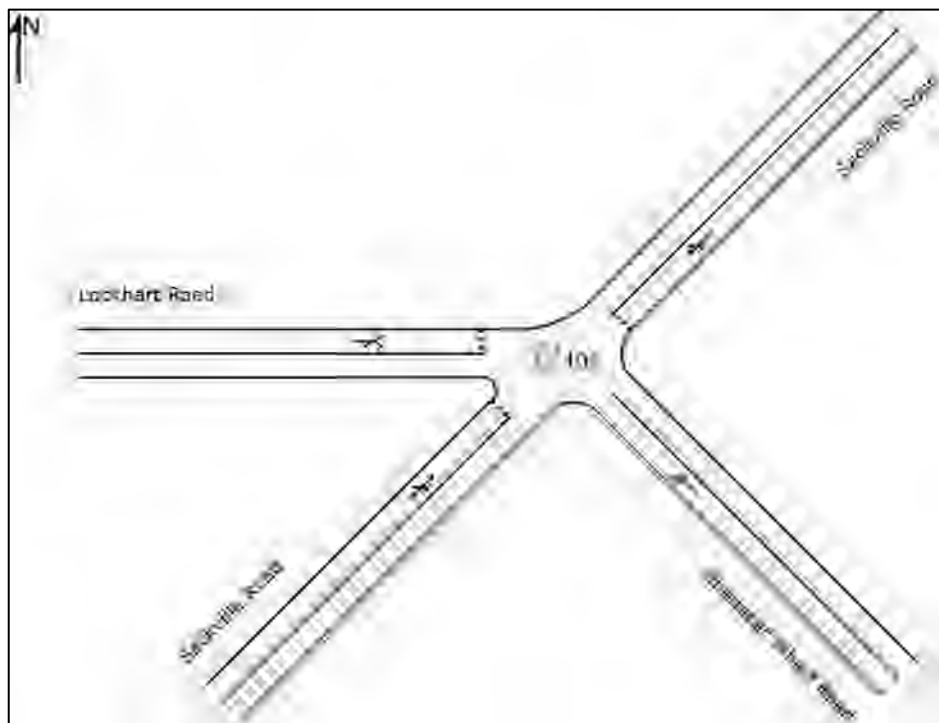


Figure 11: Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road (SIDRA)



2.5 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the intersection for the weekday AM and PM peak hour periods. The peak hours are 8:00am to 9:00am and 5:00pm to 6:00pm for the weekday AM and PM peak hours respectively.

Figures 12 and 13 presents in vehicle numbers the existing weekday AM and PM peak hour traffic volumes respectively. Numbers in brackets denote heavy vehicles.

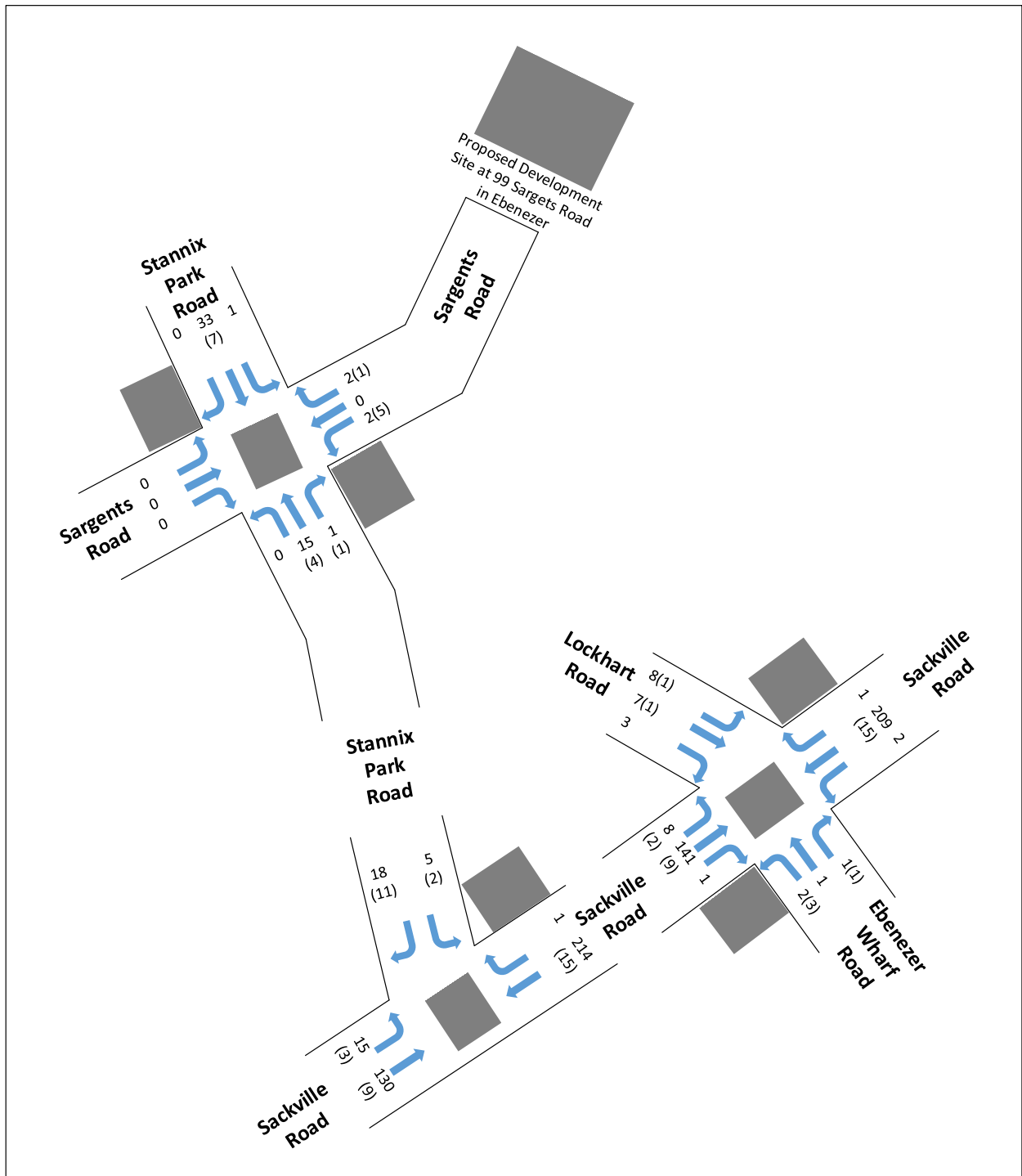


Figure 12: Existing Weekday Traffic Volumes AM Peak Hour

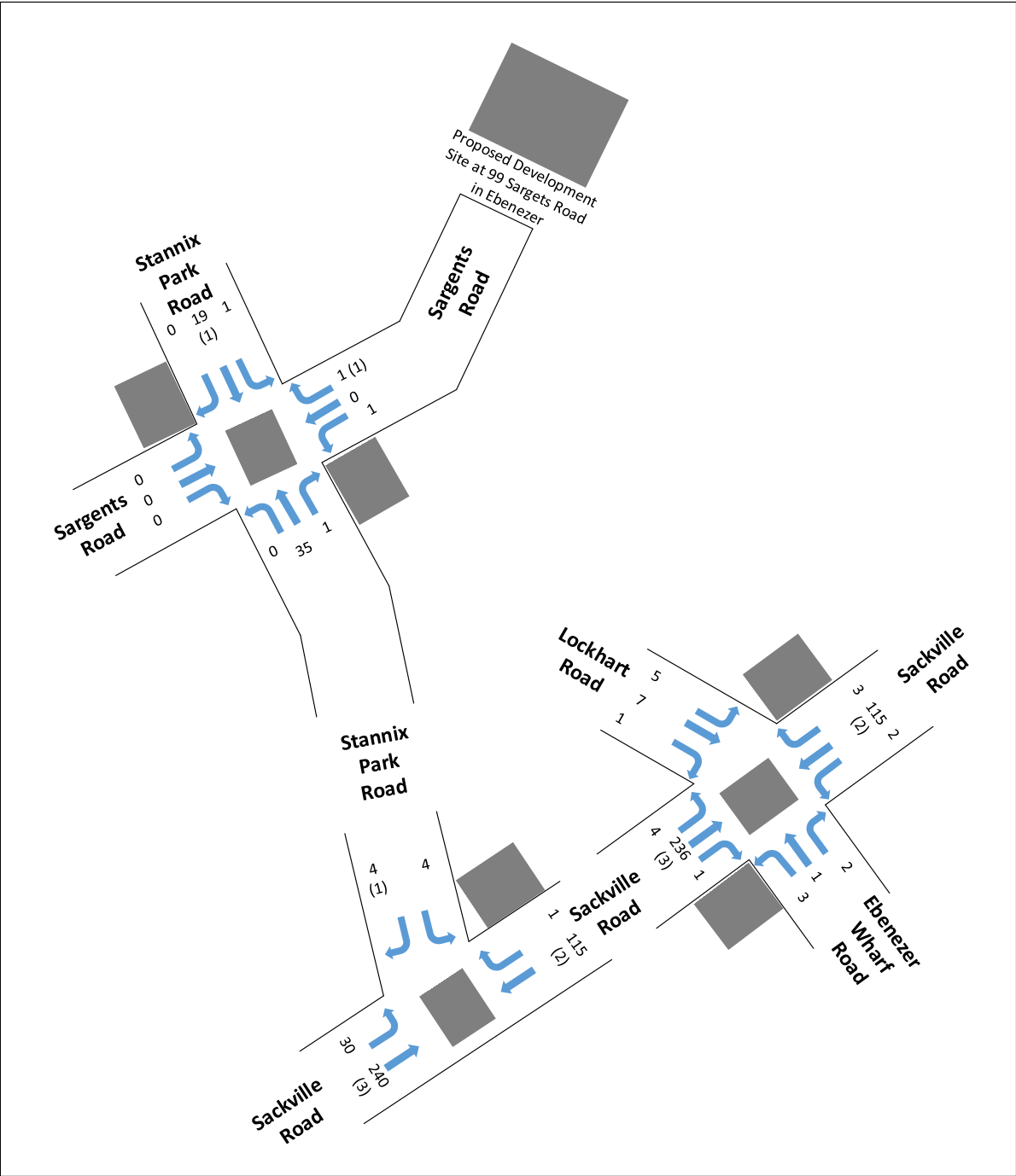


Figure 13: Existing Weekday Traffic Volumes PM Peak Hour

2.6

Intersection Assessment

An intersection assessment has been undertaken for:

- Priority intersection of Stannix Park Road with Sargents Road
- Priority intersection of Sackville Road with Stannix Park Road
- Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road

The existing intersection operating performance was assessed using the SIDRA software package (version 8) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
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 & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's 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). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.



LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The result of the intersection analysis is as follows:

Priority intersection of Stannix Park Road with Sargents Road

- All turn movements have LoS A for both AM and PM peak hours
- There is spare capacity at this intersection

Priority intersection of Sackville Road with Stannix Park Road

- All turn movements have LoS A for both AM and PM peak hours
- There is spare capacity at this intersection

Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road

- All turn movements have LoS A for both AM and PM peak hours
- There is spare capacity at this intersection

The full SIDRA results are presented in Appendix A.

2.7 Public Transport

There are no public transport services within walking distance to the proposed landscaping business.



2.8 Conclusions on the Existing Conditions

There are no public parking opportunities near the development, all parking demand must be contained on site.

The nearby intersection performs well to accommodate additional traffic of the development site.

There are no public transport services within walking distance to the development.



3. PROPOSED LANDSCAPING MATERIAL SUPPLIES PREMISES DEVELOPMENT

The proposed landscaping material supplies premises has the following land uses:

- Production building with eight material bunkers and a Gross Floor Area (GFA) of 2041 m²
- An office with a GFA of 131 m²
- *A total industrial area of 2172 m²*
- Eight stock piles with a combined area of 572 m²
- A weighbridge
- A wash bay

Car parking is provided on the ground level with vehicle access and egress via Sargents Road.

The ground level car park has details as follows:

- Twenty-six general car spaces plus;
- One disabled car space
- *A total of 27 car spaces*

A full scaled plan of the proposed development is provided as part of the Development Application. Scaled measurements should use these plans.

4. CAR PARKING CONSIDERATIONS

4.1 City of Hawkesbury Planning Scheme

The car parking requirements for industry developments are presented in *Hawkesbury Council Development Control Plan* with the car parking rates as follows as it applies to the proposed development:

Industry, Factory, Warehouse, Bulk Stores:

- 4 spaces for all development up to 300m² of GFA, then 1 space for each 90m² of GFA or part thereof, in excess of 300m²

Table 3 summarises the car parking requirements for the proposed development.

Land Use	Total GFA (m ²)	GFA (m ²)	Car Parking Rate per GFA (m ²)	Car Spaces Required	Car Spaces Provided
Landscaping Material Supplies	2172	300	4	4	27
		1872	0.011	20.8	
Total				25	27

Table 3: Summary of Car Parking Requirements and Provisions

4.2 Adequacy of Car Parking Provision

The proposed landscaping material supplies and resource recovery facility development provides 27 car spaces versus 25 spaces required. The proposed development complies with Council's Development Control Plan car parking requirements.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Truck Traffic Generation

The NSW RTA Guide to Traffic Generating Development Documents does not publish truck trip generation rates for landscaping material supplies premises.

Traffic generation for the proposed development has been determined based on the annual tonnage of 20,000 tonnes per year and operation of the site 6 days per week. Material would be transported in trucks ranging from 23 to 48 tonnes in size.

The following calculations are provided:

23 tonne trucks

Average loads and truck movements using 23 tonne trucks for all loads.

Incoming Materials:	20,000/23 =	869.6	Trucks p/a
Outgoing Materials:	20,000/23 =	869.6	Trucks p/a
Totals		1,739.2	Trucks p/a

48 tonne trucks

Average loads and truck movements using 48 tonne trucks for all loads.

Incoming Materials:	20,000/48 =	416.7	Trucks p/a
Outgoing Materials:	20,000/48 =	416.7	Trucks p/a
Totals		833.4	Trucks p/a

Average annual truck trips

Using 23 tonne trucks:	1,739.2 trucks per year / 312 =	5.57 trucks per day
Using 48 tonne trucks:	833.4 trucks per year / 312 =	2.67 trucks per day
Average:	(5.57+2.67)/2 =	4.12 trucks per day

Based on the use of 23 to 48 tonne trucks, the number of truck movements expected would be between 3 and 6 truck trips per day, which will produce between 2-3 movements in and 2-3 movements out per day over an 11 hour period. On average, this means the proposed development will generate 4-5 truck trips per day, which equates to less than 1 truck movement every 2 hours.

5.2 Car Traffic Generation

The NSW RTA Guide to Traffic Generating Development 2002 does not publish car trip generation rates for landscaping material supplies premises.

As a result, an empirical study has been undertaken for a similar landscaping site in Sydney and the following trip rates were observed:

- 2 trips per bunker for the weekday AM and PM peak hours

The NSW RTA Guide to Traffic Generating Developments 2002 publishes trip generation rates for offices as follows:

- 2 trips per 100 m² of Gross Floor Area in the weekday peak hours

Table 4 summarises the trip generations for the respective land uses during the peak hours.

Peak Hour	Land Use	Number of Bunkers	Trip Generation Rate per Bunker	Trips Generated
AM	Landscaping Material Supplies Component	8	2	16
PM			2	16
Peak Hour	Land Use	GFA (m ²)	Trip Generation Rate per GFA (m ²)	Trips Generated
AM	Office	131	0.02	3
PM			0.02	3

Table 4: Trip Generations in the Weekday Peak Hours

The total car trips can be obtained as the sum of the two land use components. Table 5 presents the net trip generations and distributions. The generated trips in the peak hours are modest.

Land Use	Peak Hour	Origin	Destination	Total
Landscaping Material Supplies Component	AM	8	8	16
	PM	8	8	16
Office	AM	0	3	3
	PM	3	0	3
Total Car Trips	AM	8	11	19
	PM	11	8	19

Table 5: Net Trip Generations and Distributions in the Weekday Peak Hours

5.3 Traffic Volumes

The additional development trips are assigned onto the local traffic network. The following figures present the existing with the development trips (in red for origin trips and blue for destination trips) for the weekday AM and PM peak hours.

The additional development trips represent a small proportion of the existing traffic volumes.

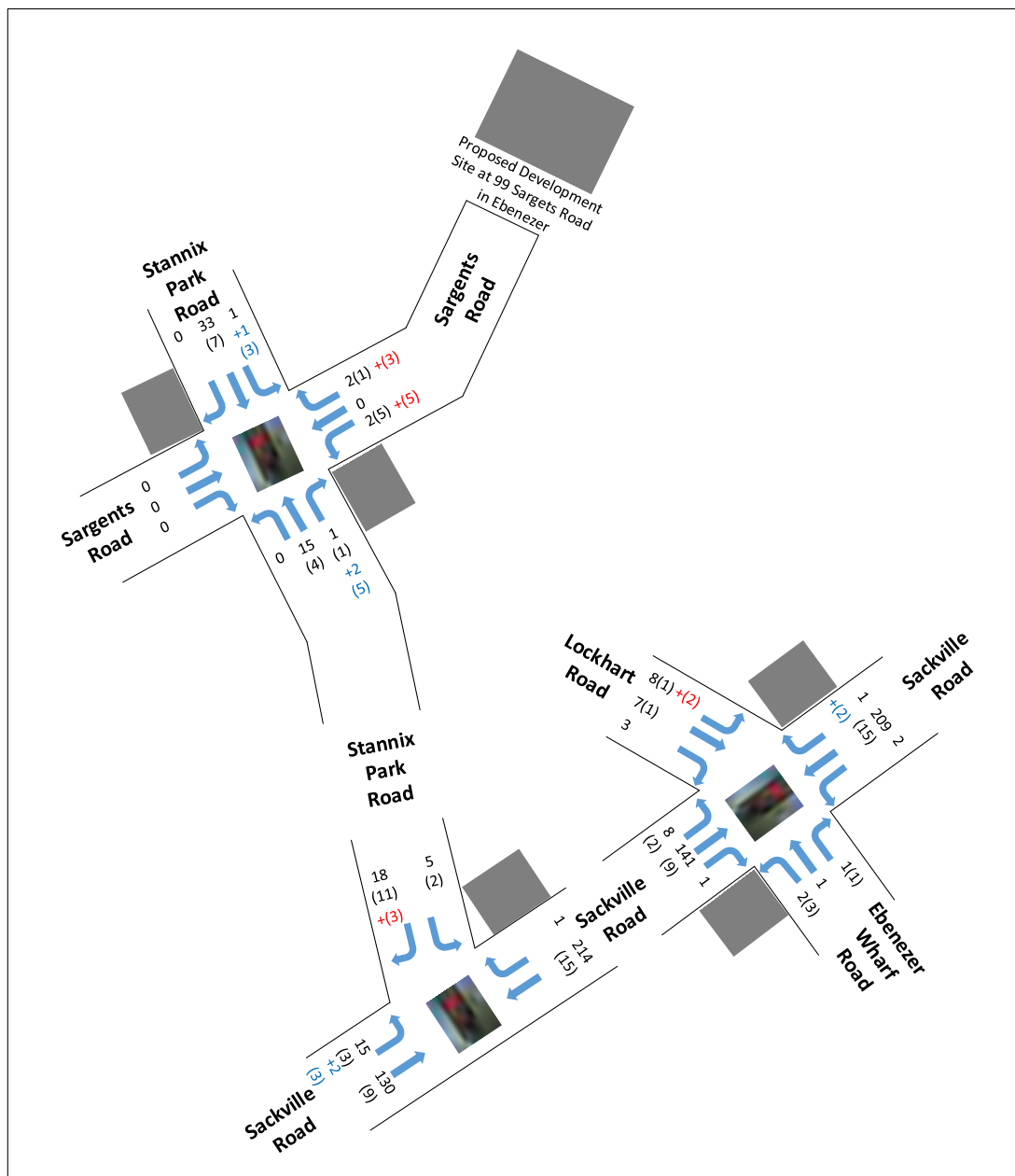




Figure 10: Weekday AM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

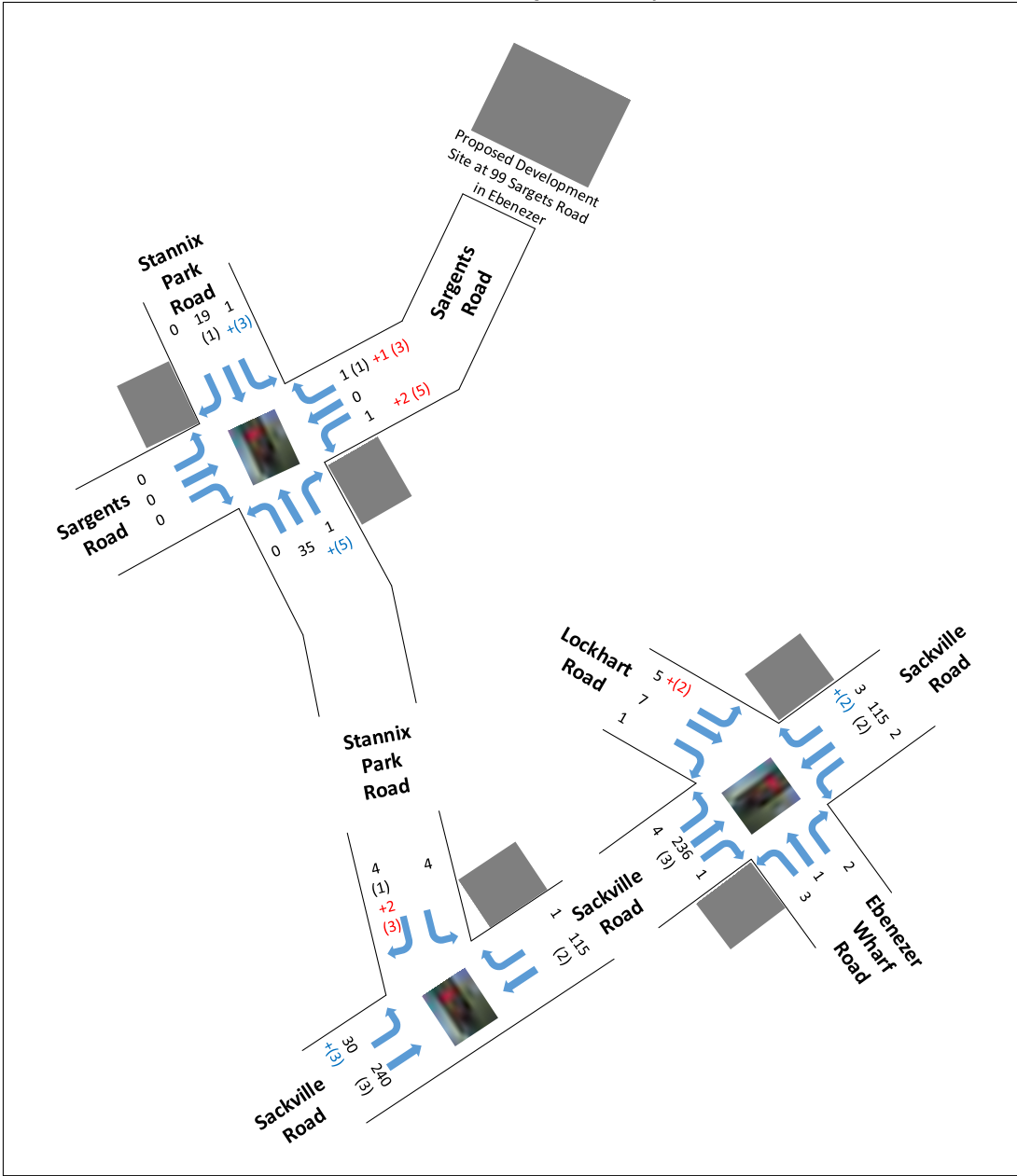


Figure 11: Weekday PM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

5.4 Intersection Assessment

An intersection assessment has been undertaken for the three nearby intersections.

The results of the intersection analysis are as follows for the AM and PM peak hours:



Priority intersection of Stannix Park Road with Sargents Road

- All turn movements have LoS A for both AM and PM peak hours
- The additional trips do not change the LoS of any turn movements or the overall intersection

Priority intersection of Sackville Road with Stannix Park Road

- All turn movements have LoS A for both AM and PM peak hours
- The additional trips do not change the LoS of any turn movements or the overall intersection

Priority intersection of Sackville Road with Ebenezer Wharf Road and Lockhart Road

- All turn movements have LoS A for both AM and PM peak hours
- The additional trips do not change the LoS of any turn movements or the overall intersection

The full SIDRA results with the development traffic are presented in Appendix B. The existing conditions are presented in Appendix A.



6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

- The proposed development complies with Council's car parking requirements.

Traffic

- The proposed development is a modest trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed development can be accommodated at the nearby intersections and road network without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning consent for the proposed landscaping material supplies and resource recovery facility development at 99 Sargents Road in Ebenezer, should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Stannix Park Road												
1	L2	1	0.0	0.014	5.7	LOS A	0.0	0.2	0.04	0.08	0.04	57.6
2	T1	20	21.1	0.014	0.0	LOS A	0.0	0.2	0.04	0.08	0.04	59.2
3	R2	2	50.0	0.014	6.2	LOS A	0.0	0.2	0.04	0.08	0.04	54.5
Approach		23	22.7	0.014	0.8	NA	0.0	0.2	0.04	0.08	0.04	58.7
NorthEast: Sargents Road												
4	L2	7	71.4	0.011	6.6	LOS A	0.0	0.4	0.14	0.54	0.14	50.5
5	T1	1	0.0	0.011	4.4	LOS A	0.0	0.4	0.14	0.54	0.14	53.6
6	R2	3	33.3	0.011	6.3	LOS A	0.0	0.4	0.14	0.54	0.14	51.4
Approach		12	54.5	0.011	6.3	LOS A	0.0	0.4	0.14	0.54	0.14	51.0
NorthWest: Stannix Park Road												
7	L2	1	0.0	0.025	5.6	LOS A	0.0	0.1	0.01	0.03	0.01	58.0
8	T1	42	17.5	0.025	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	59.7
9	R2	1	0.0	0.025	5.5	LOS A	0.0	0.1	0.01	0.03	0.01	57.4
Approach		44	16.7	0.025	0.3	NA	0.0	0.1	0.01	0.03	0.01	59.6
SouthWest: Sargents Road												
10	L2	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.10	0.54	0.10	53.7
11	T1	1	0.0	0.003	4.4	LOS A	0.0	0.1	0.10	0.54	0.10	53.9
12	R2	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.10	0.54	0.10	53.2
Approach		3	0.0	0.003	5.2	LOS A	0.0	0.1	0.10	0.54	0.10	53.6
All Vehicles		82	23.1	0.025	1.5	NA	0.0	0.4	0.04	0.13	0.04	57.7

Table A1: Priority Intersection Performance of Stannix Park Road with Sargents Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Sackville Road												
25	T1	241	6.6	0.130	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
26b	R3	1	0.0	0.130	6.6	LOS A	0.0	0.1	0.00	0.00	0.00	57.6
Approach		242	6.5	0.130	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
North: Stannix Park Road												
7b	L3	7	28.6	0.050	7.4	LOS A	0.2	1.5	0.37	0.64	0.37	51.4
9a	R1	31	37.9	0.050	7.8	LOS A	0.2	1.5	0.37	0.64	0.37	50.4
Approach		38	36.1	0.050	7.7	LOS A	0.2	1.5	0.37	0.64	0.37	50.6
SouthWest: Sackville Road												
30a	L1	19	16.7	0.089	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	56.4
31	T1	146	6.5	0.089	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		165	7.6	0.089	0.6	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		445	9.5	0.130	0.9	NA	0.2	1.5	0.03	0.08	0.03	58.7

Table A2: Priority Intersection Performance of Sackville Road with Stannix Park Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebenezer Wharf Road												
4	L2	5	60.0	0.006	6.2	LOS A	0.0	0.0	0.00	0.57	0.00	51.3
21a	L1	1	0.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.57	0.00	53.9
6	R2	2	50.0	0.006	6.1	LOS A	0.0	0.0	0.00	0.57	0.00	51.1
Approach		8	50.0	0.006	6.0	NA	0.0	0.0	0.00	0.57	0.00	51.6
NorthEast: Sackville Road												
7	L2	2	0.0	0.167	5.5	LOS A	0.7	5.0	0.07	0.51	0.07	54.5
8	T1	236	6.7	0.167	4.3	LOS A	0.7	5.0	0.07	0.51	0.07	54.4
26a	R1	1	0.0	0.167	5.5	LOS A	0.7	5.0	0.07	0.51	0.07	54.5
Approach		239	6.6	0.167	4.3	LOS A	0.7	5.0	0.07	0.51	0.07	54.4
West: Lockhart Road												
10a	L1	9	11.1	0.022	6.0	LOS A	0.1	0.6	0.31	0.59	0.31	51.9
12a	R1	8	12.5	0.022	6.7	LOS A	0.1	0.6	0.31	0.59	0.31	52.4
12b	R3	3	0.0	0.022	7.8	LOS A	0.1	0.6	0.31	0.59	0.31	52.3
Approach		21	10.0	0.022	6.5	LOS A	0.1	0.6	0.31	0.59	0.31	52.2
SouthWest: Sackville Road												
30b	L3	11	20.0	0.117	6.7	LOS A	0.5	3.4	0.03	0.53	0.03	54.0
2	T1	158	6.0	0.117	4.2	LOS A	0.5	3.4	0.03	0.53	0.03	54.5
3	R2	1	0.0	0.117	6.6	LOS A	0.5	3.4	0.03	0.53	0.03	54.0
Approach		169	6.8	0.117	4.4	LOS A	0.5	3.4	0.03	0.53	0.03	54.4
All Vehicles		438	7.7	0.167	4.5	NA	0.7	5.0	0.06	0.52	0.06	54.3

Table A3: Priority Intersection Performance of Sackville Road with Ebenezer Wharf Road and Lockhart Road Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Stannix Park Road												
1	L2	1	0.0	0.020	5.6	LOS A	0.0	0.1	0.01	0.03	0.01	58.1
2	T1	37	0.0	0.020	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	59.7
3	R2	1	0.0	0.020	5.5	LOS A	0.0	0.1	0.01	0.03	0.01	57.4
Approach		39	0.0	0.020	0.3	NA	0.0	0.1	0.01	0.03	0.01	59.6
NorthEast: Sargents Road												
4	L2	1	0.0	0.004	5.6	LOS A	0.0	0.1	0.11	0.54	0.11	53.7
5	T1	1	0.0	0.004	4.3	LOS A	0.0	0.1	0.11	0.54	0.11	53.8
6	R2	2	50.0	0.004	6.4	LOS A	0.0	0.1	0.11	0.54	0.11	51.0
Approach		4	25.0	0.004	5.7	LOS A	0.0	0.1	0.11	0.54	0.11	52.3
NorthWest: Stannix Park Road												
7	L2	1	0.0	0.012	5.6	LOS A	0.0	0.1	0.01	0.05	0.01	57.8
8	T1	21	5.0	0.012	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	59.4
9	R2	1	0.0	0.012	5.5	LOS A	0.0	0.1	0.01	0.05	0.01	57.2
Approach		23	4.5	0.012	0.5	NA	0.0	0.1	0.01	0.05	0.01	59.2
SouthWest: Sargents Road												
10	L2	1	0.0	0.002	5.6	LOS A	0.0	0.1	0.12	0.53	0.12	53.6
11	T1	1	0.0	0.002	4.3	LOS A	0.0	0.1	0.12	0.53	0.12	53.8
12	R2	1	0.0	0.002	5.7	LOS A	0.0	0.1	0.12	0.53	0.12	53.1
Approach		3	0.0	0.002	5.2	LOS A	0.0	0.1	0.12	0.53	0.12	53.5
All Vehicles		69	3.0	0.020	0.9	NA	0.0	0.1	0.02	0.09	0.02	58.7

Table A4: Priority Intersection Performance of Stannix Park Road with Sargents Road Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Sackville Road												
25	T1	123	1.7	0.065	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
26b	R3	1	0.0	0.065	7.0	LOS A	0.0	0.1	0.01	0.01	0.01	57.5
Approach		124	1.7	0.065	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
North: Stannix Park Road												
7b	L3	4	0.0	0.010	7.2	LOS A	0.0	0.3	0.36	0.59	0.36	52.8
9a	R1	5	20.0	0.010	7.0	LOS A	0.0	0.3	0.36	0.59	0.36	51.3
Approach		9	11.1	0.010	7.1	LOS A	0.0	0.3	0.36	0.59	0.36	51.9
SouthWest: Sackville Road												
30a	L1	32	0.0	0.149	5.3	LOS A	0.0	0.0	0.00	0.07	0.00	57.2
31	T1	256	1.2	0.149	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		287	1.1	0.149	0.6	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		421	1.5	0.149	0.6	NA	0.0	0.3	0.01	0.06	0.01	59.2

Table A5: Priority Intersection Performance of Sackville Road with Stannix Park Road Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebenezer Wharf Road												
4	L2	3	0.0	0.003	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.8
21a	L1	1	0.0	0.003	4.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.8
6	R2	2	0.0	0.003	5.4	LOS A	0.0	0.0	0.00	0.58	0.00	53.2
Approach		6	0.0	0.003	5.3	NA	0.0	0.0	0.00	0.58	0.00	53.6
NorthEast: Sackville Road												
7	L2	2	0.0	0.088	5.5	LOS A	0.3	2.3	0.04	0.52	0.04	54.6
8	T1	123	1.7	0.088	4.2	LOS A	0.3	2.3	0.04	0.52	0.04	54.7
26a	R1	3	0.0	0.088	5.8	LOS A	0.3	2.3	0.04	0.52	0.04	54.6
Approach		128	1.6	0.088	4.2	LOS A	0.3	2.3	0.04	0.52	0.04	54.7
West: Lockhart Road												
10a	L1	5	0.0	0.014	6.1	LOS A	0.0	0.3	0.35	0.58	0.35	52.5
12a	R1	7	0.0	0.014	6.1	LOS A	0.0	0.3	0.35	0.58	0.35	53.1
12b	R3	1	0.0	0.014	7.6	LOS A	0.0	0.3	0.35	0.58	0.35	52.4
Approach		14	0.0	0.014	6.2	LOS A	0.0	0.3	0.35	0.58	0.35	52.8
SouthWest: Sackville Road												
30b	L3	4	0.0	0.173	6.5	LOS A	0.7	5.0	0.03	0.52	0.03	55.0
2	T1	252	1.3	0.173	4.2	LOS A	0.7	5.0	0.03	0.52	0.03	54.7
3	R2	1	0.0	0.173	6.0	LOS A	0.7	5.0	0.03	0.52	0.03	54.1
Approach		257	1.2	0.173	4.2	LOS A	0.7	5.0	0.03	0.52	0.03	54.7
All Vehicles		405	1.3	0.173	4.3	NA	0.7	5.0	0.04	0.52	0.04	54.6

Table A6: Priority Intersection Performance of Sackville Road with Ebenezer Wharf Road and Lockhart Road Weekday PM Peak Hour Existing Conditions

APPENDIX B

SIDRA Intersection Results for Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Stannix Park Road												
1	L2	1	0.0	0.021	5.8	LOS A	0.1	0.7	0.11	0.19	0.11	56.9
2	T1	20	21.1	0.021	0.1	LOS A	0.1	0.7	0.11	0.19	0.11	58.4
3	R2	9	66.7	0.021	6.5	LOS A	0.1	0.7	0.11	0.19	0.11	53.1
Approach		31	34.5	0.021	2.3	NA	0.1	0.7	0.11	0.19	0.11	56.6
NorthEast: Sargents Road												
4	L2	13	83.3	0.021	6.7	LOS A	0.1	0.9	0.15	0.55	0.15	50.1
5	T1	1	0.0	0.021	4.4	LOS A	0.1	0.9	0.15	0.55	0.15	53.6
6	R2	6	66.7	0.021	6.9	LOS A	0.1	0.9	0.15	0.55	0.15	50.0
Approach		20	73.7	0.021	6.7	LOS A	0.1	0.9	0.15	0.55	0.15	50.2
NorthWest: Stannix Park Road												
7	L2	5	60.0	0.029	6.2	LOS A	0.0	0.1	0.01	0.08	0.01	55.0
8	T1	42	17.5	0.029	0.0	LOS A	0.0	0.1	0.01	0.08	0.01	59.5
9	R2	1	0.0	0.029	5.5	LOS A	0.0	0.1	0.01	0.08	0.01	57.3
Approach		48	21.7	0.029	0.8	NA	0.0	0.1	0.01	0.08	0.01	59.0
SouthWest: Sargents Road												
10	L2	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.10	0.54	0.10	53.7
11	T1	1	0.0	0.003	4.4	LOS A	0.0	0.1	0.10	0.54	0.10	53.9
12	R2	1	0.0	0.003	5.9	LOS A	0.0	0.1	0.10	0.54	0.10	53.2
Approach		3	0.0	0.003	5.3	LOS A	0.0	0.1	0.10	0.54	0.10	53.6
All Vehicles		102	35.1	0.029	2.5	NA	0.1	0.9	0.07	0.22	0.07	56.2

Table B1: Priority Intersection Performance of Stannix Park Road with Sargents Road Weekday AM Peak Hour Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Sackville Road												
25	T1	241	6.6	0.130	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
26b	R3	1	0.0	0.130	6.7	LOS A	0.0	0.1	0.00	0.00	0.00	57.6
Approach		242	6.5	0.130	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
North: Stannix Park Road												
7b	L3	7	28.6	0.057	7.4	LOS A	0.2	1.8	0.38	0.65	0.38	51.3
9a	R1	34	43.8	0.057	8.1	LOS A	0.2	1.8	0.38	0.65	0.38	50.0
Approach		41	41.0	0.057	8.0	LOS A	0.2	1.8	0.38	0.65	0.38	50.3
SouthWest: Sackville Road												
30a	L1	24	26.1	0.093	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	55.8
31	T1	146	6.5	0.093	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.4
Approach		171	9.3	0.093	0.8	NA	0.0	0.0	0.00	0.09	0.00	58.9
All Vehicles		454	10.7	0.130	1.0	NA	0.2	1.8	0.04	0.09	0.04	58.5

Table B2: Priority Intersection Performance of Sackville Road with Stannix Park Road Weekday AM Peak Hour Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebenezer Wharf Road												
4	L2	5	60.0	0.006	6.2	LOS A	0.0	0.0	0.00	0.57	0.00	51.3
21a	L1	1	0.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.57	0.00	53.9
6	R2	2	50.0	0.006	6.1	LOS A	0.0	0.0	0.00	0.57	0.00	51.1
Approach		8	50.0	0.006	6.0	NA	0.0	0.0	0.00	0.57	0.00	51.6
NorthEast: Sackville Road												
7	L2	2	0.0	0.170	5.5	LOS A	0.7	5.2	0.07	0.51	0.07	54.5
8	T1	236	6.7	0.170	4.3	LOS A	0.7	5.2	0.07	0.51	0.07	54.4
26a	R1	3	66.7	0.170	7.0	LOS A	0.7	5.2	0.07	0.51	0.07	51.8
Approach		241	7.4	0.170	4.3	LOS A	0.7	5.2	0.07	0.51	0.07	54.4
West: Lockhart Road												
10a	L1	12	27.3	0.024	6.3	LOS A	0.1	0.7	0.31	0.60	0.31	51.2
12a	R1	8	12.5	0.024	6.7	LOS A	0.1	0.7	0.31	0.60	0.31	52.5
12b	R3	3	0.0	0.024	7.8	LOS A	0.1	0.7	0.31	0.60	0.31	52.3
Approach		23	18.2	0.024	6.6	LOS A	0.1	0.7	0.31	0.60	0.31	51.8
SouthWest: Sackville Road												
30b	L3	11	20.0	0.117	6.7	LOS A	0.5	3.4	0.03	0.53	0.03	54.0
2	T1	158	6.0	0.117	4.2	LOS A	0.5	3.4	0.03	0.53	0.03	54.5
3	R2	1	0.0	0.117	6.6	LOS A	0.5	3.4	0.03	0.53	0.03	54.0
Approach		169	6.8	0.117	4.4	LOS A	0.5	3.4	0.03	0.53	0.03	54.4
All Vehicles		442	8.6	0.170	4.5	NA	0.7	5.2	0.06	0.52	0.06	54.2

Table B3: Priority Intersection Performance of Sackville Road with Ebenezer Wharf Road and Lockhart Road Weekday AM Peak Hour Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Stannix Park Road												
1	L2	1	0.0	0.026	5.7	LOS A	0.1	0.5	0.04	0.10	0.04	57.9
2	T1	37	0.0	0.026	0.0	LOS A	0.1	0.5	0.04	0.10	0.04	59.5
3	R2	6	83.3	0.026	6.6	LOS A	0.1	0.5	0.04	0.10	0.04	53.2
Approach		44	11.9	0.026	1.1	NA	0.1	0.5	0.04	0.10	0.04	58.5
NorthEast: Sargents Road												
4	L2	8	62.5	0.016	6.4	LOS A	0.1	0.6	0.10	0.55	0.10	51.0
5	T1	1	0.0	0.016	4.4	LOS A	0.1	0.6	0.10	0.55	0.10	53.7
6	R2	6	66.7	0.016	6.8	LOS A	0.1	0.6	0.10	0.55	0.10	50.1
Approach		16	60.0	0.016	6.4	LOS A	0.1	0.6	0.10	0.55	0.10	50.8
NorthWest: Stannix Park Road												
7	L2	4	75.0	0.015	6.4	LOS A	0.0	0.1	0.01	0.11	0.01	54.3
8	T1	21	5.0	0.015	0.0	LOS A	0.0	0.1	0.01	0.11	0.01	59.4
9	R2	1	0.0	0.015	5.5	LOS A	0.0	0.1	0.01	0.11	0.01	57.2
Approach		26	16.0	0.015	1.3	NA	0.0	0.1	0.01	0.11	0.01	58.5
SouthWest: Sargents Road												
10	L2	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.12	0.53	0.12	53.6
11	T1	1	0.0	0.003	4.4	LOS A	0.0	0.1	0.12	0.53	0.12	53.8
12	R2	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.12	0.53	0.12	53.1
Approach		3	0.0	0.003	5.3	LOS A	0.0	0.1	0.12	0.53	0.12	53.5
All Vehicles		89	21.2	0.026	2.2	NA	0.1	0.6	0.05	0.20	0.05	56.8

Table B4: Priority Intersection Performance of Stannix Park Road with Sargents Road Weekday PM Peak Hour Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Sackville Road												
25	T1	123	1.7	0.065	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
26b	R3	1	0.0	0.065	7.0	LOS A	0.0	0.1	0.01	0.01	0.01	57.5
Approach		124	1.7	0.065	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
North: Stannix Park Road												
7b	L3	4	0.0	0.019	7.3	LOS A	0.1	0.5	0.39	0.61	0.39	52.5
9a	R1	11	40.0	0.019	7.7	LOS A	0.1	0.5	0.39	0.61	0.39	50.3
Approach		15	28.6	0.019	7.6	LOS A	0.1	0.5	0.39	0.61	0.39	50.9
SouthWest: Sackville Road												
30a	L1	35	9.1	0.152	5.4	LOS A	0.0	0.0	0.00	0.07	0.00	56.7
31	T1	256	1.2	0.152	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		291	2.2	0.152	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		429	2.9	0.152	0.7	NA	0.1	0.5	0.02	0.07	0.02	59.0

Table B5: Priority Intersection Performance of Sackville Road with Stannix Park Road Weekday PM Peak Hour Existing Conditions with Landscaping Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebenezer Wharf Road												
4	L2	3	0.0	0.003	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.8
21a	L1	1	0.0	0.003	4.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.8
6	R2	2	0.0	0.003	5.4	LOS A	0.0	0.0	0.00	0.58	0.00	53.2
Approach		6	0.0	0.003	5.3	NA	0.0	0.0	0.00	0.58	0.00	53.6
NorthEast: Sackville Road												
7	L2	2	0.0	0.092	5.5	LOS A	0.3	2.5	0.04	0.52	0.04	54.6
8	T1	123	1.7	0.092	4.2	LOS A	0.3	2.5	0.04	0.52	0.04	54.7
26a	R1	5	40.0	0.092	6.8	LOS A	0.3	2.5	0.04	0.52	0.04	52.9
Approach		131	3.2	0.092	4.3	LOS A	0.3	2.5	0.04	0.52	0.04	54.6
West: Lockhart Road												
10a	L1	7	28.6	0.016	6.7	LOS A	0.1	0.4	0.36	0.59	0.36	51.3
12a	R1	7	0.0	0.016	6.1	LOS A	0.1	0.4	0.36	0.59	0.36	53.0
12b	R3	1	0.0	0.016	7.6	LOS A	0.1	0.4	0.36	0.59	0.36	52.4
Approach		16	13.3	0.016	6.5	LOS A	0.1	0.4	0.36	0.59	0.36	52.2
SouthWest: Sackville Road												
30b	L3	4	0.0	0.173	6.5	LOS A	0.7	5.0	0.03	0.52	0.03	55.0
2	T1	252	1.3	0.173	4.2	LOS A	0.7	5.0	0.03	0.52	0.03	54.7
3	R2	1	0.0	0.173	6.0	LOS A	0.7	5.0	0.03	0.52	0.03	54.1
Approach		257	1.2	0.173	4.2	LOS A	0.7	5.0	0.03	0.52	0.03	54.7
All Vehicles		409	2.3	0.173	4.3	NA	0.7	5.0	0.04	0.52	0.04	54.6

Table B6: Priority Intersection Performance of Sackville Road with Ebenezer Wharf Road and Lockhart Road Weekday PM Peak Hour Existing Conditions with Landscaping Traffic



CARPARK AND DRIVEWAY CERTIFICATION OF A PROPOSED LANDSCAPING BUSINESS

99 Sargents Road in Ebenezer

Prepared for: Benbow Environmental

A1815943A (Version 1c)

August 2019

Suite 195, 79 to 83 Longueville Road, Lane Cove NSW 2066

Telephone: 0418 256 674
sydney@mltraffic.com.au

Facsimile: 1300 739 523
www.mltraffic.com.au

1. INTRODUCTION

ML Traffic Engineers was commissioned by Benbow Environmental to prepare a car parking certification report of the proposed landscaping material supplies premises development at 99 Sargents Road in Ebenezer.

Car parking is provided on the ground level with vehicle access and egress via Sargents Road.

Reference is made to AS2890.1 (2004), AS2890.2 (2002) and AS2890.6 and Council's Development Control Plan for compliance.

2. DRIVEWAY

The details of the driveway from Sargents Road into the ground level are as follows from the perspective of the inbound movement for description purposes:

- The driveway at the property line is over 7.6 metres wide

3. CAR SPACES

The details of the car parking areas are as follows:

- The car parking gradient is less than 5 percent
- The car parking aisle is 6.1 metres wide
- The general 90-degree car spaces are 2.5 metres wide with a length of 5.5 metres
 - o Car spaces adjacent to walls have a further 300 mm minimum clearance
- The disabled car space is 2.4 metres wide with 5.5 metres in length
 - o The shared zone has the same dimensions as the disabled car space
 - o A bollard is provided

4. TRUCK LOADING AREA

Trucks will load and unload materials in front of the stock pile area and within the building

5. SWEPT PATHS

A swept turning path analysis is performed using a 19-metre truck to confirm that vehicle movements are adequate.

The following Swept Paths have been performed:

- 19-metre truck forward inbound into and forward outbound from the site
- A rigid truck and trailer (“truck and dog”)

6. CAR SIGHT DISTANCE

The car driver’s sight distance requirement to enter the external road is stated in Figure 3.2 of AS2890.1.

The sight distance varies according to the speed of the external road. Sargents Road has a default speed limit of 50km/hr.

The minimum sight distance required is 45 metres. Site measurements showed that the minimum sight distance looking left or right is met without permanent obstructions.

The pedestrian sight triangle (as set out in Figure 3.3) is met as well.

7. TRUCK SIGHT DISTANCE

The truck driver's sight distance requirement to enter the external road is stated in Figure 3.3 of AS2890.2.

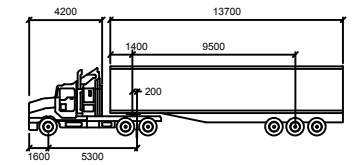
The sight distance varies according to the speed of the external road. Sargents Road has a default speed limit of 50km/hr.

The minimum sight distance required is 69 metres. Site measurements showed that the minimum sight distance looking left or right is met without permanent obstructions.

The pedestrian sight triangle (as set out in Figure 3.4) is met as well.

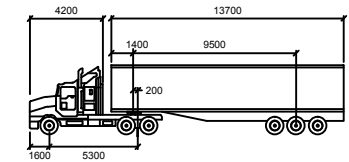
8. CONCLUSIONS AND RECOMMENDATIONS

The car parking area and driveway is generally compliant with Australian Standards for cars and Council's DCP.



S ARTICULATED 19M

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.7
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

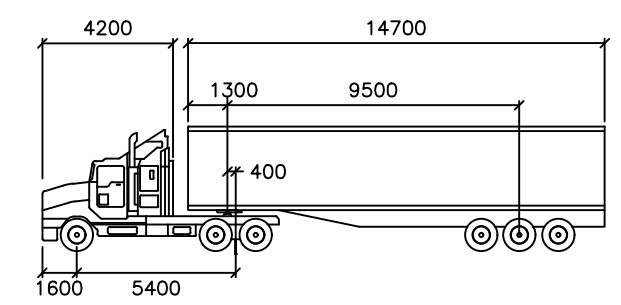


S ARTICULATED 19M

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 27.7
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

Sargents Road

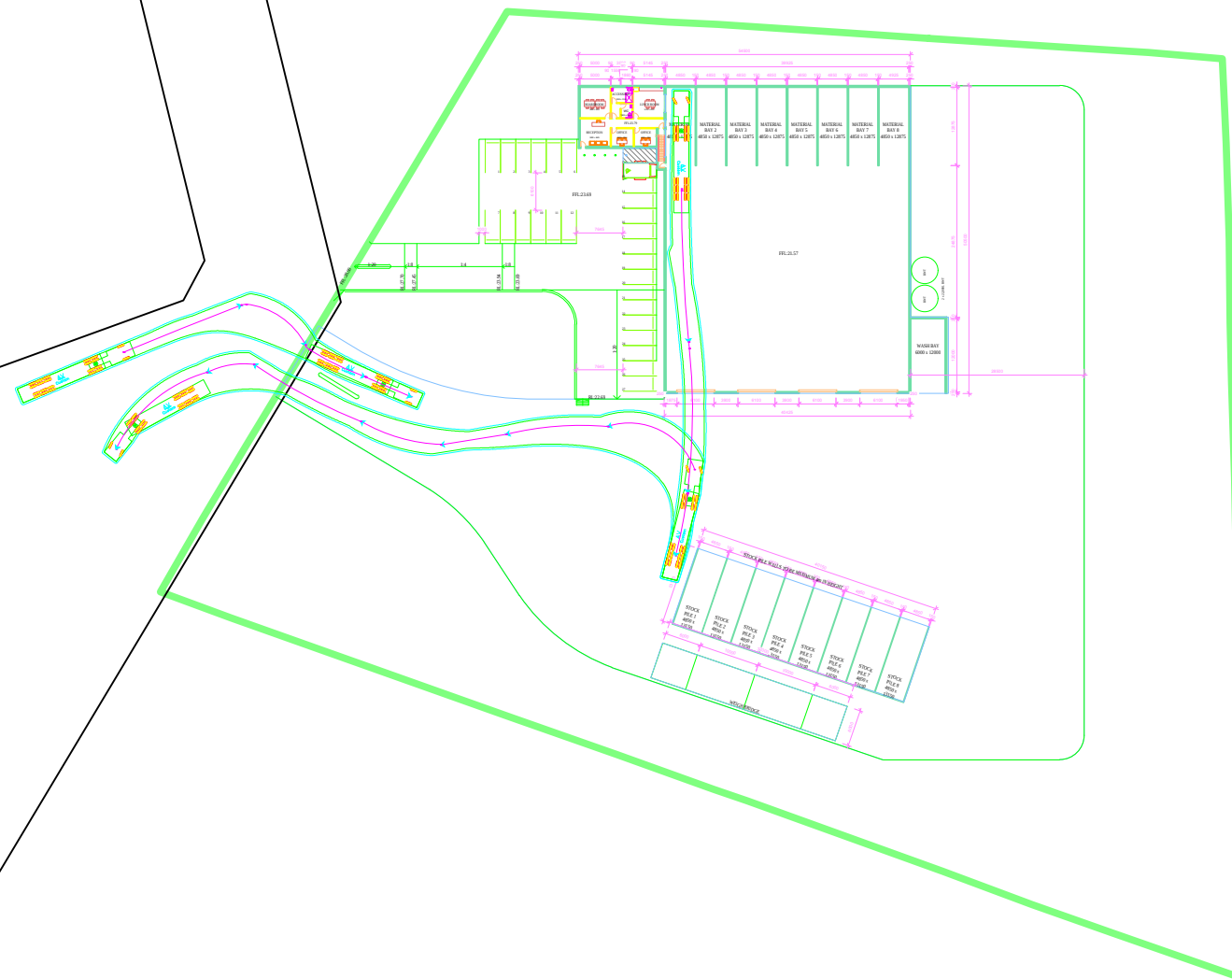
Material Bay 1 Forward Inbound



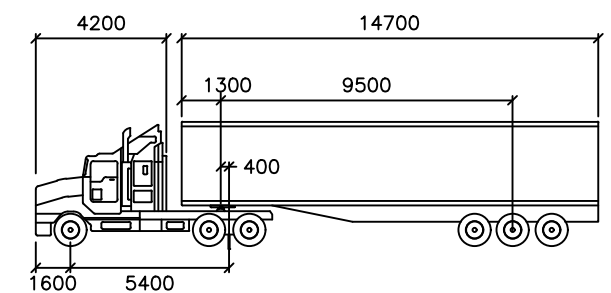
AV

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 28.3
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

Sargents Road



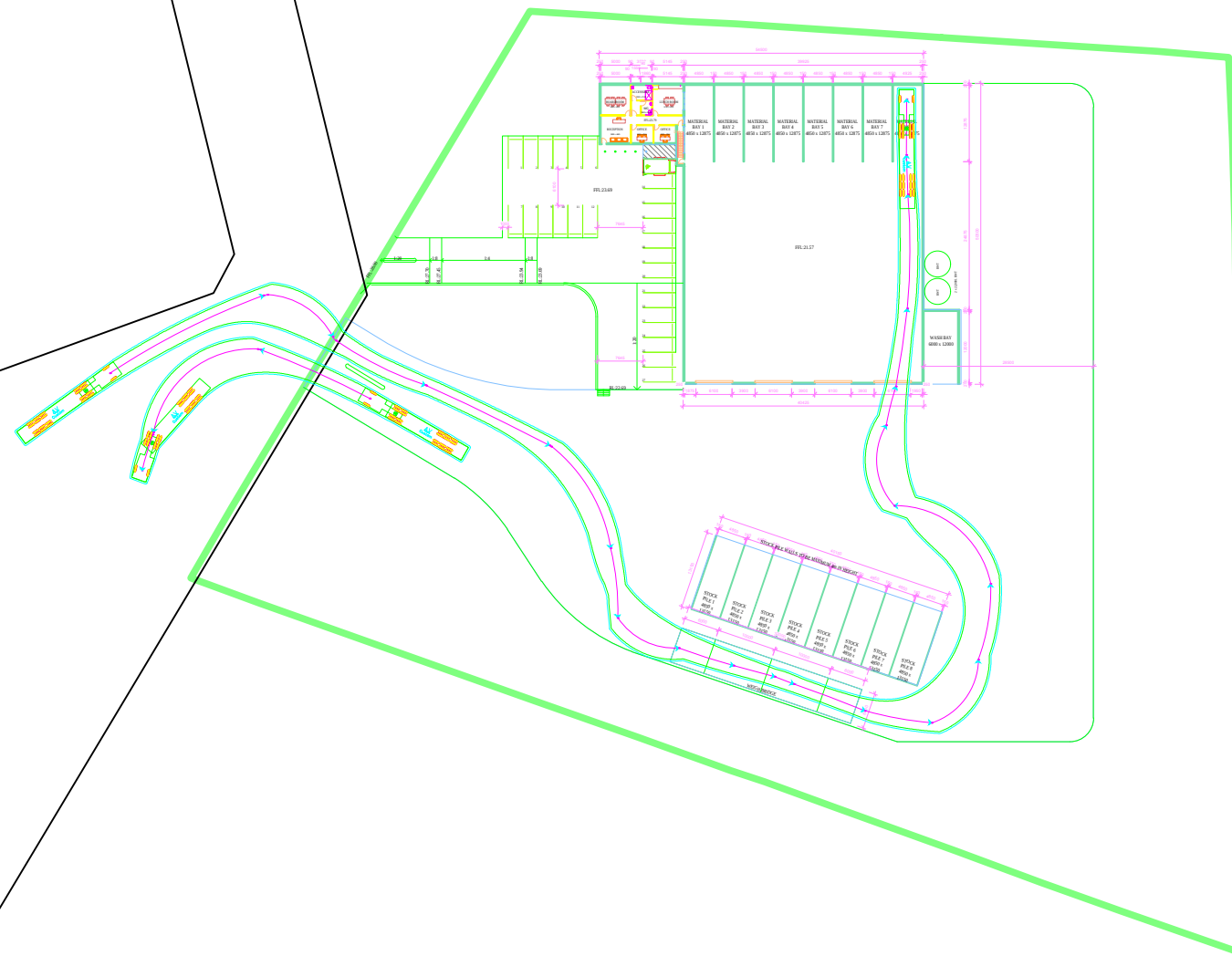
Material Bay 1 Reverse Outbound



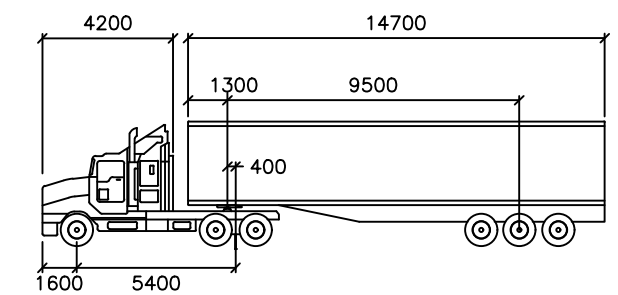
AV

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 28.3
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

Sargents Road



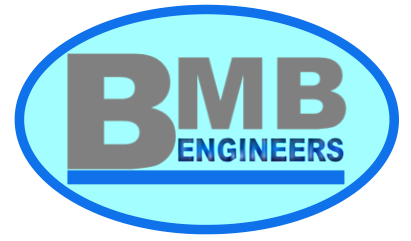
Material Bay 8 Forward Inbound



AV

	mm		
Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 28.3
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

EIS Appendix 6: Flood Impact Assessment



FLOOD IMPACT ASSESSMENT REPORT

99 Sargents Road, Ebenezer

October 2018

Report Description

Report Name	Flood Impact Assessment Report	
Address	99 Sargents Road, Ebenezer	
Client	Hala Alameddine	
Prepared By	Muna Pradhan Flood and Drainage Engineer MIEAust CPEng NER	

Revision History

Date	Version	Author	Comments
22.10.2018	V ₁	MP	First Edition

Contents

1	Introduction	7
2	Site Description	7
3	Proposed Development	8
4	Flood Characteristics	9
5	Flood Related Development Control	13
5.1	Floor Level	13
5.2	Management and Design	13
6	Conclusions	13
Appendix A		14
Flood Information (Source: Hawkesbury City Council)		14

List of Figures

Figure 1 Location of Site (Source: SIX Maps)	7
Figure 2 Survey Plan of Development Site.....	8
Figure 3 Proposed Development	9
Figure 4 Flood Extent Map (Source: Hawkesbury City Council).....	10
Figure 5 Flood Hazard Categorisation in 100 Year ARI Flood (Source: Hawkesbury City Council)	11
Figure 6 Flood Risk Precincts (Source: Hawkesbury City Council)	12

List of Tables

Table 1 Flood Level Data (Source: Hawkesbury City Council).....	9

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1 Introduction

BMB Engineers was commissioned in order to assess the impact of flooding due to the proposed development at 99 Sargents Road, Ebenezer, NSW.

This report has been prepared to accompany a Development Application for the proposed development that will address Hawkesbury City Council's requirements for a flood controlled lot. This report describes the existing characteristics of the area, proposed development and quantifies the impact of flooding due to the proposed development.

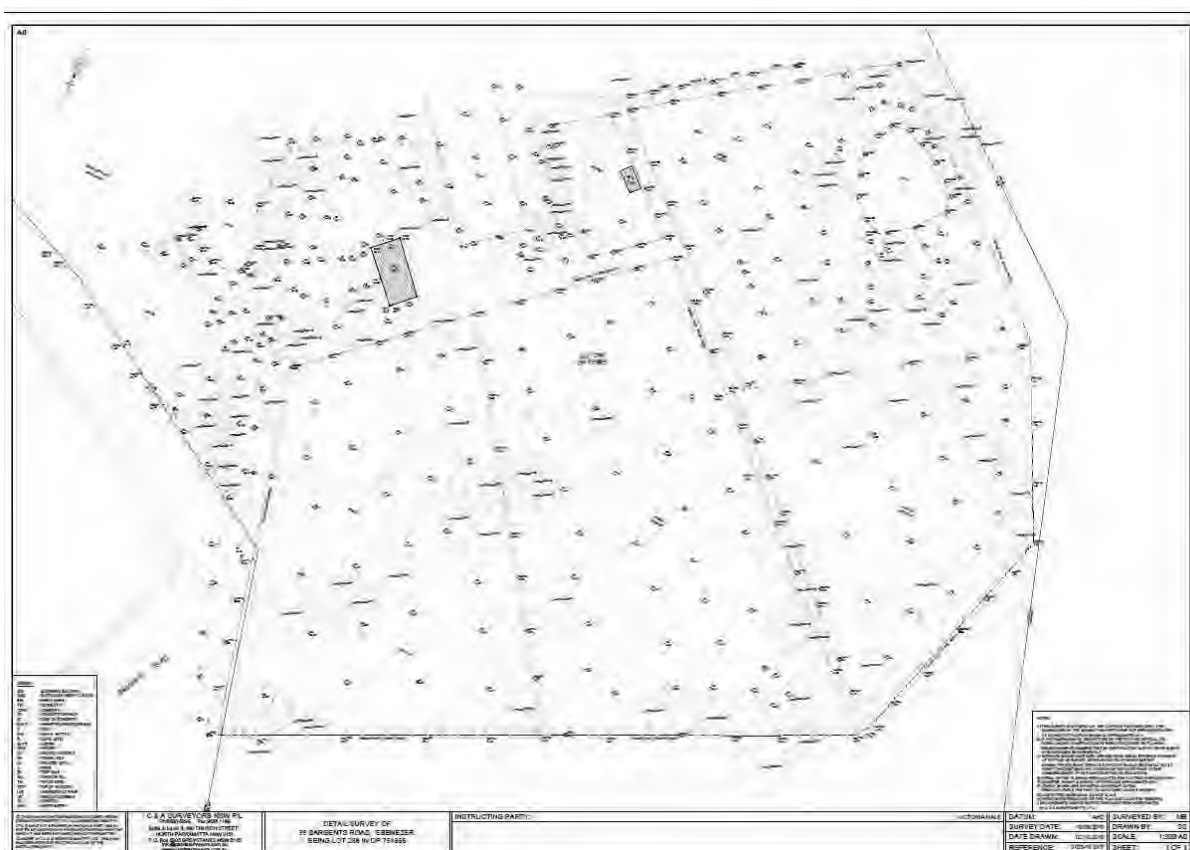
2 Site Description

The site is located to the eastern side of Sargents Road near the junction of Stannix Park Road and Sargents Road. The block is identified as Lot 228 DP 751665. A locality plan of the site is provided in Figure 1 below.



Figure 1 Location of Site (Source: SIX Maps)

The survey plan of the development site is provided in Figure 2. The site is currently developed with a brick cottage with metal roof and few metal sheds. Most of the southern part is covered with vegetation. The terrain of the site is having a trend of sloping towards east. The survey plan shows that the elevation along the Sargents Road varies from 29.65 m to 31.67 m AHD (around the location of the proposed development). The level at the rear boundary of the lot ranges from 7.33m to 9.00 m AHD. The northern and eastern sides of the lot are bounded by the Currency Creek and its tributary.



3 Proposed Development

The proposed development comprises construction of a landscaping material supply premises. The concept site plan of the proposed development is presented in Figure 3.



Figure 3 Proposed Development

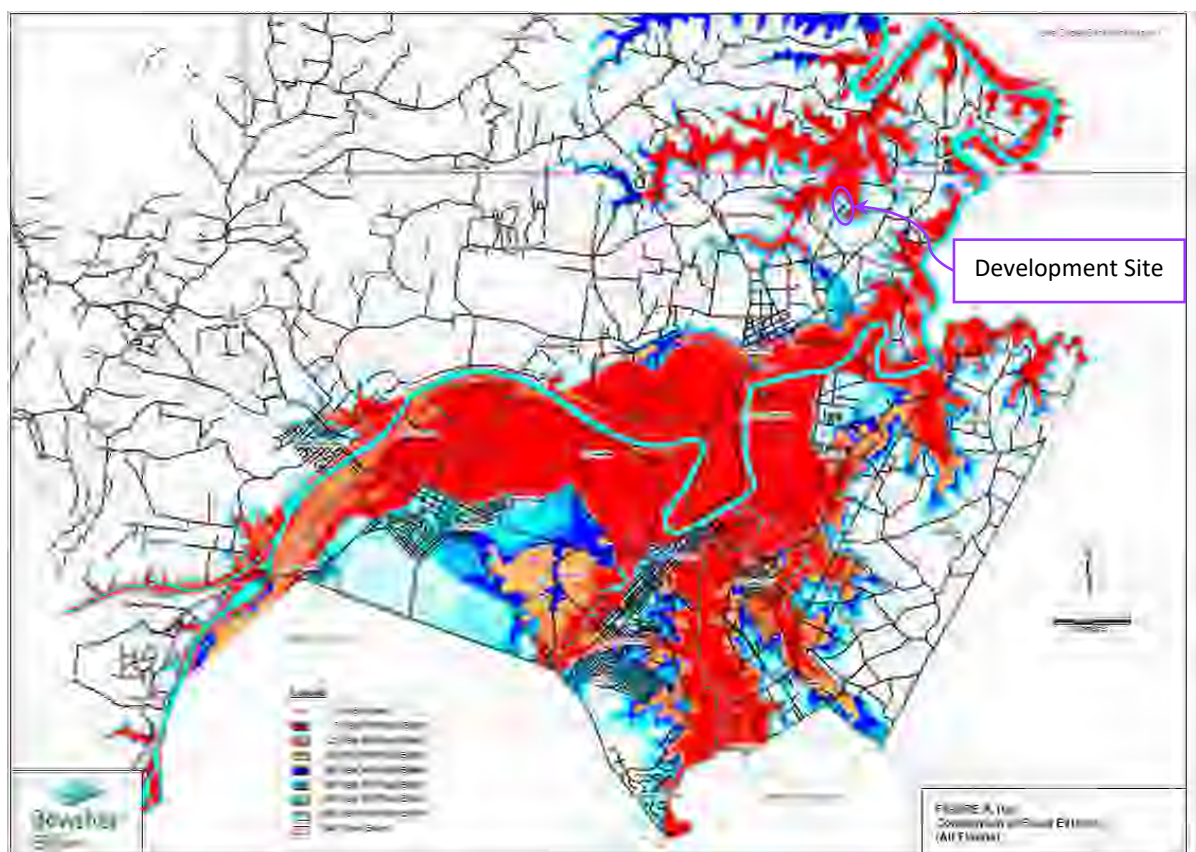
4 Flood Characteristics

Council has advised that the proposed development site is being subject to flooding. Flood level information around the development site provided by Hawkesbury City Council is presented in Table 1 and Appendix A. As the local catchment area is small and there is no well defined valley within the site, no overland flooding due to the local catchment is expected.

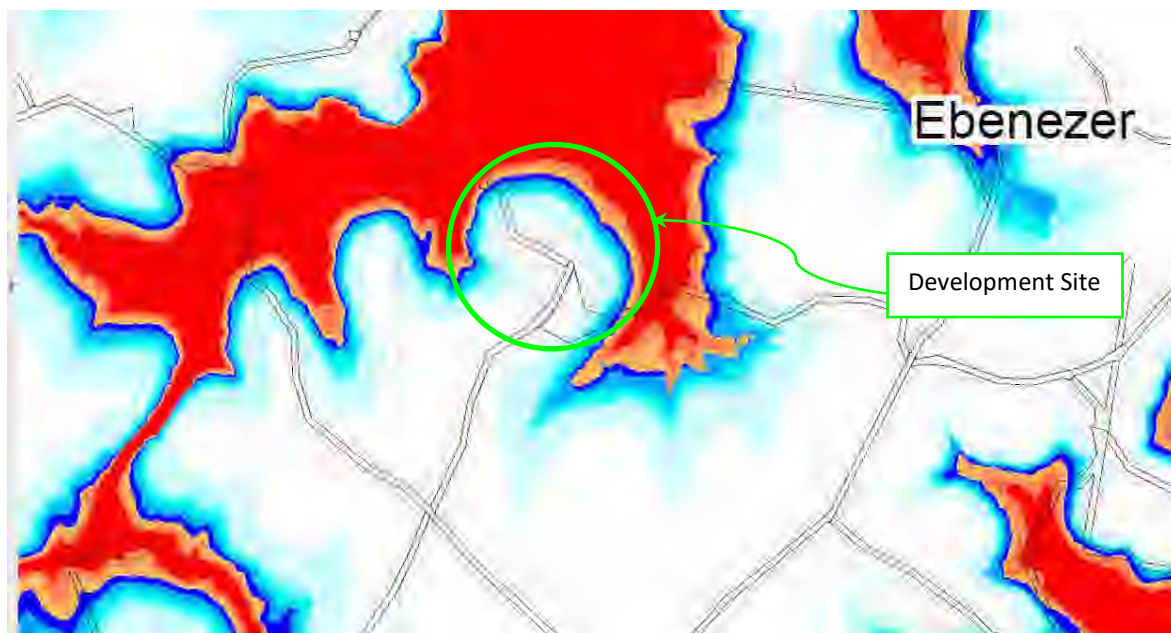
Table 1 Flood Level Data (Source: Hawkesbury City Council)

Average Recurrence Interval (ARI), years	Flood Level, m AHD
100	13.0

Figure 4 shows that the flood extent maps for 5 years ARI to PMF events. Some part of the development site is located even under 5% ARI flood level. The maximum depth of the flood water in 100 year ARI storm could exceed 5 m in some parts. The site is located within low to very high flood hazard (Figure 5) and very low to extreme flood risk precinct (Figure 6).

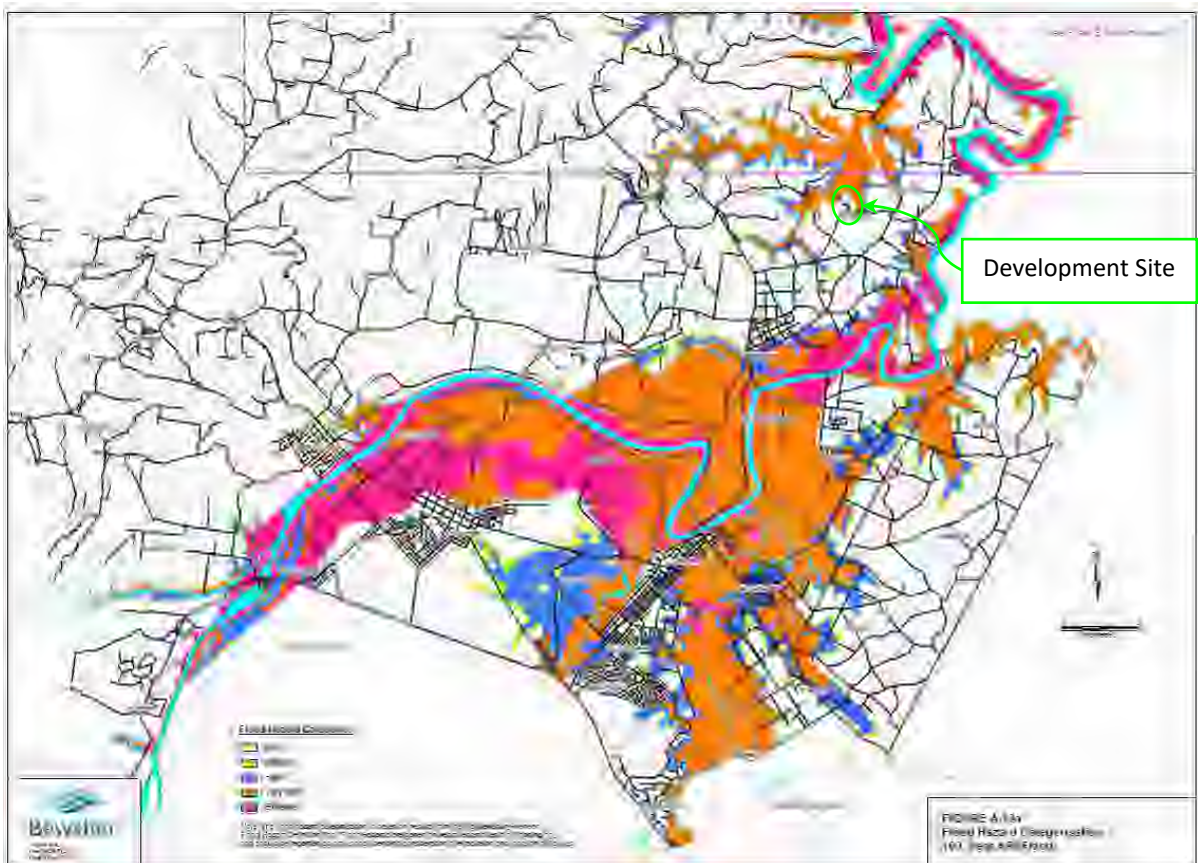


(a) Overall view



(b) Close-up view

Figure 4 Flood Extent Map (Source: Hawkesbury City Council)

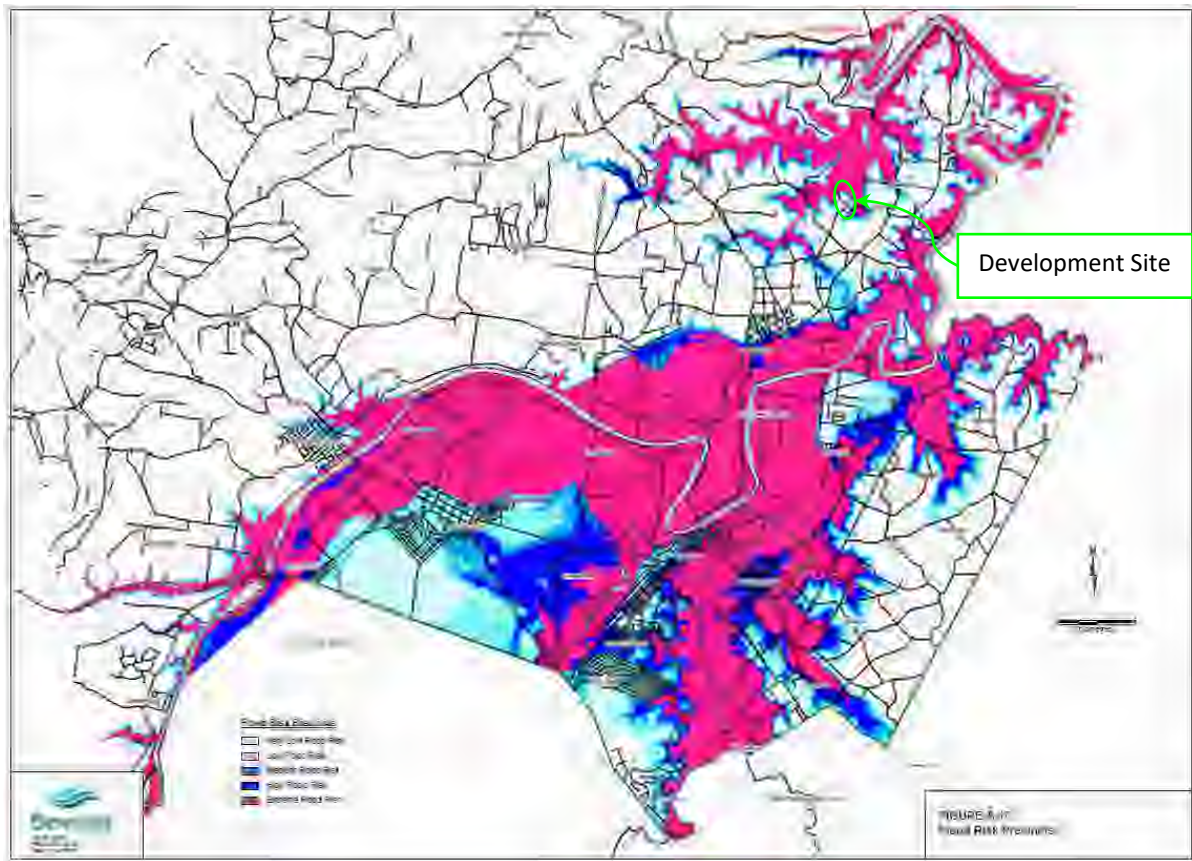


(a) Overall view

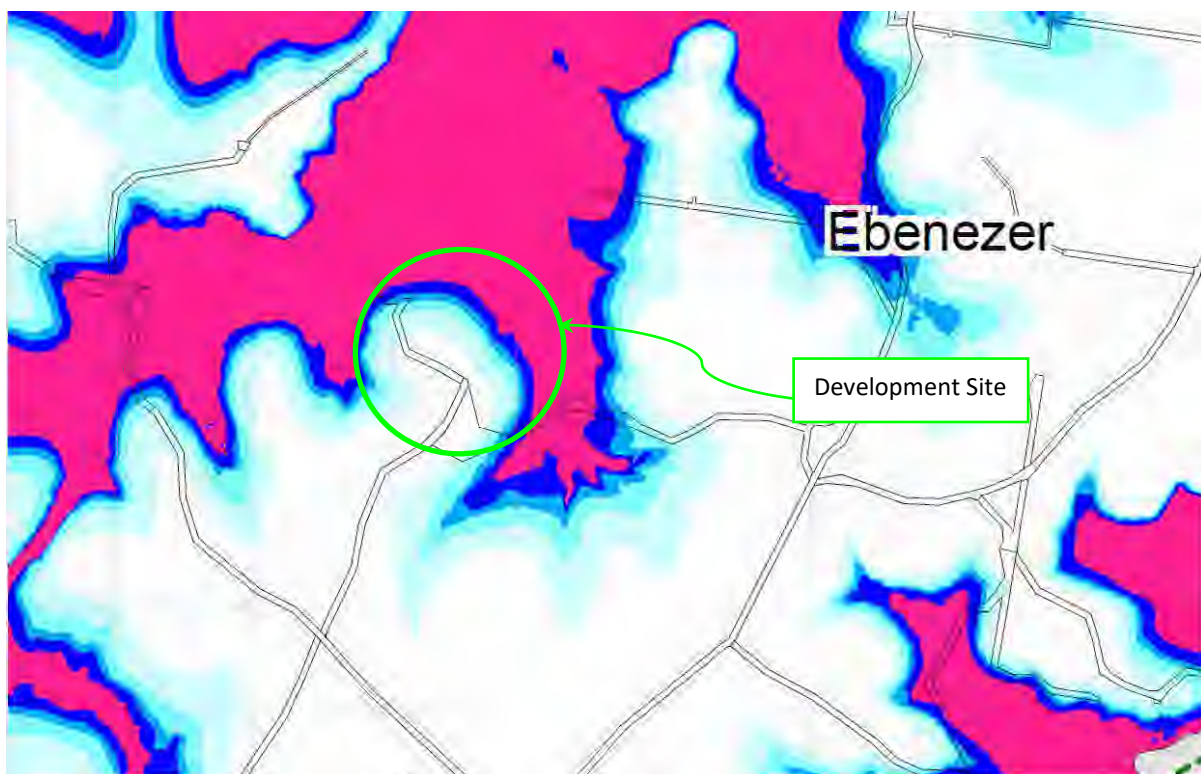


(b) Close-up view

Figure 5 Flood Hazard Categorisation in 100 Year ARI Flood (Source: Hawkesbury City Council)



(a) Overall view



(b) Close-up view

Figure 6 Flood Risk Precincts (Source: Hawkesbury City Council)

5 Flood Related Development Control

A proposal of development has been assessed against Hawkesbury Development Control Plan 2002, Development of Flood Liable Land Policy 2012 of Hawkesbury City Council and Hawkesbury Floodplain Risk Management Study and Plan 2012. The assessments for the flood controls are presented below.

5.1 Floor Level

The proposed office building is located above the PMF level. The shed is located on very low to low flood risk precinct. No flood related development controls apply for both office building and shed so long as they are located above 200 year ARI flood level.

5.2 Management and Design

The entire stockpiles shall be located as high (Ground level) as possible as but no lower than 13 m AHD (100 year ARI Flood level).

6 Conclusions and Recommendations

This study considered the impacts of proposed development at 99 Sargents Road, Ebenezer to the existing flooding characteristics at the site and surroundings.

This proposed redevelopment does not have any adverse effects to the flooding behaviours at the development site and surrounding areas.

The followings are the recommendations from this study:

- The minimum ground level for the proposed stock piles is to be 13m AHD or higher;
- All development controls mentioned in section 5 should be implemented.

Appendix A

Flood Information (Source: Hawkesbury City Council)

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Hawkesbury City Council



Flood Advice - Basic

Applicant

Sanjour Environmental Pty Ltd
PO Box 1621
RACEMATTIA NSW 2124

PL/1042/13

Date of Advice

Date of Advice: 27 August 2018

This advice is for your information only.

Location

The flood advice applies to the following property: 22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1026/1027/1028/1029/1030/1031/1032/1033/1034/1035/1036/1037/1038/1039/1040/1041/1042/1043/1044/1045/1046/1047/1048/1049/1050/1051/1052/1053/1054/1055/1056/1057/1058/1059/1060/1061/1062/1063/1064/1065/1066/1067/1068/1069/1070/1071/1072/1073/1074/1075/1076/1077/1078/1079/1080/1081/1082/1083/1084/1085/1086/1087/1088/1089/1090/1091/1092/1093/1094/1095/1096/1097/1098/1099/1100/1101/1102/1103/1104/1105/1106/1107/1108/1109/1110/1111/1112/1113/1114/1115/1116/1117/1118/1119/1120/1121/1122/1123/1124/1125/1126/1127/1128/1129/1130/1131/1132/1133/1134/1135/1136/1137/1138/1139/1140/1141/1142/1143/1144/1145/1146/1147/1148/1149/1150/1151/1152/1153/1154/1155/1156/1157/1158/1159/1160/1161/1162/1163/1164/1165/1166/1167/1168/1169/1170/1171/1172/1173/1174/1175/1176/1177/1178/1179/1180/1181/1182/1183/1184/1185/1186/1187/1188/1189/1190/1191/1192/1193/1194/1195/1196/1197/1198/1199/1200/1201/1202/1203/1204/1205/1206/1207/1208/1209/1210/1211/1212/1213/1214/1215/1216/1217/1218/1219/1220/1221/1222/1223/1224/1225/1226/1227/1228/1229/1230/1231/1232/1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EIS Appendix 7: Bush Fire Assessment Report

Bush Fire Assessment Report

in relation to the proposed
Waste or Resource Management Facility, Resource
Recovery Facility and Landscape Material Supplies at:



**Lot 288 DP 751665
99 Sargents Road Ebenezer
(subject site)**

Document Tracking

Item	Detail
Project Name	Bush Fire Assessment Report, proposed Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies
Project Address	Lot 288 DP 751665, 99 Sargents Road Ebenezer
Client Name	Benbow Environmental
Project Number	20/0059
Plan Reference	Architectural plans by Baini Design numbered 19083, revision B, dated 7/08/2019 Landscape Plans by JALA Designs Jones & Associates Landscape Architects numbered JALA-19-017, LP01-2 issue A, dated 29/07/2019 Engineering Drawings for proposed Drainage and Site Works by Indesco numbered 6954-DA-000, 001 Issue B, 015 Issue B, 016 Issue B, 017 Issue B, 020 Issue C, 050 Issue C dated 27/03/2020 Stormwater Concept Plan by Australian Consulting Engineers numbered 190745 dated 21/06/2019
Prepared by	Laura Richards
Approved by	Catherine Gorrie
BAL under AS3959-2009	AS3959-2009 Not a Deemed to Satisfy solution for this building class

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Document Control

Version	Primary Author	Description	Date Completed
1	Laura Richards	Draft	6/06/2019
2	Catherine Gorrie	Draft	6/06/2019
3	Laura Richards	Draft	04/02/2020
4	Catherine Gorrie	Inclusion of Landscape Plan	27/02/2020
5	Catherine Gorrie	Inclusion of full plan set	1/04/2020

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Disclaimer

Any recommendation or advice expressed in this report is made in good faith and in accordance with the relevant legislation for bushfire prone development in New South Wales. Bushfire Consulting Services Pty Ltd has endeavoured to ensure that the information in this document is correct. However, many factors outside our current knowledge or control affect the recipient's needs and project plans. Bushfire Consulting Services Pty Ltd does not warrant or represent that the document is free from error or omissions and does not accept liability for any errors or omissions. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information. To the fullest extent possible Bushfire Consulting Services Pty Ltd excludes any express or implied warranty as to condition, fitness, merchantability or suitability of this document and limits its liability for direct or consequential loss at Bushfire Consulting Services Pty Ltd option to re-supplying the document or the cost of correcting the document. In no event shall Bushfire Consulting Services Pty Ltd responses to questions or any other information in this document be deemed to be incorporated into any legally binding agreement without the express written consent of an officer of Bushfire Consulting Services Pty Ltd.

It should be borne in mind that the measures recommended in this report cannot guarantee that a building will survive a bushfire event on every occasion. This is due to the degree of vegetation management, the unpredictable behaviour of bushfires and extreme weather conditions. As such, the author is not liable to any person for any damage or loss whatsoever which has occurred or may occur in relation to the person taking action or not taking action based on the recommendations of this report.

Executive Summary

Bushfire Consulting Services was commissioned by Benbow Environmental to provide a bush fire assessment for the construction of a Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies at Lot 288 DP 751665, 99 Sargents Road Ebenezer. The subject site is mapped as designated bush fire prone land by Hawkesbury Council and has bush fire prone (hazardous) vegetation located within 100m of the building.

The proposal is a form of non-residential development and the following objectives are given consideration in this report in relation to access, water supply and services, and emergency and evacuation planning:

- 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;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- 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; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

This report has considered the elements of bushfire attack and provided the proposed development is constructed in accordance with the recommendations of this report, the development satisfies the relevant aim and objectives of *Planning for Bush Fire Protection*.

Compliance Summary

This Assessment has been Certified by: Catherine Gorrie BPAD-Level 3 Accredited Practitioner FPAA Cert No: BPAD20751	
What is the recommended level of compliance with AS3959-2009?	N/A, AS3959 is not a Deemed-To-Satisfy solution for this building class
Does this development comply with the aim and objectives of PBP relevant to this development?	Yes
Is referral to the NSW Rural Fire Service (RFS) required?	No

List of Abbreviations

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPAD	Bushfire Planning and Design (Accreditation Scheme)
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Hawkesbury Council
DA	Development Application
<i>EP&A Act</i>	<i>Environmental Planning and Assessment Act – 1979</i>
FPA	Fire Protection Association of Australia
IPA	Inner Protection Area
LPMA	Land & Property Management Authority
NCC	National Construction Code
PBP	Planning for Bush Fire Protection 2019
<i>RF Act</i>	<i>Rural Fires Act – 1997</i>
RFS	NSW Rural Fire Service
SIX	Spatial Information Exchange
SWS	Static Water Supply

Contents

Executive Summary	4
Compliance Summary	5
List of Abbreviations	6
Contents	7
1. Introduction	8
2. Purpose of this Report	8
3. Location	9
3.1 Property Description	10
3.2 Zoning	10
4. The Proposal	11
4. Site Assessment	11
5. Vegetation Classification for Site and Surrounds	11
6. Slope	13
6.1 Fire Weather	14
6.2 Access and Egress	15
6.3 Water Supply	15
6.4 Biodiversity Values	16
6.5 Environmental Features	16
7. Asset Protection Zones	16
8. Relevant objectives of PBP	18
9. Recommendations	20
10. Summary	21
11. References	23
12. Legislation	23
Appendix 1 – Proposed Site Plan	24
Appendix 2 – Landscape Plan	25
Appendix 3 – Photos of Site and Surrounds	26
Appendix 4 – Bushfire Risk Assessment Certificate	28

1. Introduction

This report has been commissioned by Benbowen Environmental to provide a bush fire assessment for the proposed Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies at Lot 288 DP 751665, 99 Sargents Road Ebenezer.

The subject property is “bushfire prone land” as per the local Council bushfire prone land map as defined by Section 10.3 (s10.3) of the *Environmental Planning & Assessment Act (EP&A) 1979* and therefore the requirements stipulated by legislation apply.

Planning for Bush Fire Protection 2019 (Chapter 8) describes this type of development as “other non-residential development” and therefore the requirements of section 4.14 (s4.14) of the EP&A Act are applicable.

The bush fire assessment and recommendations are derived from the NSW *EP&A Act*, the Rural Fire Service document *Planning for Bush Fire Protection 2019* and Australian Standard 3959-2009 ‘Construction of Buildings in Bushfire Prone Areas’.

2. Purpose of this Report

The purpose of this report is to provide the owners, the Consent Authority, the Certifier and the Rural Fire Service with a description of the proposed development as well as the vegetation type, slope and any other factors influencing the likely bushfire behaviour, sufficient to show that the development will be protected from the likely bushfire threat as outlined in current legislation.

This independent report is submitted as part of the development application to Council to assist the Council in determining the conditions of consent appropriate to the development.

3. Location

The site is located and known as Lot 288 DP 751665, 99 Sargents Road Ebenezer
The property is part of the Hawkesbury local government area.

Figure 1. Location Map. Source: LPMA SIX Viewer (NSW Government 2019a)



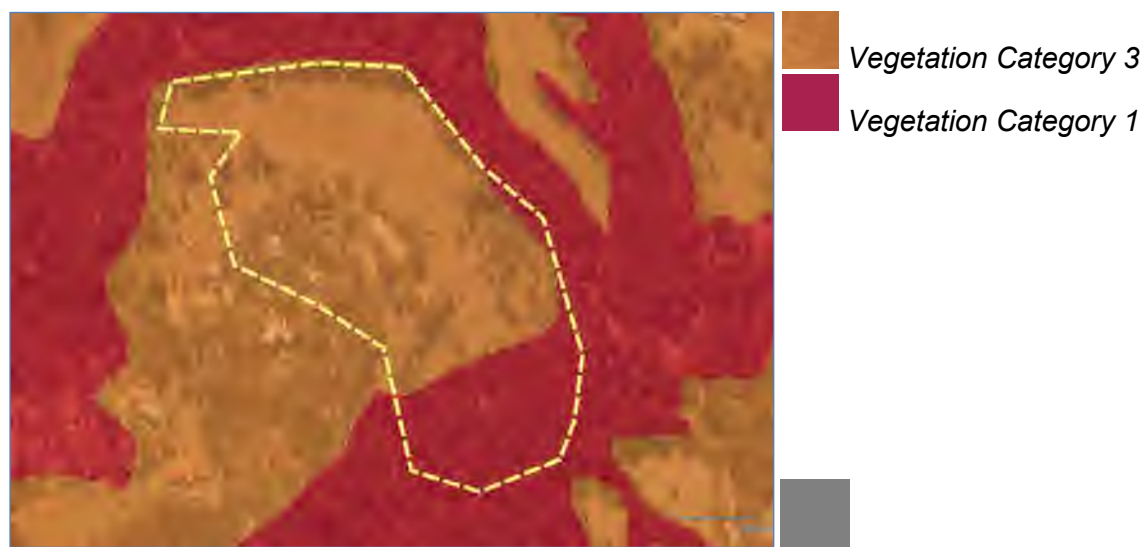
Site location outlined in red

Figure 2. Aerial Map. Source: LPMA SIX Viewer (NSW Government 2019a)



Site location outlined in red

**Figure 3. Bushfire Prone Land Map. Source: NSW Government Planning Portal
(NSW Government 2019b)**



Site location outlined in blue

3.1 Property Description

The property is comprised of Lot 288 DP 751665, 99 Sargents Road Ebenezer, covering approximately 15.18ha in area (Figure 2). It is bounded by private allotments to the north, east, south and west and Sargents Road to the approximate southwest of the lot. It currently contains two single storey dwellings and associated ancillary development, to be retained.

3.2 Zoning

The land is zoned RU1 - Primary Production under Hawkesbury LEP 2012. Adjacent lands are similarly zoned. (Figure 4).

Figure 4. Zoning Map. Source: NSW Government Planning Viewer (NSW Government 2019b)



Site location outlined in yellow

4. The Proposal

The proposal is for a resource management facility, including an office, production warehouse, wash bay, stock-pile area, weigh bridge, retaining walls, and a 28 space car park. The building classification under the Building Code of Australia is Class 5, being an office, Class 7a being a carpark, Class 7b, being a warehouse, and Class 10b, being a weighbridge, wash bay and retaining walls.

4. Site Assessment

Bushfire Consulting Services Pty Ltd attended the site on 16 May 2019. The assessment relates to the site plan (reference Appendix 1 below). The NSW Spatial Services mapping website has also been used as a reference (NSW Government 2019a), and 'Ocean Shores to Desert Dunes' by David Keith (Keith 2004), in determining the vegetation type.

5. Vegetation Classification for Site and Surrounds

The bushfire threat emanates from bushland located to the northeast around to the southwest of the subject building. Hazardous vegetation was classified for a distance of 140m from the subject building according to the methodology of PBP Appendix 1.

Predominant vegetation is classified by structure or formation using the system adopted by Keith (2004). Based on a site visit and determination of vegetation formation using the Keith (2004) Identification Key, the primary bushland vegetation having the potential to affect the subject building is most representative of Forest. The current management of the subject site around the proposal is consistent with an Asset Protection Zone and little vegetation removal is required for this purpose, however it is noted that a number of trees are marked for removal to allow for the building works.

An Asset Protection Zone is to be created on site according to PBP Table A1.12.1, as specifically requested by Council.

Table 1. Hazardous vegetation affecting the subject building

Direction	Vegetation Classification
Northeast	Absence of Classified Vegetation for 90m then Forest
Southeast	Absence of Classified Vegetation for 63m then Forest
Southwest	Absence of Classified Vegetation for >140m
Northwest	Absence of Classified Vegetation for >140m

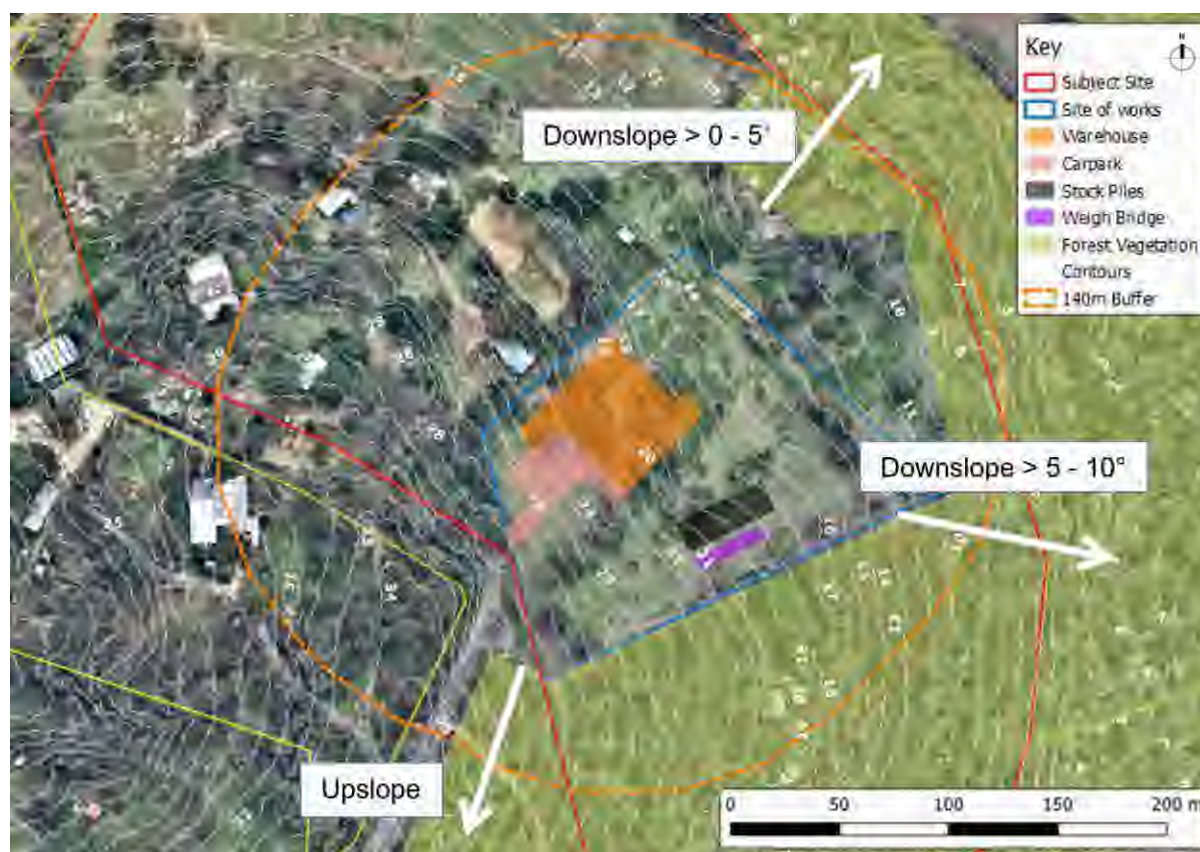
Figure 5: Available separation distance between the production area and office to the hazard:
Source: Nearmap, site plan and overlays by BFCS P/L



6. Slope

The effective slope has been measured manually on site over a distance of 100m from the proposed development where accessible, under the classified vegetation community constituting the hazard. The slope was found to be consistent with the topographical information from NSW Spatial Services LiDAR data.

Figure 6. Slope Diagram. Source: NearMap (2019) and LiDAR (NSW Government 2019a) with overlays by BFCS P/L: Aerial Photography Date: 6/04/2019



Direction from Building Footprint	Slope Description
Northeast	$((9-4)/94.6) \times 1/\tan = 3^\circ$ or Downslope >0- 5°
Southeast	$((13-2)/93.4) \times 1/\tan = 6.7^\circ$ or Downslope >5 - 10°
Southwest	$((29-35)/57) \times 1/\tan = -0.1^\circ$ or Upslope
Northwest	N/A

Note: Effective 'slope' refers to the slope under the classified vegetation in relation to the building, not the slope between the building and the classified vegetation.

6.1 Fire Weather

The development is located in the Hawkesbury Council area, a part of the Greater Sydney Region, which has a Fire Danger Index of 100.

6.2 Access and Egress

Performance Criteria	Acceptable Solutions/Comment
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation	The circulation road is an all-weather road
The capacity of access roads is adequate for firefighting vehicles	The capacity of road surfaces is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), as noted on Sheet 020 of the Engineering Plan
Firefighting vehicles can access the development and exit the property safely	There is a minimum 4m carriageway width There is a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches Property access provides for a loop and a suitable turning area designed in accordance with Appendix 3 Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress The minimum distance between inner and outer curves is 6m Maximum grades for sealed roads do not exceed 15 degrees

6.3 Water Supply

The development includes provision of two 22000 litre rainwater tanks, which exceeds PBP requirements for a fire fighting water supply. The tank is located on a hardened ground surface for truck access, within 4m of the access hole.

6.4 Biodiversity Values

A search of the NSW Office of Environment and Heritage's Biodiversity Values Map has been carried out which indicates land with high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017 located nearby. However the mapped area does not fall near the building or Asset Protection Zone and is therefore considered unlikely to be impacted.

6.5 Environmental Features

In this instance, there are no features on or adjoining the site which may mitigate the impact of a high intensity bushfire on the proposed development. The proposed bushfire protection measures will not adversely impact on the environment. It should be noted that this report has not focused on environmental issues and as such they may require further specialist investigation.

7. Asset Protection Zones

An Asset Protection Zone (APZ) is a fuel-reduced area surrounding a built asset or structure. An APZ provides a buffer zone between a bush fire hazard and an asset and an area of reduced bush fire fuel that allows suppression of fire. It also provides an area from which backburning or hazard reduction can be conducted, and allows emergency services access as well as providing a relatively safe area for firefighters and occupants to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy. PBP has minimum specifications for APZs to be established around a building to be managed as an Inner Protection Area (IPA).

An IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds or flammable shrubs are not to be located under trees and should be no closer than 10m

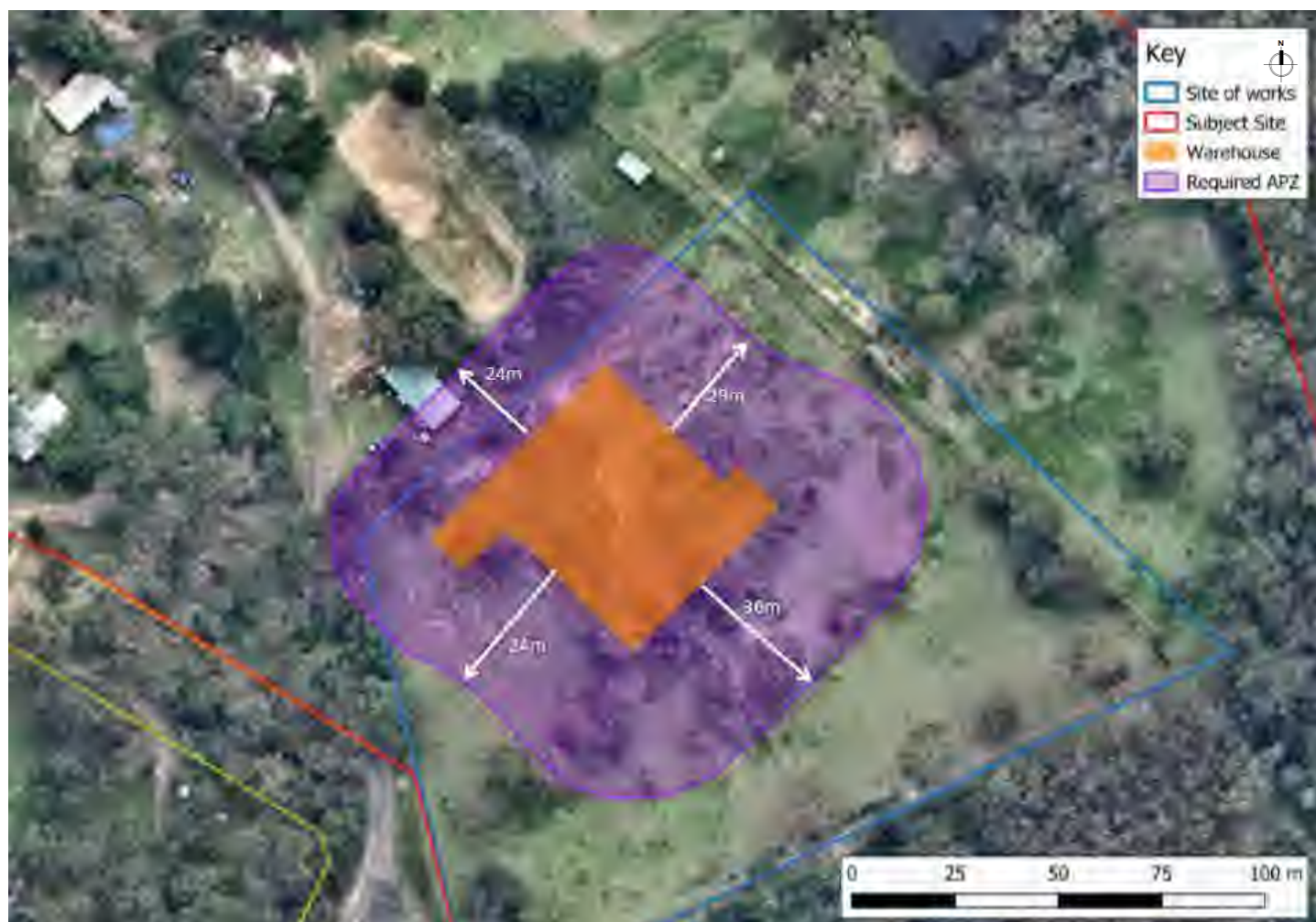
from an exposed window or door. Trees should have lower limbs removed up to a height of 2m above the ground.

In this instance the lot is to be managed as an IPA from the warehouse and offices for a distance of 29m to the northeast, 36m to the southeast, 24m to the southwest and northwest. The IPA currently contains some vegetation requiring removal from the proposed hard surfaces of the site, with 11 trees being shown for removal on the Landscape Plan. The proposed landscaping is consistent with an IPA and the screen plantings are considered to be an “Exclusion – Low threat vegetation”, as described in AS3959-2009 clause 2.2.3.2 (d), *Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.*

In this regard, the screen plantings are greater than 20m from the site of the buildings and any classified vegetation.

Once the building works are implemented, little vegetation modification will be required, and will likely be managed as part of ongoing maintenance of the site.

Figure 7. Proposed APZs. Source: NearMap (2019) and LiDAR (NSW Government 2019a) with overlays by BFCS P/L: Aerial Photography Date: 6/04/2019



8. Relevant objectives of PBP

The objectives for buildings of Class 5-8 under the NCC are outlined in PBP Chapter 8.

Objective	Comment
APZs (required by Council)	Can Comply, an APZ of 24-36m around the subject building is provided in accordance with Table A1.12.2 in Appendix 1, which is accommodated within the subject site boundaries

Objective	Comment
Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation	Can Comply, see section 6.2 above
Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development	Can Comply, the need to formulate an emergency evacuation plan is suggested. To do so, occupants can complete a Bush Fire Safety Plan on the NSW RFS Website http://www.rfs.nsw.gov.au/ under publications / bushfire safety
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	Can Comply, the development includes provision of two 22000 litre rainwater tanks, which exceeds PBP requirements for a fire fighting water supply. The tank is located on a hardened ground surface for truck access, within 4m of the access hole. The tank is to be concrete or metal and all exposed water pipes external to the building are metal, including any fittings Where practical, electrical transmission lines are underground If applicable, reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used, all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side,

Objective	Comment
	connections to and from gas cylinders are metal, polymer-sheathed flexible gas supply lines are not used, and above-ground gas service pipes are metal, including and up to any outlets
Provide for the storage of hazardous materials away from the hazard wherever possible	Can comply, as wherever possible, the storage of hazardous materials will be away from the hazard

9. Recommendations

The following recommendations are made for the bushfire measures for the proposed Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies at, Lot 288 DP 751665, 99 Sargents Road Ebenezer, and are based upon the relevant provisions of the NSW Rural Fire Service Guideline entitled *Planning for Bush Fire Protection 2019*.

1. Asset Protection Zones

At the commencement of the development, and in perpetuity, the lot shall be managed as an IPA APZ from the warehouse for a distance of 29m to the northeast, 36m to the southeast and 24m to the southwest and northwest, as outlined in PBP 2019 Appendix 4.

2. Water Supply

A 20,000 litre static water supply is to be available for fire fighting purposes and suitable fittings sufficient to enable fire fighting. The tank is to be concrete or metal and all exposed water pipes external to the building are metal, including any fittings. A Static Water Supply marker should be obtained from the Rural Fire Service and displayed in a prominent position at the front gate.

3. Electricity and Gas

Where practical, electrical transmission lines are underground.

If applicable, reticulated or bottled gas is installed and maintained in accordance with

- AS/NZS 1596:2014 - The storage and handling of LP Gas,
- the requirements of relevant authorities,
- metal piping is used,
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side
- connections to and from gas cylinders are metal
- polymer-sheathed flexible gas supply lines are not used
- and above-ground gas service pipes are metal, including and up to any outlets.

4. Storage of Hazardous Materials

Wherever possible, the storage of hazardous materials will be away from the hazard.

5. Emergency and Evacuation Planning

The need to formulate an emergency evacuation plan is suggested. To do so, occupants can complete a Bush Fire Safety Plan on the NSW RFS Website <http://www.rfs.nsw.gov.au/> under publications / bushfire safety.

10. Summary

This report consists of a bush fire assessment for the proposed construction of a Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies at Lot 288 DP 751665, 99 Sargents Road Ebenezer. The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.

The development satisfies the aim and objectives of PBP relevant to the development type with the addition of an APZ required by Council.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains and there can be no guarantee because of the variable nature of bushfires that any one building will withstand bushfire attack on every occasion.

This report is a bush fire assessment that provides the required information to assist local Council and the Rural Fire Service in determining compliance in accordance with Planning for Bushfire Protection. The local Council is the final consenting authority and the construction of the building must comply with the requirements included in the Council's conditions of consent.

If any further clarification is required for this report, contact me using the details below.



Catherine Gorrie

(a person who is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bush fire risk assessment)

Accredited Bushfire Planning and Design Practitioner

Fire Protection Association Australia BPAD-Level 3 (BPAD 20751)

Grad Dip Bushfire Protection (UWS 2010)

Diploma Environmental Health & Building Surveying (TAFE 2005)

Corporate Bronze Member Fire Protection Association Australia

Bushfire Consulting Services Pty Ltd

Mob: 0425 833 893

11. References

Keith D 2004, *Ocean Shores to Desert Dunes, the Native Vegetation of NSW and the ACT*, Department of Environment and Conservation, Sydney

NearMap 2019, *NearMap Photomap Aerial Imagery*, NearMap Australia, Barrangaroo, NSW

NSW Government 2019a, *NSW Spatial Services*, NSW Department of Finance, Services and Innovation.

NSW Government 2019b, *NSW Planning Portal*, NSW Department of Planning and Environment.

NSW RFS 2019, *Planning for Bush Fire Protection*, pre-release version, NSW Rural Fire Service, Sydney.

Standards Australia 2009, *Australian Standard AS 3959-2009 'Construction of Buildings in Bushfire Prone Areas'*, SAI Global, Australia.

12. Legislation

Environmental Planning & Assessment Act 1979

Rural Fires Act 1997

Rural Fires Regulation 2013

Appendix 1 – Proposed Site Plan



Appendix 2 – Landscape Plan



Appendix 3 – Photos of Site and Surrounds

Source: BFCS P/L 15/05/2020



Entrance to subject site



Proposed new works location – facing north



*View of proposed works location facing north – absence of classified vegetation for
>100m*



Vegetation along the eastern lot boundary, approximately 90m from the proposed building on the site



Vegetation to the south of the proposed works, approximately 63m from the proposed building on the site



Vegetation approximately 33m southwest of the proposed works, within the subject site, which become part of the APZ

Appendix 4 – Bushfire Risk Assessment Certificate

This form is completed by a recognized consultant in bushfire risk assessment in accordance with section s4.14 of the Environmental Planning and Assessment Act 1979 No 203

PROPERTY ADDRESS:	Lot 288 DP 751665 99 Sargents Road Ebenezer
DESCRIPTION OF PROPOSAL:	Construction of a resource management facility
PLAN REFERENCE: (relied upon in report preparation)	Architectural plans by Baini Design numbered 19083, revision B, dated 7/08/2019 Landscape Plans by JALA Designs Jones & Associates Landscape Architects numbered JALA-19-017, LP01-2 issue A, dated 29/07/2019 Engineering Drawings for proposed Drainage and Site Works by Indesco numbered 6954-DA-000, 001 Issue B, 015 Issue B, 016 Issue B, 017 Issue B, 020 Issue C, 050 Issue C dated 27/03/2020 Stormwater Concept Plan by Australian Consulting Engineers numbered 190745 dated 21/06/2019
BAL RATING	N/A (If the BAL rating is FZ the application is to be referred to NSW RFS for assessment.)
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	YES NO (Circle the relevant response) (If YES the application is to be referred to NSW RFS for assessment.)

I, Catherine Gorrie, of Bushfire Consulting Services Pty Ltd, have carried out a bushfire risk assessment on the above mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in Planning for Bushfire Protection 2019 together with recommendations as to how the relevant specifications and requirements are to be achieved.

REPORT REFERENCE:	20/0059
REPORT DATE:	27/02/2020
CERTIFICATION NO/ACCREDITED SCHEME:	BPAD-Level 3 Accredited Practitioner FPAA Cert No: BPAD20751

Note: this certificate must be completed and signed by a person recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment in accordance with s4.14 of the EP&A Act 1979 No 203.

I hereby certify, in accordance with Section 4.14 of the Environmental Planning and Assessment Act 1979 No 203:

1. That I am a person recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements*.

* The relevant specifications and requirements being; specifications and requirements of the document entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by Section s4.14 of the Environmental Planning and Assessment Act 1979 No 203.

I am aware that the bush fire assessment report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with Planning for Bush Fire Protection 2019.

Attachments:



Bushfire Risk Assessment Report



Recommendations



Statement of vegetation impact in relation to APZ



SIGNATURE:

DATE: 1/04/2020

This Report has been prepared and submitted by
Bushfire Consulting Services Pty Ltd
ACN: 161 040 295

Reference: 20/0059

PO Box 1020
PENRITH NSW 2751
Tel: 02 4744 5800
Mob: 0425 833 893
info@bfcs.com.au
www.bfcs.com.au
1 April 2020

Bushfire Compliance of Plans Certificate

in relation to the proposed
Waste or Resource Management Facility, Resource
Recovery Facility and Landscape Material Supplies
at:

Lot 288 DP 751665
99 Sargents Road Ebenezer
(subject site)



Scope

This document relates exclusively to the Plans to accompany an application to the Consent Authority for a Waste or Resource Management Facility, Resource Recovery Facility and Landscape Material Supplies and their compliance with Planning For Bushfire Protection 2019.

An Asset Protection Zone (APZ) has been planned at Council's request in accordance with Table A1.12.2 in Appendix 1 of Planning For Bushfire Protection 2019 to be managed as an Inner Protection Area (IPA) from the warehouse and offices for a distance of 29m to the northeast, 36m to the southeast and 24m to the southwest and northwest.

Landscape Plans by JALA Designs Jones & Associates Landscape Architects numbered JALA-19-017, LP01-02 issue A, dated 29/07/2019 show compliance with these provisions. The following plans and documents have been assessed as being consistent with the requirements of Planning For Bushfire Protection 2019.

Documentation

- Architectural plans by Baini Design numbered 19083, revision B, dated 7/08/2019
- Landscape Plans by JALA Designs Jones & Associates Landscape Architects numbered JALA-19-017, LP01-2 issue A, dated 29/07/2019
- Engineering Drawings for proposed Drainage and Site Works by Indesco numbered 6954-DA-000, 001 Issue B, 015 Issue B, 016 Issue B, 017 Issue B, 020 Issue C, 050 Issue C dated 27/03/2020
- Stormwater Concept Plan by Australian Consulting Engineers numbered 190745 dated 21/06/2019

Certification

I, Catherine Gorrie, of Bushfire Consulting Services Pty Ltd am satisfied that proposed development as outlined in the plans are consistent with PBP 2019.

Qualification of person making Certification Statement

I am a recognised consultant in Bushfire Risk Assessment in accordance with section 4.14 (s4.14) of the Environmental Planning and Assessment Act 1979 No. 203.



Catherine Gorrie

(a person who is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bush fire risk assessment)

Accredited Bushfire Planning and Design Practitioner

Fire Protection Association Australia BPAD-Level 3 (BPAD 20751)

Grad Dip Bushfire Protection (UWS 2010)

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Corporate Bronze Member Fire Protection Association Australia

Bushfire Consulting Services Pty Ltd

Mob: 0425 833 893

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The information and intellectual property contained in this document is confidential and is proprietary to the company Bushfire Consulting Services Pty Ltd. It is intended for use only by the person, company or organisation to whom it is provided and only for the stated purpose for which it is provided. It must not be used for any other purpose or by any other individual or organisation without the written approval of the author.

Disclaimer

Any recommendation or advice expressed in this report is made in good faith and in accordance with the relevant legislation for bushfire prone development in New South Wales. It should be borne in mind that the measures recommended in this report cannot guarantee that a building will survive a bushfire event on every occasion. This is due to the degree of vegetation management, the unpredictable behaviour of bushfires and extreme weather conditions. As such, the author is not liable to any person for any damage or loss whatsoever which has occurred or may occur in relation to the person taking action or not taking action based on the recommendations of this document.

EIS Appendix 8: Waste Management Plan

Hawkesbury City Council

366 George Street (PO Box 146) Windsor NSW 2756 DX 8601 WINDSOR
Phone: (02) 4560 4444 Facsimile: (02) 4587 7740 Email: council@hawkesbury.nsw.gov.au

waste management plan

demolition, construction and use of a premises

The applicable sections of this table must be completed and submitted with your development application.

The information provided on this form (and on your plans) will be assessed against the provisions of the Management of Construction and Demolition Waste chapter of the Hawkesbury Development Control Plan.

Should the space provided in this form be insufficient, please attach additional details.

Outline of the Proposal

Site Address

99 SARGENTS ROAD
EBENEZER NSW 2756

Name of Applicant

HALA CONSTRUCTIONS PTY LTD

Applicant Address

94 RAILWAY ST
YENNORA NSW 2161

Phone

0404683583

Mobile

0499 886 333

Fax

Buildings and other structures currently on the site

The northern portion of the site is used as an equestrian centre & contains a cottage, shed & rainwater tanks. These will remain. The development will be located on a 2 hectare area of the site that is partially cleared & currently vacant.

Description of proposal

Establishment of a landscaping supply business and resource recovery facility for acceptance of VENM, ENM, concrete, bricks and greenwaste (trees & garden waste - no food waste) to be crushed & screened and sold as recovered fines & aggregates in bulk. Processing would occur within a new building.

Applicant's signature

H. Black

Date

1/18/19



Section 1: Demolition

Materials		Destination		
		Re-Use and Recycling		Disposal
Material	Estimated Volume (m ² or m ³)	On-Site Specify proposed Re-Use or On-Site Recycling	Off-Site Specify Contractor and Recycling Outlet	Specify Contractor and Landfill Site
Excavation Material	N/A	N/A	N/A	N/A
Green Waste	N/A	N/A	N/A	N/A
Bricks	N/A	N/A	N/A	N/A
Concrete	N/A	N/A	N/A	N/A
Timber What kind?	N/A	N/A	N/A	N/A
Plasterboard	N/A	N/A	N/A	N/A
Metals What kind?	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A

Note: Details of on-site waste management should be provided on the plans accompanying your application (ie - location of on-site storage areas/containers, vehicular access point)

Hawkesbury City Council



Section 2: Construction

Materials		Destination		
		Re-Use and Recycling		Disposal
Material	Estimated Volume (m ² or m ³)	On-Site Specify proposed Re-Use or On-Site Recycling	Off-Site Specify Contractor and Recycling Outlet	Specify Contractor and Landfill Site
Excavation Material	0	used for cut & fill on site	N/A	N/A
Green Waste	20 m ³	mulched & reused on site	N/A	N/A
Bricks	0	N/A	N/A	N/A
Concrete	2 tonne	N/A	BINGO St Marys	N/A
Timber What kind? Pallets, board finishes	1 tonne	N/A	BINGO St Marys	N/A
Plasterboard	0.5 tonne	N/A	BINGO St Marys	N/A
Metals What kind? Scrap	0.5 tonne	N/A	BINGO St Marys	N/A
Other N/A	N/A	N/A	N/A	N/A

Note: Details of on-site waste management should be provided on the plans accompanying your application (ie - location of on-site storage areas/containers, vehicular access point)



Section 3: On-going use of a premise

Type of waste to be generated	Expected volume (per week)	Proposed on-site storage and treatment facilities	Destination
1. General office waste	1 x 240 L Bin	1 x 240 L Bin	Council Service
2. Recyclable office waste	1 x 240 L Bin	1 x 240 L Bin	"
3. Residual waste material	8 tonnes	Storage Bay within Building	Eastern Creek Landfill
4. Wash bay residual waste	2 tonnes/yr	Recycling system of wash bay	Eastern Creek Landfill

Note: Attach plans showing the location of waste storage and collection areas, and access routes for tenants and collection vehicles.

Section 4: On-going management of a premise

Describe how you intend to ensure the on-going management of waste on-site.
(eg: lease conditions, caretaker/manager on-site)

Waste material (excavated material, brick, concrete & greenwaste) are brought on site as raw materials. These would be stored within an enclosed building. Processed materials would be stored in bays with 3-walled sides.

Waste generated from the office would be stored in designated waste bins & serviced by a licensed contractor.

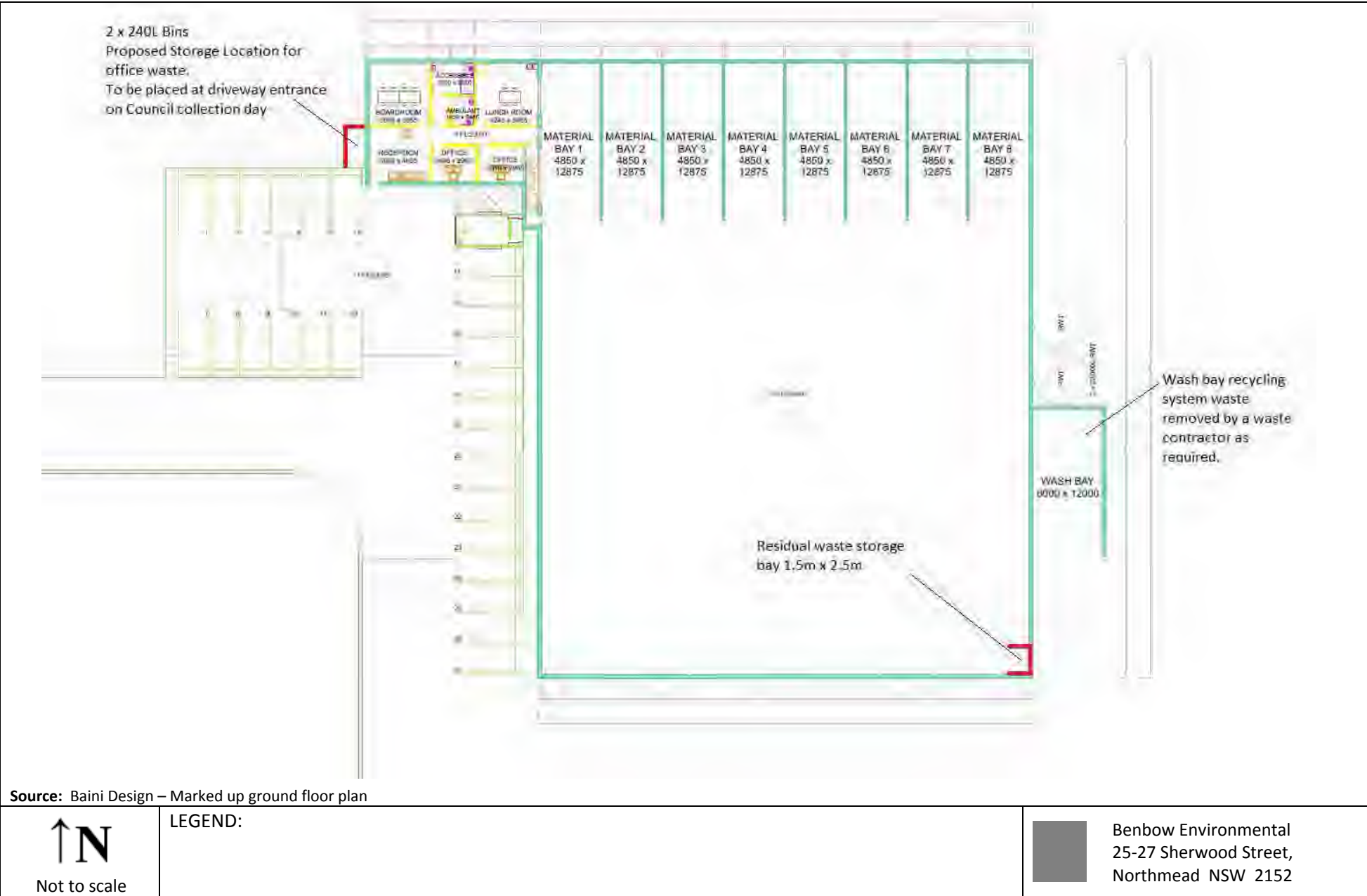
Any residual waste unable to be processed/recycled would be stored in a designated bay inside the building & removed by a waste contractor.

An "incoming waste inspection" would ensure no hazardous material is accepted (see EIS)

Privacy Notice

Council is bound by the provisions of the Privacy and Personal Information Protection Act 1998, in the collection, storage and utilisation of personal information provided in this form. Accordingly the personal information will only be utilised for the purposes for which it has been obtained and may be available for public access and/or disclosure under various NSW Government legislation.

Figure 1: Proposed waste storage and collection areas



EIS Appendix 9: Site Plans

99 SARGENTS ROAD, EBENEZER NSW 2756
LOT 288/ DP751665 | HAWKESBURY CITY COUNCIL

COMPLIANCE TABLE

ITEM		PROPOSED	STANDARD	COMPLIANCE
B	SITE AREA	19,192.55 m²		
C	SETBACK			
	FRONT	16 m	15 m	YES
	REAR	45 m	-	YES
	SIDE	8 m	-	YES
D	GROSS FLOOR AREA			
	GROUND FLOOR	2135 m²		
	TOTAL GROSS FLOOR AREA	2135 m²		
E	FSR	0.80 : 1	-	YES
F	HEIGHT	10 m	10 m	YES
I	CAR PARKING			
	VISITORS	27 SPACES	4 SPACE PER 300m² then 1 space per 90m²	YES
	TOTAL CAR SPACES	27 SPACES	24.3 SPACES	YES

DRAWING REGISTER	
Sheet Number	Sheet Name
00	COMPLIANCE TABLE
01	SITE PLAN
02	GROUND FLOOR PLAN
03	EAST AND WEST ELEVATIONS
04	NORTH & SOUTH ELEVATION
05	SECTIONS
06	MATERIALS SCHEDULE
07	SEDIMENTATION PLAN

LOCATION MAP



REV	DESCRIPTION	DATE	BY
A	CONCEPT PLANS	01/03/19	CB
B	ISSUED FOR DA	07/08/19	CB

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18 Villiers street
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Sydney, Australia
Phone + 61 2 9188 8250
info@bainidesign.com.au
www.bainidesign.com.au

PROJECT TITLE
PROPOSED RESOURCE MANAGEMENT FACILITY
99 SARGENTS ROAD, EBENEZER NSW 2756

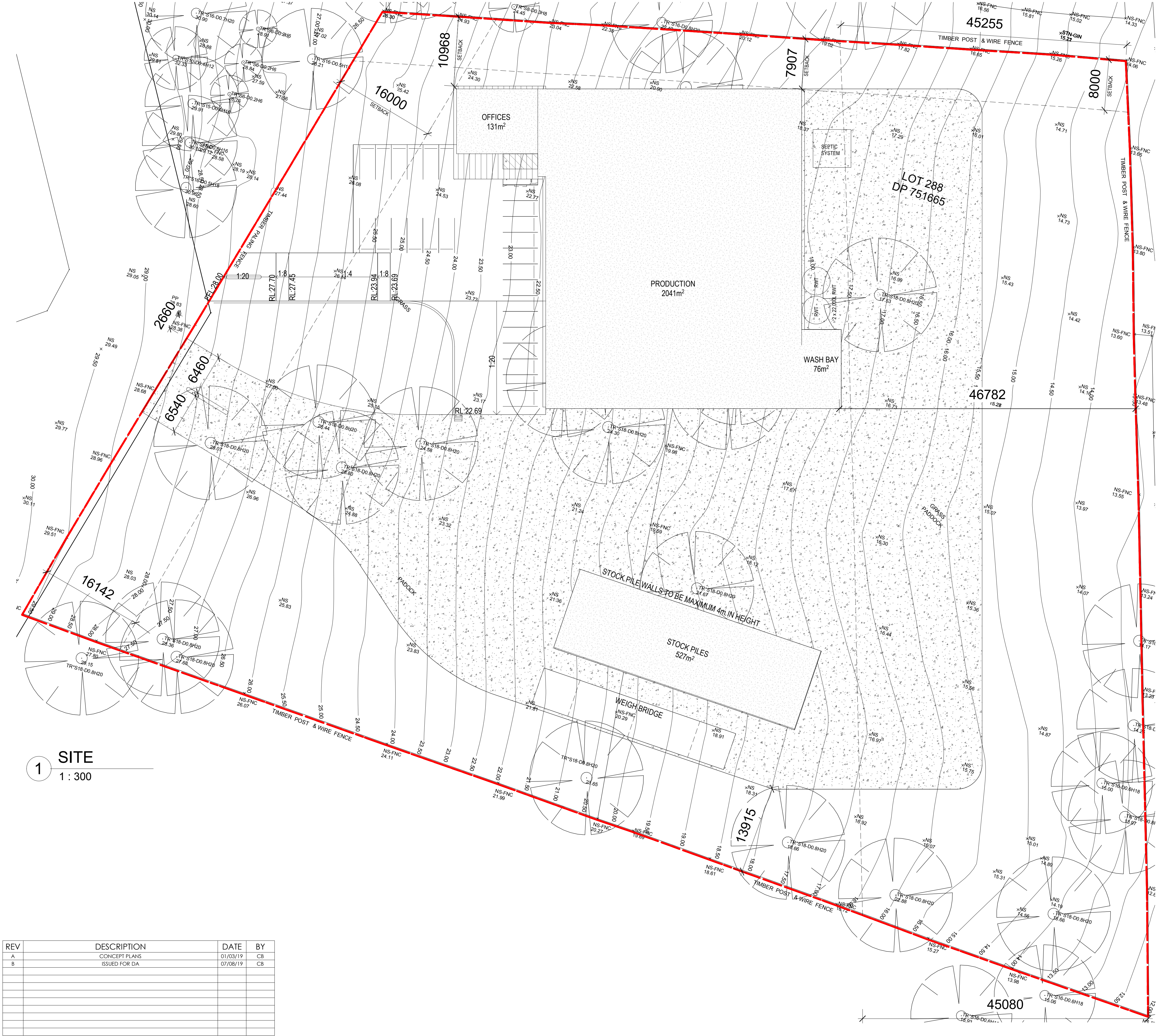
DRAWING TITLE
COMPLIANCE TABLE

PROJECT NUMBER
19083

DRAWING NUMBER	DATE	REVISION
00	06/07/17	B
SCALE @ A1	DRAWN BY FM	CHECKED BY CB

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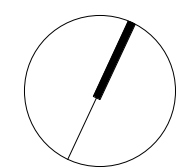
FOR DA APPROVAL



REV	DESCRIPTION	DATE	BY
A	CONCEPT PLANS	01/03/19	CB
B	ISSUED FOR DA	07/08/19	CB

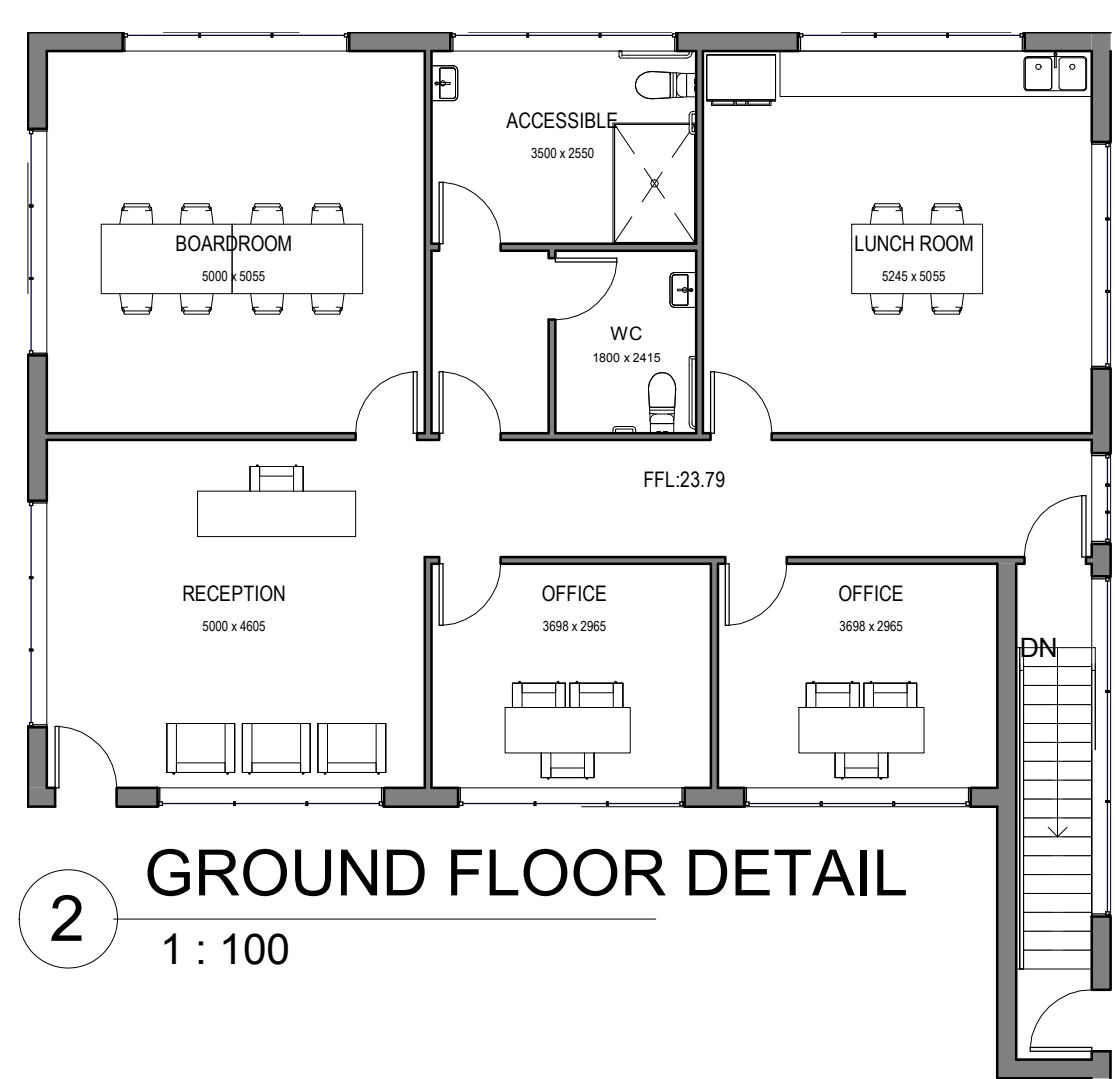
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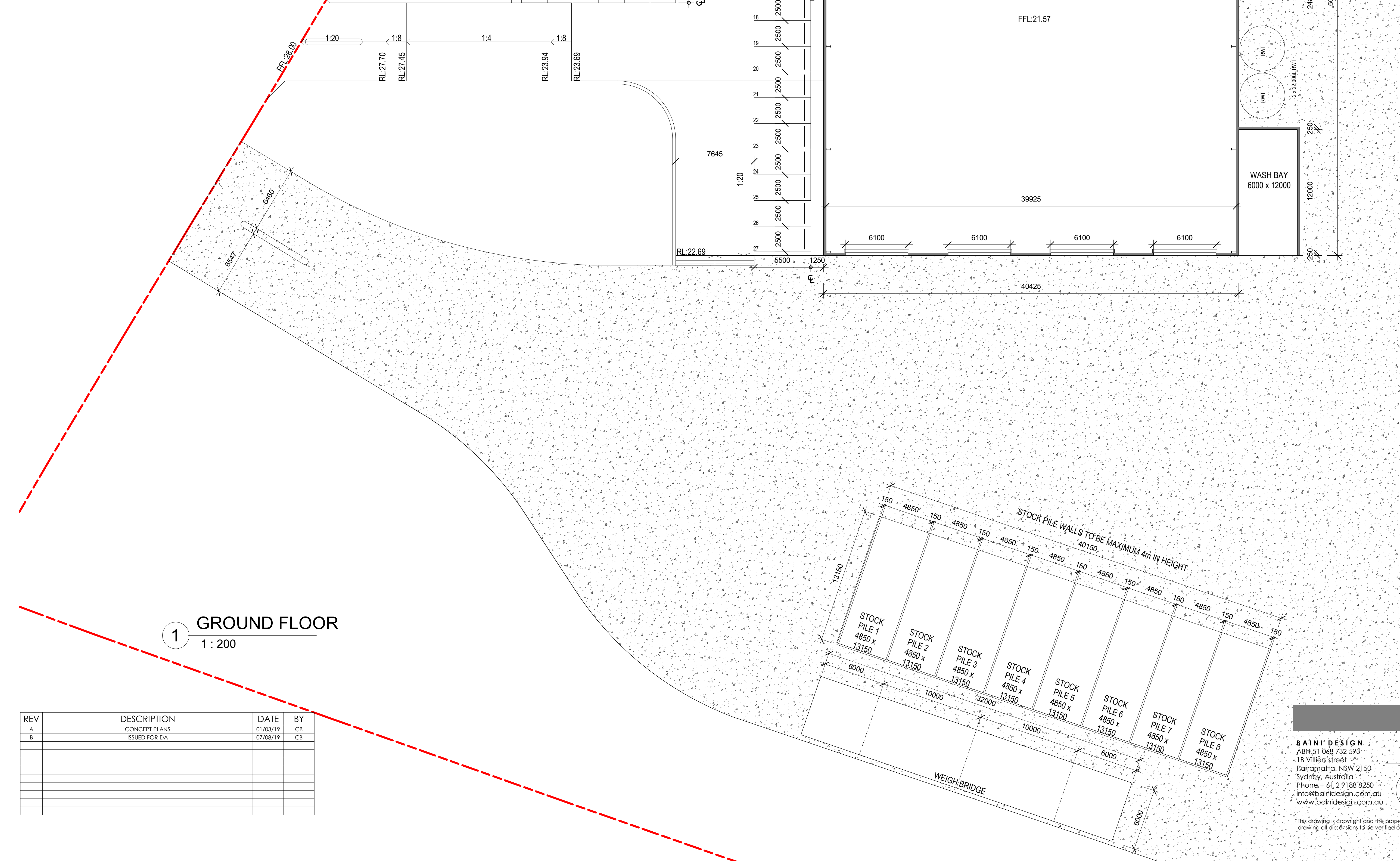


PROJECT TITLE			
PROPOSED RESOURCE MANAGEMENT FACILITY			
99 SARGENTS ROAD, EBENEZER NSW 2756			
DRAWING TITLE			
SITE PLAN			
PROJECT NUMBER	DRAWING NUMBER	DATE	REVISION
19083	01	06/07/17	B
	SCALE @ A1	DRAWN BY	CHECKED BY
	1 : 300	FM	CB

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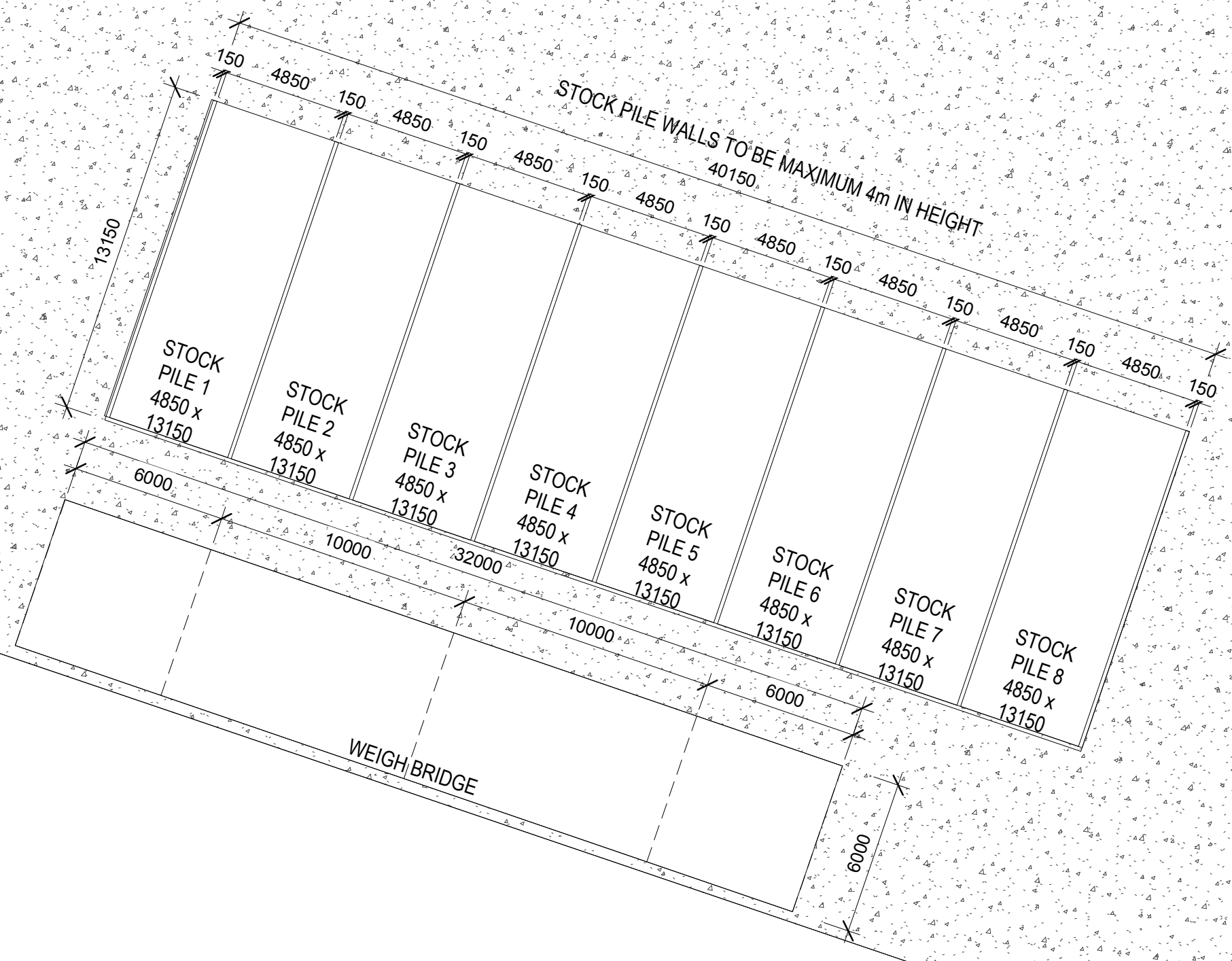


2 GROUND FLOOR DETAIL
1 : 100

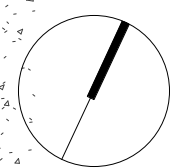


1 GROUND FLOOR
1 : 200

REV	DESCRIPTION	DATE	BY
A	CONCEPT PLANS	01/03/19	CB
B	ISSUED FOR DA	07/08/19	CB



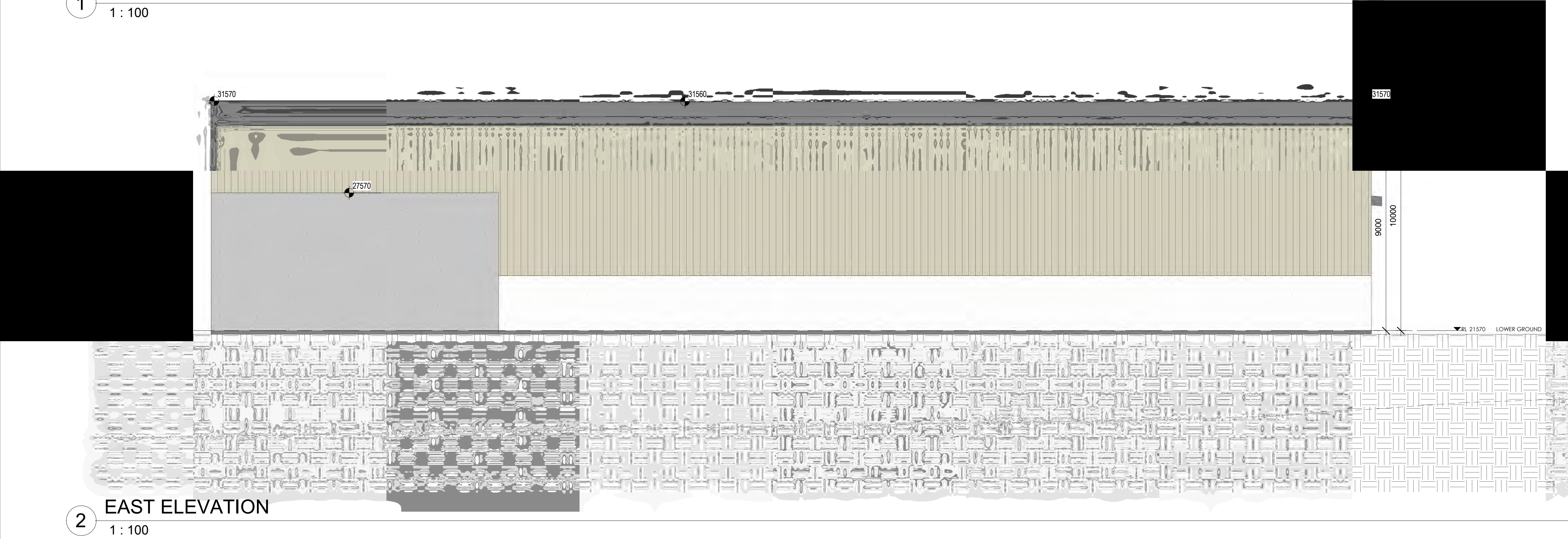
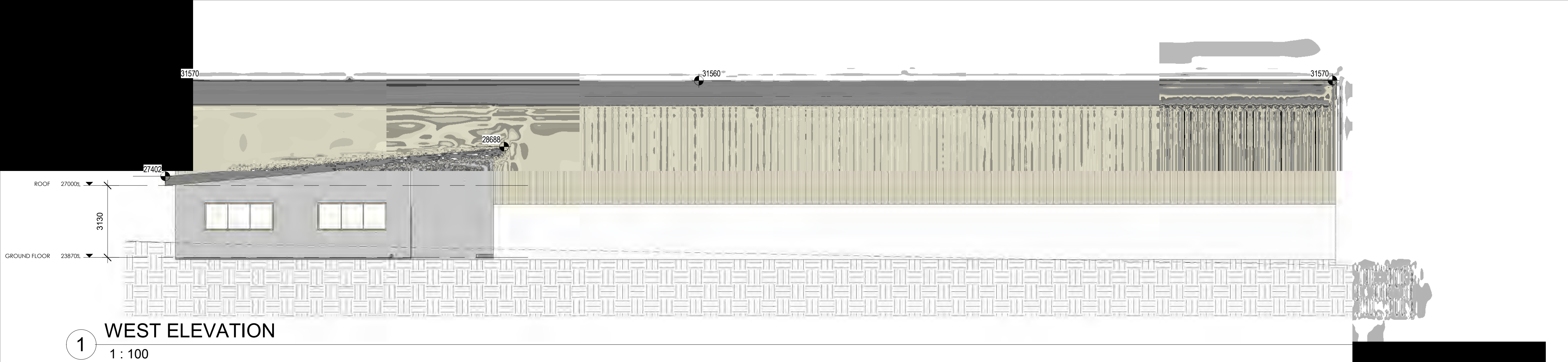
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PROJECT TITLE PROPOSED RESOURCE MANAGEMENT FACILITY 99 SARGENTS ROAD, EBENEZER NSW 2756			
DRAWING TITLE GROUND FLOOR PLAN			
PROJECT NUMBER 19083	DRAWING NUMBER 02	DATE 03/01/19	REVISION B
SCALE @ A1 As indicated	DRAWN BY FM	CHECKED BY CB	

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A	CONCEPT PLANS	01/03/19	CB
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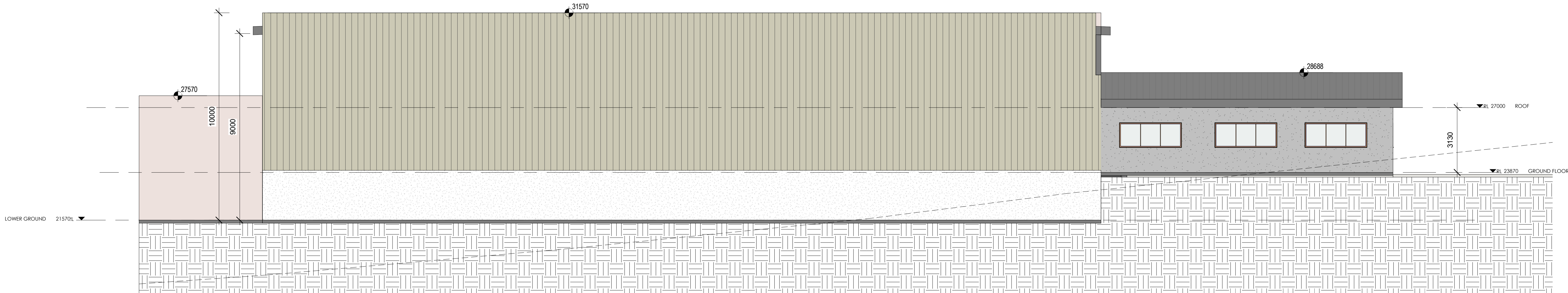
PROJECT TITLE
**PROPOSED RESOURCE MANAGEMENT FACILITY
99 SARGENTS ROAD, EBENEZER NSW 2756**

DRAWING TITLE
EAST AND WEST ELEVATIONS

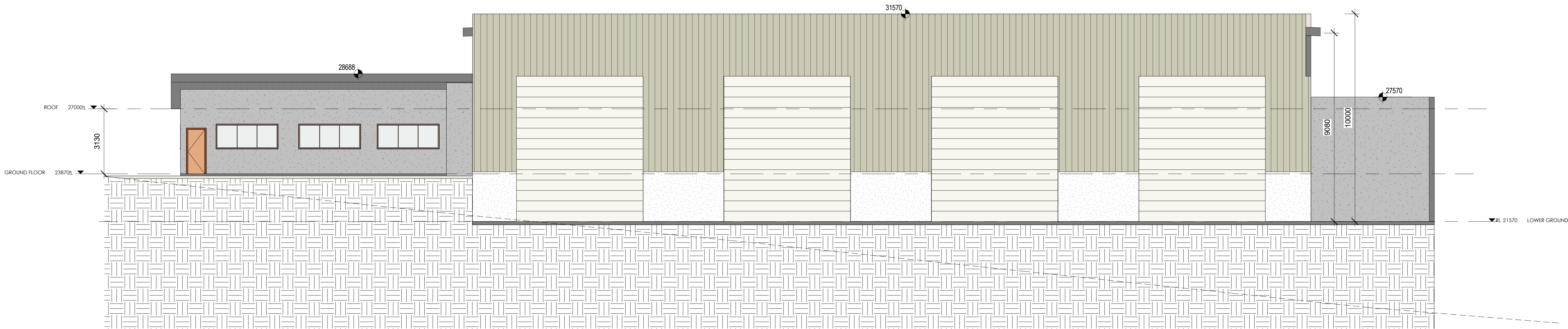
PROJECT NUMBER	DRAWING NUMBER	DATE	REVISION
19083	03	06/14/19	B
	SCALE @ A1 1 : 100	DRAWN BY FM	CHECKED BY CB

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FOR DA APPROVAL



1 NORTH ELEVATION
1 : 100



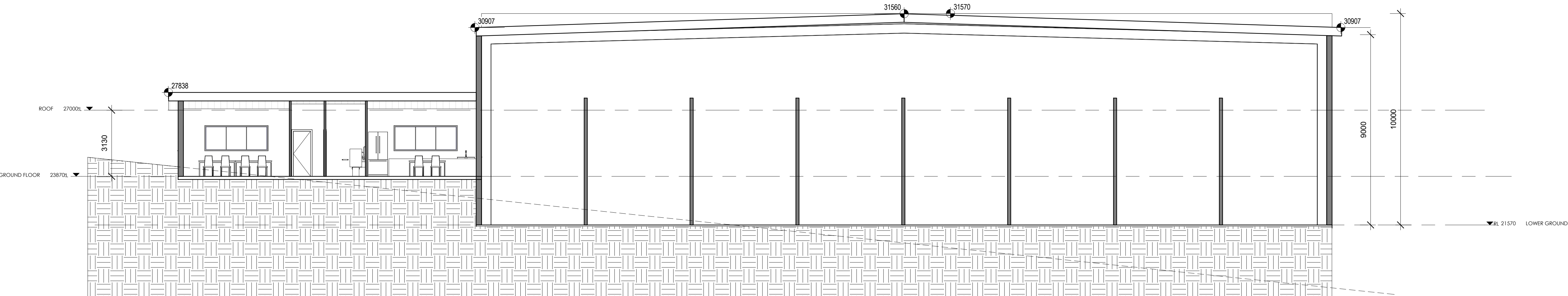
2 SOUTH ELEVATION
1 : 100

REV	DESCRIPTION	DATE	BY
A	CONCEPT PLANS	01/03/19	CB
B	ISSUED FOR DA	07/08/19	CB

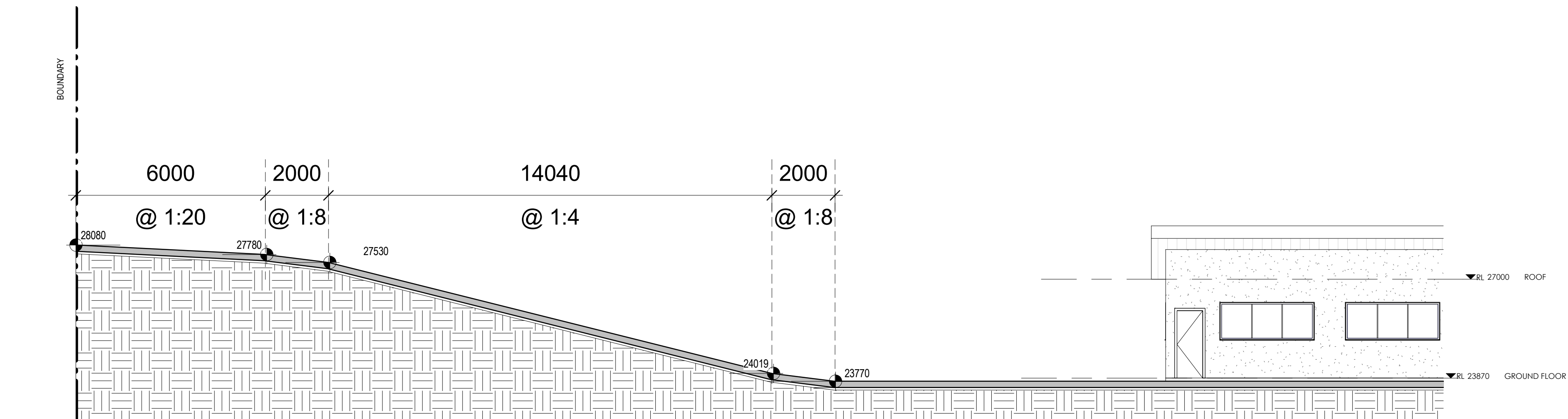
FOR DA APPROVAL

PROJECT TITLE			
PROPOSED RESOURCE MANAGEMENT FACILITY 99 SARGENTS ROAD, EBENEZER NSW 2756			
DRAWING TITLE			
NORTH & SOUTH ELEVATION			
PROJECT NUMBER	DRAWING NUMBER	DATE	REVISION
19083	04	06/14/19	B
SCALE @ A1 1 : 100	DRAWN BY FM	CHECKED BY CB	

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2 SECTION A-A
1 : 100



1 DRIVEWAY SECTION
1 : 100

REV	DESCRIPTION	DATE	BY
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DRAWING TITLE
SECTIONS

PROJECT NUMBER	DRAWING NUMBER	DATE	REVISION
19083	05	08/02/19	B
SCALE @ A1 1 : 100	DRAWN BY FM	CHECKED BY CB	

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SCHEDULE OF MATERIALS AND FINISHES SUBJECT TO AVAILABILITY

REFERENCE	ELEMENT	MATERIAL	FINISH / SPECIFICATION
01	EXTERNAL WALL	RENDER	DULUX CREAM OR SIMILAR
02	EXTERNAL WALL	COLORBOND CLADDING	COLORBOND PALE EUCALYPT OR SIMILAR
03	WINDOWS	GLASS SET IN POWDER COATED ALUMINIUM FRAME	DULUX APO GREY OR SIMILAR
04	SLIDING DOOR	GLASS SET IN POWDER COATED ALUMINIUM FRAME	DULUX APO GREY OR SIMILAR
05	ROOF	ROOF	COLORBOND DUNE OR SIMILAR
06	GUTTERS & DOWN PIPES	ALUMINIUM	COLORBOND DUNE OR SIMILAR
07	DRIVEWAY	CONCRETE	CONCRETE OR SIMILAR

REV	DESCRIPTION	DATE	BY

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99 SARGENTS ROAD, EBENEZER NSW 2756

DRAWING TITLE
MATERIALS SCHEDULE

PROJECT NUMBER	DRAWING NUMBER	DATE	REVISION
19083	06	01/31/20	
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KEY

STOCK PILE

BUILDING MATERIAL & SOIL STOCKPILE

SEDIMENT EROSION

SKIP BINS

TEMPORARY FENCE

WC

1

SEDIMENTATION PLAN

1 : 300

REV	DESCRIPTION	DATE	BY

FOR DA APPROVAL

BAINI DESIGN

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Parramatta, NSW 2150

Sydney, Australia

Phone + 61 2 9188 8250

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PROJECT TITLE

PROPOSED RESOURCE MANAGEMENT FACILITY

99 SARGENTS ROAD, EBENEZER NSW 2756

DRAWING TITLE

SEDIMENTATION PLAN

PROJECT NUMBER

19083

DRAWING NUMBER

07

SCALE @ A1

1 : 300

DATE

01/31/20

DRAWN BY

FM

REVISION

CHECKED BY

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Document Set ID: 6921736
Version: 4, Version Date: 03/02/2021

EIS Appendix 10: Arborist Implication Assessment



Arboricultural Implication Assessment

Concerning the proposed **RESOURCE RECOVERY FACILITY** at
99 Sargents Road, Ebenezer, NSW

Prepared for



Issue A – 22nd August, 2019 by Victor John Molyneux
B.E.;M.Eng.Sc.;M.B.A.; Diploma Level 5 Arboriculture and Garden Design

Please note: a PDF file of this report is available to by contacting victor@hrcgroup.com.au

Introduction

Report format and content

This Arborist report contains detailed information about site and nearby trees that could be impacted by the proposed site disruptions and to brief all parties, including owners and neighbours as well as professional officers about relevant tree matters.

The Summary Report format and layout has been developed to include all the MANDATORY ARBORIST REPORT REQUIREMENTS specified by Councils and yet be easy to read by a lay-person not familiar with tree jargon.

It is a factual report that includes substantively based recommendations of trees to retain and those to remove. The Tree Management Plan shows the location of trees and provides a practical tree protection specification during the demolition and construction phases of the project, so an additional Arborist Report is not necessarily required after project approval by Council. Some minor amendments based on the Council Conditions of Consent may be required and an Issue B of the Tree Management Plan published once all project details have been finalized.

The entire Arborist investigation and report is summarised in Appendix A - the Tree Management Plan which can be printed out in colour on a A2 sheet for 1:100 scale and/or on a A3 sheet for 1:50 scale. A copy of the PDF wide format printing file of this Tree Management Plan and the site Tree Protection Signs can be obtained by contacting the HRC Group.

Client details

This report is undertaken on behalf of Benbow Environmental 25-27 Sherwood Road, Northmead, NSW.

Arborist Details

The site arboricultural survey and report compilation has been carried out by Victor John Molyneaux, Consulting Arborist with the Horticultural Resources Consulting Group. The HRC Group postal address is PO Box 1020 Eastwood NSW 2122. Telephone number (02) 9874 9888 Fax: (02) 9874 989.

Email contact (preferred) victor@hrcgroup.com.au
mobile number 0410 755 338

Victor John Molyneaux has a Civil Engineering degree and Master's degrees in Science and Business Administration. Victor is a seasoned Arborist physically working with removal of large trees and progressing with his Arboriculture studies through all level of TAFE certification to Diploma Level 5 and migrating to a consulting Arborist role in his senior years. Victor has obtained Level 5 Diploma status in Landscape Design. His extensive engineering background coupled with tree morphology knowledge is valued by project developers and building contractors.

Disclosure of any pecuniary or non-pecuniary interests

Victor John Molyneaux and the HRC Group have no pecuniary or non-pecuniary interests whatsoever in relation to the development other than compiling this report.

The purpose of the report

This Tree Implication Assessment has been compiled to manage the existing trees during the planning, and construction of the proposed Resource Recovery Facility at 99 Sargents Road, Ebenezer, NSW

Tree Data collection

The site trees were inspected on 22nd August, 2019 to verify tree locations, dimensions, health and soil conditions.

There were twenty nine (29) significant trees observed on site that were mostly over five (5) metres and within five (5) metres of the boundary. These trees were numbered as shown in Appendix 1- The Tree Management Plan. A visual tree assessment was undertaken by Arborist, Victor John Molyneaux. All significant trees on site and neighbouring properties were identified and defined with a summary of key measurements and observations summarised in the Shrubs and Tree Measurements and Observations Summary on the Tree Management Plan

More detailed field notes are available if required and pictures of each tree are included in the Level 5 Arborist Tree Measurements and Observation table shown on the Tree Management Plan.

Status

The recommendations of this report are based on several discussions with the Linda Zanotto, Senior Environmental Engineer, Benbow Environmental and Hala Alameddine, a review of the survey plan, the Jala Designs Landscape Plan Issue A 29.07.2019 and the baini design Architectural sheets Revision B 08.02.19.

A detailed EIS has been prepared and Council has requested that the tree species that are proposed to be removed are clearly identified. Accordingly an Arboricultural Impact Assessment (AIA) and Tree Protection Plan prepared by an AQF Level 5 arborist to support the project documentation and address the site tree issues

The Site

The subject site is limited to a 2 hectare area of the 15 hectare property site which is situated on vacant land currently used for horse grazing.

The site has an AHD elevation of about 28 to 13 metres, sloping east with no observed areas of water pooling. Average annual rainfall for the localized area is adequate for medium sized trees estimated as being about 850 mm per annum.

Soils

Soils of this immediate area are typical of the GyMEA Soil Landscape Group (as classified in the Soil Landscapes of the Sydney 1:100,000 Sheet), consisting of shallow to moderately deep yellow earth and sands – a Hawkesbury Sandstone outcrop area.

These local soils are known for their high erosion potential, shallow highly permeable soil with very low soil fertility.

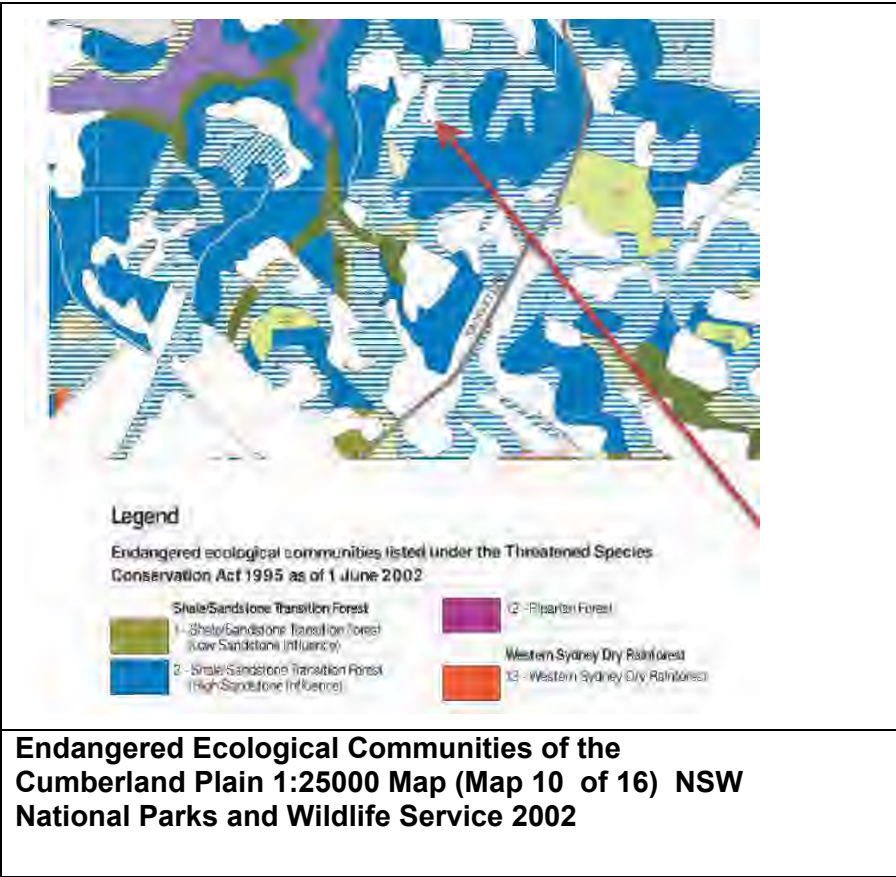
This site can therefore sustain large native trees with good soils and adequate rainfall

The Original Vegetation

The original vegetation of this area consisted of a Shale/Sandstone Transitional Forest with High Sandstone influence. The dominate tree species being *Eucalyptus punctata*, Grey Gum - noting that significant remnant gums are featured on the site.

It is important to appreciate the indigenous vegetation which proved over millennia to be the appropriate species of the localized area.

There are no endangered ecological communities (EEC) on the site as defined by endangered ecological communities of the Cumberland Plain 1:25000 Map (Map 14 of 16) by NSW National Parks and Wildlife Service 2002. The site is not considered to be “Urban Bushland” but the neighbouring lots feature dense bushland.



The proposed Landscape Plant Schedule specifies

enduring natives. These are considered sustainable provided they are established with supplemental irrigation and mulching.

TREES CATEGORY RATINGS and recommended outcomes

#	Botanical Name/ Common Name	CATEGORY/ RECOMMENDATION
1	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
2	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY B MEDIUM RETAIN and PROTECT
3	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW REMOVE Poor specimen – unsightly, no amenity value
4	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
5	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
6	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
7	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW REMOVE Not sustainable
8	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
9	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM REMOVE Not sustainable
10	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW REMOVE Not sustainable
11	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM REMOVE Not sustainable
12	<i>Acacia melanoxylon</i> Blackwood	CATEGORY B MEDIUM REMOVE Not sustainable
13	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM REMOVE Not sustainable
14	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW REMOVE Not sustainable
15	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT

16	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
17	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
18	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW REMOVE Not sustainable
19	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM REMOVE Not sustainable
20	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
21	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH REMOVE Not sustainable
22	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
23	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT
24	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
25	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
26	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
27	<i>Eucalyptus crebra</i> , narrow leaved ironbark	CATEGORY B MEDIUM RETAIN and PROTECT
28	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
29	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT

Recommendations

Recommendation 1

Remove Tree Numbers; T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T16, T17, T18, T19, T20, and T21 for the stated reasons to accommodate the proposed development.

Recommendation 2

To proceed with the proposed development layout and execute the Tree Management Plan.

#	Botanical Name/ Common Name	CATEGORY/ RECOMMENDATION
1	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
2	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY B MEDIUM RETAIN and PROTECT
3	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW Poor specimen unsightly, no amenity value
4	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
5	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
6	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
7	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
8	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
9	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
10	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW Not sustainable
11	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
12	<i>Acacia melanoxylon</i> Blackwood	CATEGORY B MEDIUM Not sustainable
13	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
14	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
15	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT
16	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
17	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
18	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
19	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
20	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
21	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
22	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
23	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT
24	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
25	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
26	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
27	<i>Eucalyptus crebra</i> , narrow leaved ironbark	CATEGORY B MEDIUM RETAIN and PROTECT
28	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
29	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT

STRICTLY ENFORCED

TREE PROTECTION ZONE

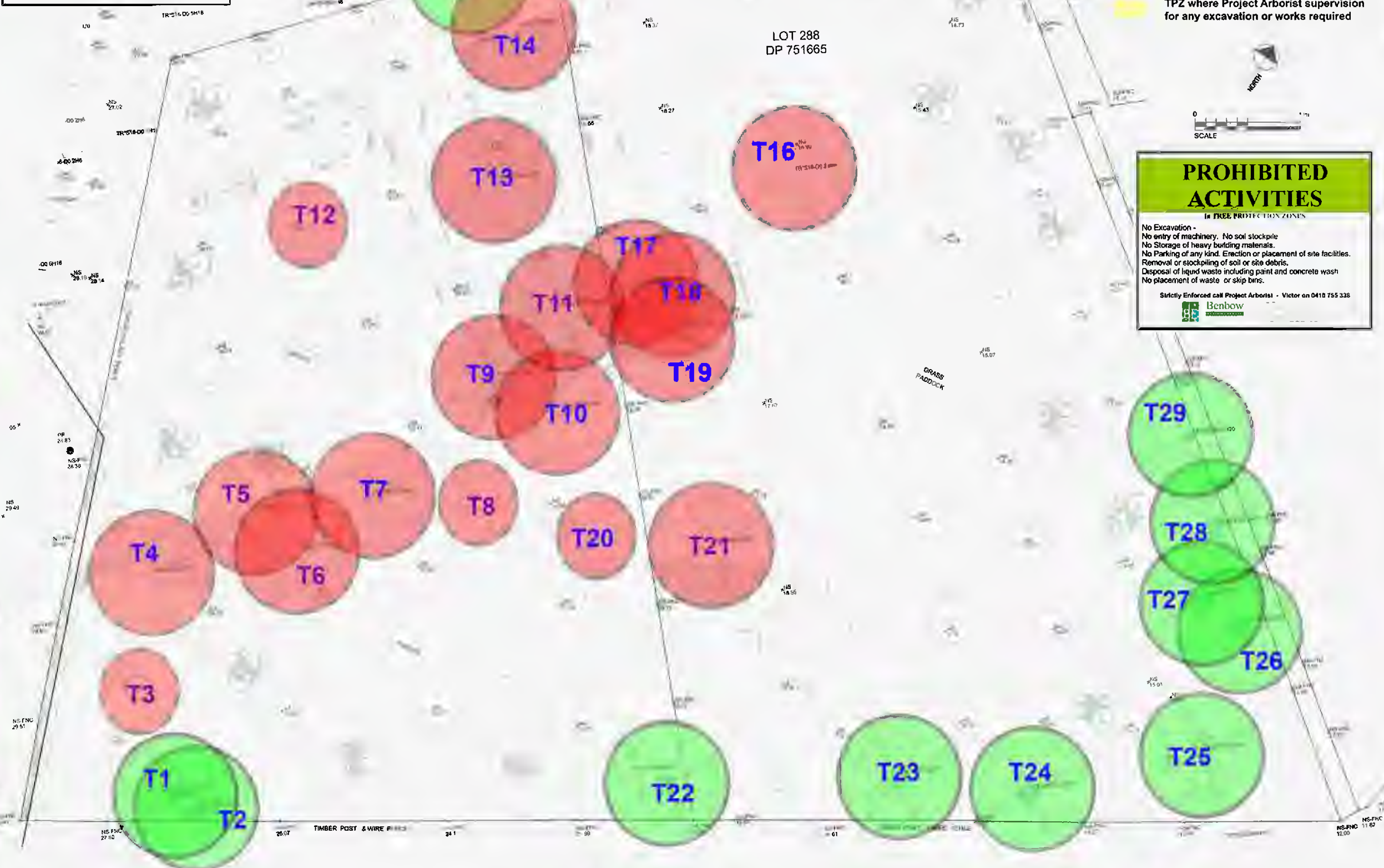
Eucalyptus punctata (Gray Gum)

**NO MATERIALS TO BE STORED WITHIN
FIVE (5) METRES OF THIS TREE**

Appointed Consultant Arborist

Victor John Molyneux victor@hrcgroup.com.au
B.E. (Horticulture), N.S.W. (L) & F. Horticulture
Horticultural Resources Consulting Group
t: 08 9476 6440 f: 08 955 3363 e: info@hrcgroup.com.au

 **Benbow** CONSTRUCTION



 **Trees to be removed in Red**

 **Trees to be retained in Green**

 **Tree Protection Zone boundary (TPZ)**

 **Tree Protection fence**

TPZ where Project Arborist supervision for any excavation or works required

- No Excavation -
- No entry of machinery. No soil stockpile
- No Storage of heavy building materials.
- No Parking of any kind. Erection or placement of site facilities.
- Removal or stockpiling of soil or site debris.
- Disposal of liquid waste including paint and concrete wash
- No placement of waste or skip bins.

Strictly Enforced call Protect Arboresal - Victor on 0410 755 338

 Benbow

Benbow

Englische Sprachlehre: Part: für die Zwanzigste

 Benbow Environmental

OWNER
Hala Constructions Pty Ltd

LGA	Hawkesbury City Council

Horticultural Resources Consulting Group
PO Box 1020 Eastwood NSW 2122
Tel: (02) 9874 9888 Fax: (02) 9874 9899

Contact: Victor@hrcgroup.com.au Mobil 0410 755 338

DWG TITLE

TREE MANAGEMENT PLAN

PROJECT TITLE

PROPOSED RESOURCE RECOVERY FACILITY
at 99 Sargents Road, Ebenezer, NSW.

APPENDIX 1

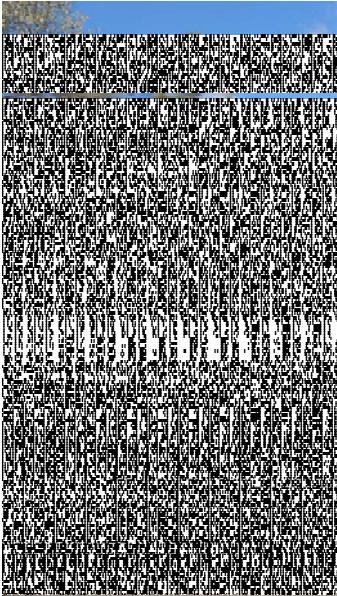
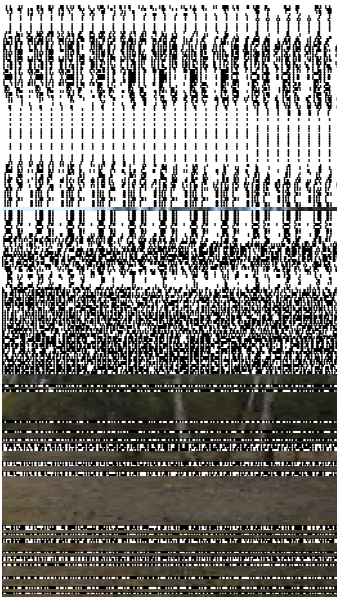
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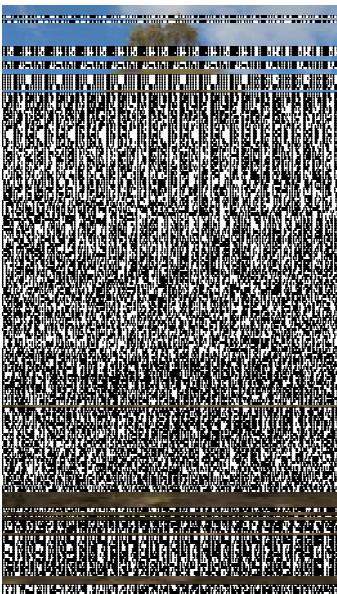
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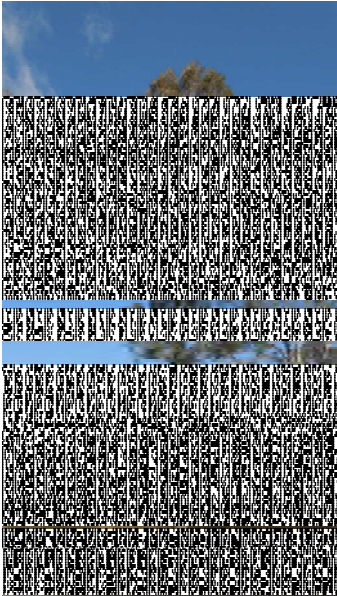
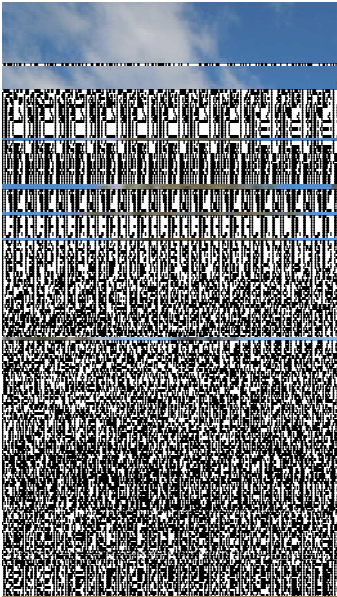
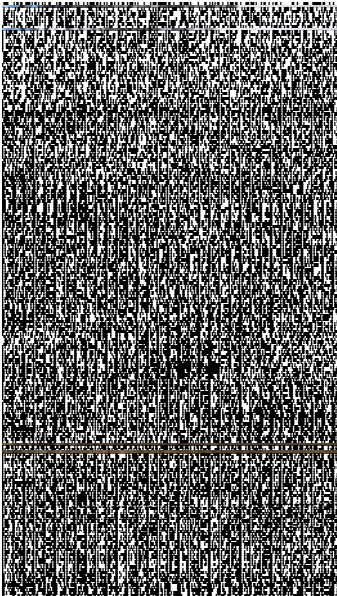
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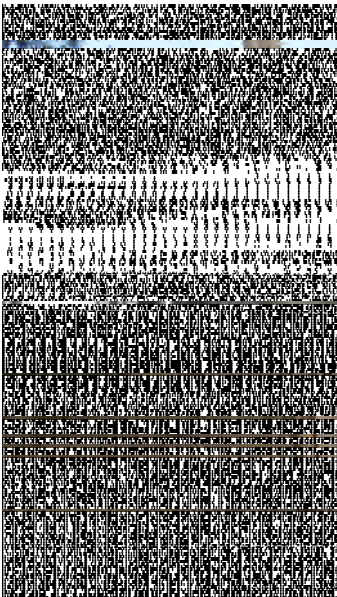
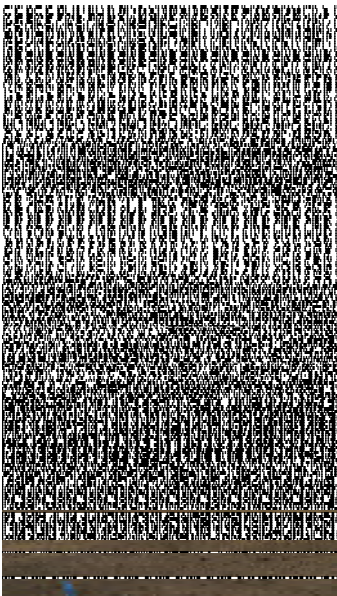
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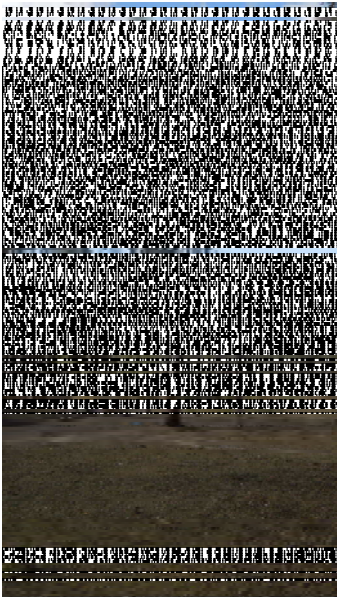
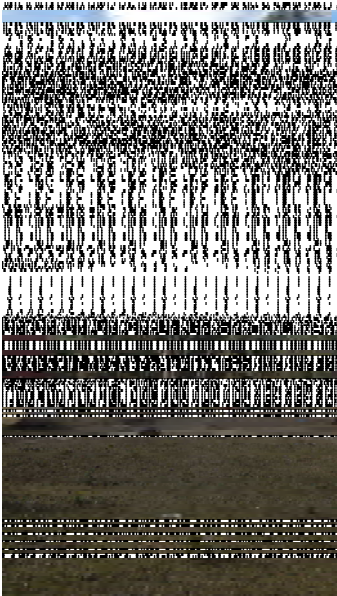
Table 1 Arborist TREES MEASUREMENTS, Pictures and OBSERVATIONS SUMMARY **SITE 99 S**

#	Botanical Name/ Common Name	DBH mm	Height spread N- S- E- W M	Picture	Biological health Mechanical health	Comment and existing site implications
1	<i>Eucalyptus punctata</i> , Grey Gum	590	18 M High 6X6 Mature		Good Health Form Asymmetric to west Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT
2	<i>Eucalyptus signata</i> Scribbly Gum	490	18 M High 5X5 Mature		Good Health Asymmetric to east Healthy and stable Good foliage density and colour pleasing cluster with four Acacia shrubs	Well away from proposed disruption RETAIN and PROTECT

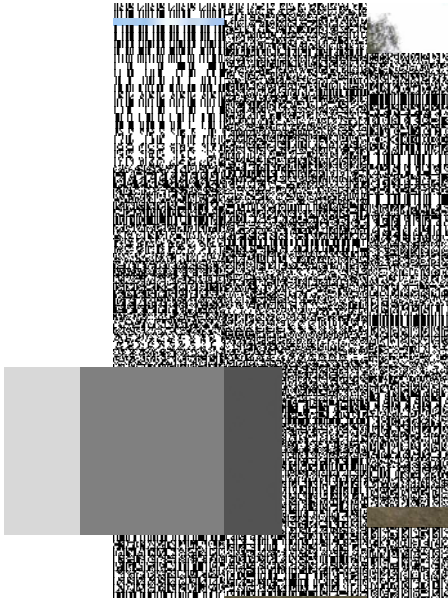
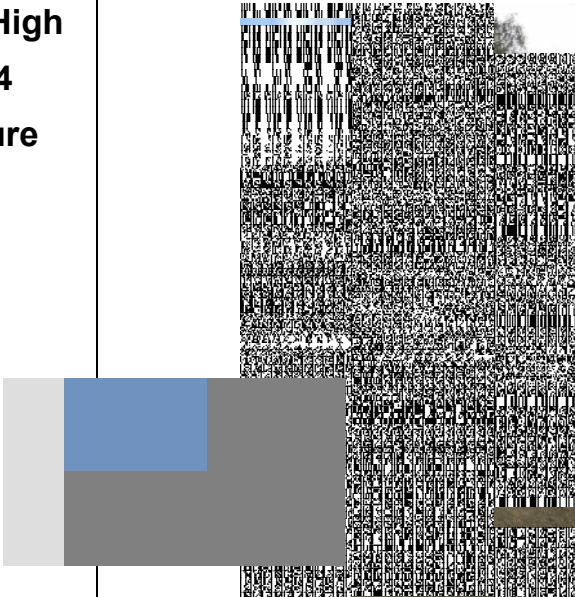
3	<i>Acacia melanoxylon</i> Blackwood	550	12 M High N8 S4 E5 W4 Mature		Poor Health Poor Form Asymmetric to east Split in trunk - unstable Poor foliage density and colour This tree is at the end of its useful life	Poor specimen – unsightly no amenity value REMOVE
4	<i>Eucalyptus punctata</i> , Grey Gum	560	24 M High 5X5 Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - driveway and excavation REMOVE
5	<i>Eucalyptus punctata</i> , Grey Gum	570	18 M High 4X4 Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - driveway and excavation REMOVE

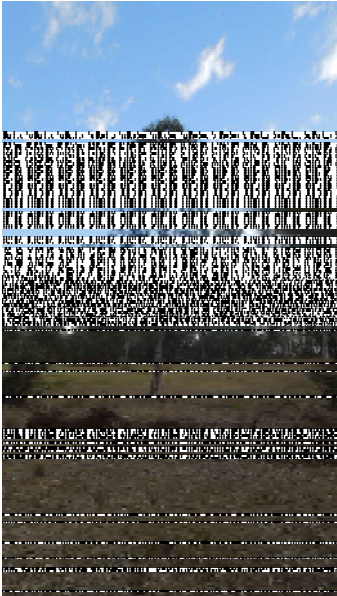
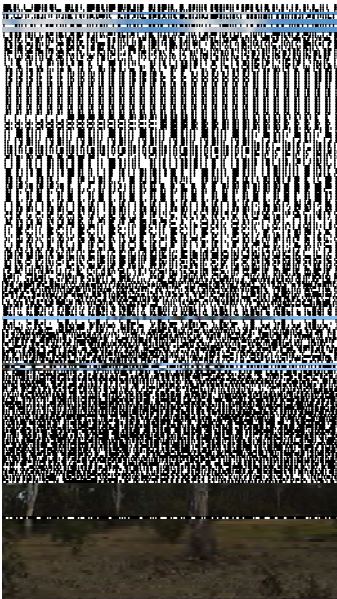
6	<i>Eucalyptus punctata</i> , Grey Gum	710	30 M High 4X4 Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - driveway and excavation REMOVE
7	<i>Eucalyptus punctata</i> , Grey Gum	540	20 M High 4X4 Mature		Lost major secondary trunk – split with storm damage Good Health Good Form Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - driveway and excavation REMOVE
8	<i>Eucalyptus punctata</i> , Grey Gum	410	8 M High 4X4 Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - driveway and excavation REMOVE

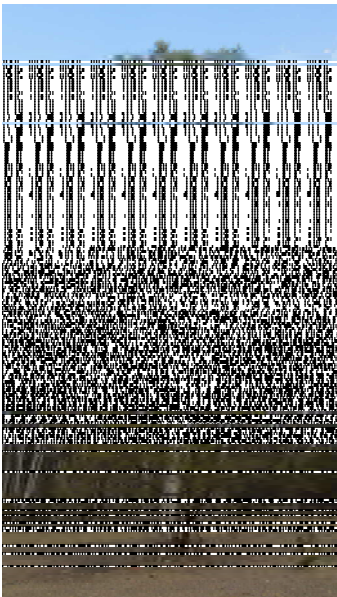
9	<i>Eucalyptus punctata</i> , Grey Gum	590/ 530	28 M High 7X7 Mature		Horse damage to cambium Co-dominate symmetric Healthy and stable Good foliage density and colour pleasing form High skirt	Not sustainable with proposed development footprint - building footprint and excavation REMOVE
10	<i>Acacia melanoxydon</i> Blackwood	410	9 M High 3X3 Mature		Poor Health Poor Form Mistletoe infestation	Not sustainable with proposed development footprint - building footprint and excavation REMOVE
11	<i>Eucalyptus punctata</i> , Grey Gum	440/ 560	28 M High 7X7 Mature		Horse damage to cambium Co-dominate symmetric Healthy and stable Good foliage density and colour pleasing form Low skirt	Not sustainable with proposed development footprint - building footprint and excavation REMOVE

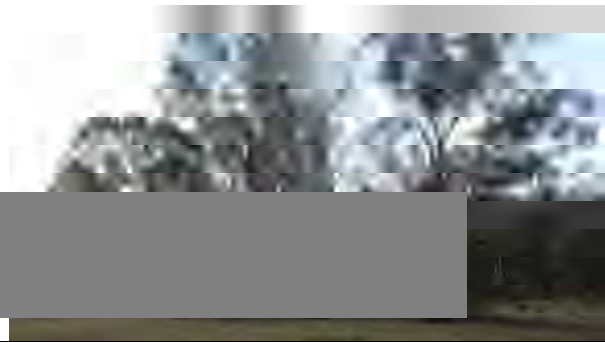
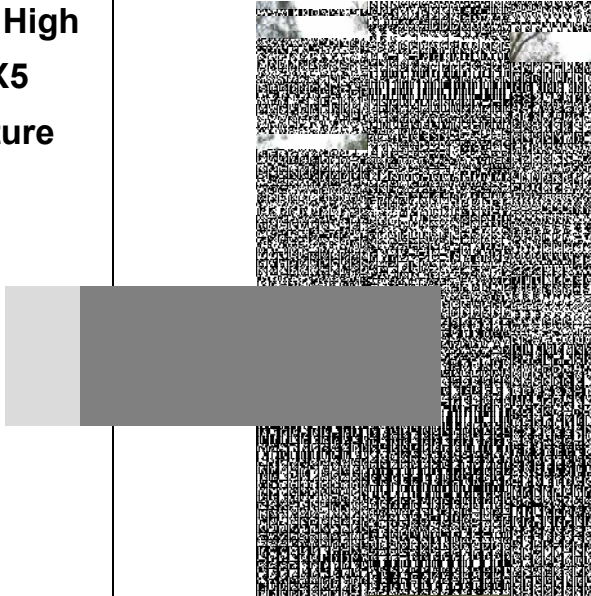
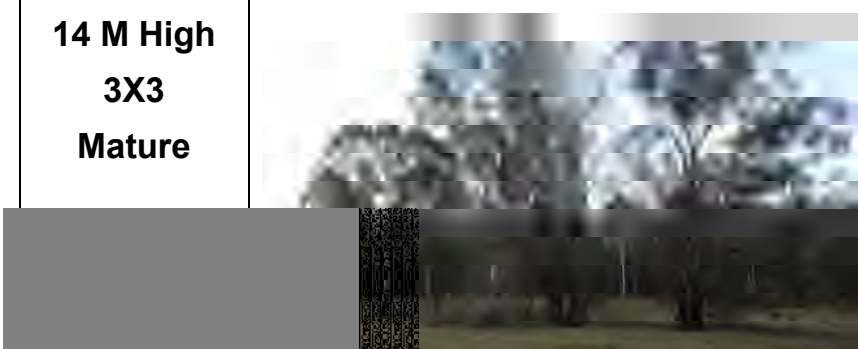
12	<i>Acacia melanoxylon</i> Blackwood	130-180 7 trunks mallie form	8 M High 4X4 Mature		Good Health Poor Form Symmetric Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - building footprint and excavation REMOVE
13	<i>Eucalyptus punctata</i> , Grey Gum	1170	32 M High 7X7 Mature		Horse damage to cambium Co-dominate symmetric Healthy and stable Good foliage density and colour pleasing form High skirt	Not sustainable with proposed development footprint - proposed operations platform area and major excavation REMOVE
14	<i>Eucalyptus punctata</i> , Grey Gum	520/ 720	24 M High 5X5 Mature		Horse damage to cambium Co-dominate – crack and decay in base symmetric Poor structural stability Good foliage density and colour but poor form and structure	Not sustainable with proposed development footprint - proposed operations platform area and major excavation REMOVE

15	<i>Eucalyptus punctata</i> , Grey Gum	460/ 490	18 M High 5X5 Mature		Co-dominate good Health Symmetric Healthy and stable Good foliage density and colour pleasing form.	Sustainable RETAIN and PROTECT
16	<i>Eucalyptus punctata</i> , Grey Gum	500/ 750	18 M High 6X7W Mature		Co-dominate good Health Symmetric Healthy and stable Good foliage density and colour pleasing form. High Skirt	Not sustainable with proposed development footprint with proposed excavation - fill area REMOVE
17	<i>Eucalyptus punctata</i> , Grey Gum	520	12 M High 5X5 Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - proposed operations platform area and major excavation REMOVE

18	<i>Eucalyptus punctata</i> , Grey Gum	430	16 M High 5X5 Mature		Horse damage to cambium symmetric Good foliage density and colour but poor form Low skirt	Not sustainable with proposed development footprint - proposed operations platform area and major excavation REMOVE
19	<i>Eucalyptus punctata</i> , Grey Gum	400/ 370	13 M High 4X4 Mature		Co-dominate good Health Symmetric Healthy and stable Good foliage density and colour pleasing form. Intertwined with insignificant Acacia	Not sustainable with proposed development footprint with proposed excavation - fill area REMOVE

20	<i>Eucalyptus punctata</i> , Grey Gum	180	7 M High 3X3 Semi-Mature		Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - proposed operations platform area and major excavation REMOVE
21	<i>Eucalyptus punctata</i> , Grey Gum	920	28 M High 6X6 Mature		Co-dominate Good Health Good Form Healthy and stable Good foliage density and colour pleasing form.	Not sustainable with proposed development footprint - proposed materials bay area REMOVE
22	<i>Eucalyptus punctata</i> , Grey Gum	540	18 M High 6X6 Mature		Horse damage to cambium Co-dominate – no crack or decay in base symmetric Good structural stability Good foliage density, colour and form	Sustainable RETAIN and PROTECT

23	<i>Eucalyptus punctata</i> , Grey Gum	960	22 M High 6X6 Mature		Tri-dominate good Health Symmetric Healthy and stable Good foliage density and colour pleasing form.	Sustainable RETAIN and PROTECT
24	<i>Eucalyptus signata</i> Scribbly Gum	620	22 M High 8X8 Mature		Good Health Symmetric Healthy and stable Good foliage density and colour pleasing cluster with Acacia shrub	Well away from proposed disruption RETAIN and PROTECT
25	<i>Eucalyptus signata</i> Scribbly Gum	610	18 M High 8X8 Mature		Has a matured sucker Good Health Interesting feature form Asymmetric to west Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT

26	<i>Eucalyptus punctata</i> , Grey Gum	630	12 M High 4X4 Mature		Struggling Health - decay and fungus attack as base but OK Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT
27	<i>Eucalyptus crebra</i> , narrow leaved ironbark	390	12 M High 5X5 Mature		Good Health and Form Symmetric with some deadwood – typical of species Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT
28	<i>Eucalyptus punctata</i> , Grey Gum	670	22 M High 4X4 Mature		Failed branch on ground Still good Health Good Form Symmetric Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT
29	<i>Eucalyptus punctata</i> , Grey Gum	570	14 M High 3X3 Mature		Good Health and Form Symmetric t Healthy and stable Good foliage density and colour pleasing form.	Well away from proposed disruption RETAIN and PROTECT

#	Botanical Name/ Common Name	CATEGORY/ RECOMMENDATION
1	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
2	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY B MEDIUM RETAIN and PROTECT
3	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW Poor specimen unsightly, no amenity value
4	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
5	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
6	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
7	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
8	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
9	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
10	<i>Acacia melanoxylon</i> Blackwood	CATEGORY C LOW Not sustainable
11	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
12	<i>Acacia melanoxylon</i> Blackwood	CATEGORY B MEDIUM Not sustainable
13	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
14	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
15	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT
16	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
17	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
18	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW Not sustainable
19	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM Not sustainable
20	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
21	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH Not sustainable
22	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY B MEDIUM RETAIN and PROTECT
23	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT
24	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
25	<i>Eucalyptus signata</i> Scribbly Gum	CATEGORY A HIGH RETAIN and PROTECT
26	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
27	<i>Eucalyptus crebra</i> , narrow leaved ironbark	CATEGORY B MEDIUM RETAIN and PROTECT
28	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY C LOW RETAIN and PROTECT
29	<i>Eucalyptus punctata</i> , Grey Gum	CATEGORY A HIGH RETAIN and PROTECT

[illegible]

Trees to be removed in Red

Trees to be retained in Green

Tree Protection Zone boundary (TPZ)

Tree Protection fence

TPZ where Project Arborist supervision or any excavation or works required

No Excavation -
No entry of machinery. No soil stockpile
No Storage of heavy building materials.
No Parking of any kind. Erection or placement of site facilities.
Removal or stockpiling of soil or site debris.
Disposal of liquid waste including paint and concrete wash
No placement of waste or skip bins.

Strictly Enforced call Project Arborist - Victor on 0410 755 338

 Benbow
Environmental

EIS Appendix 11: Biodiversity Development Assessment Report



NARLA
environmental

Biodiversity Development Assessment Report (Streamlined Assessment)

99 Sargents Road, Ebenezer, NSW, 2756

Report prepared for Benbow Environmental

April 2020



NARLA

environmental

Report:	Biodiversity Development Assessment Report (Streamlined Assessment)
Prepared for:	Benbow Environmental
Prepared by:	Narla Environmental Pty Ltd
Project no:	Benb1
Date:	March 2020
Version:	Final

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Any survey of flora and fauna will be unavoidably constrained in a number of respects. In an effort to mitigate those constraints, we applied the precautionary principle described in the methodology section of this report to develop our conclusions. Our conclusions are not therefore based solely upon conditions encountered at the site at the time of the survey. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Narla Environmental has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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Narla Environmental Pty Ltd
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Report Certification

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Document Control

Revision	Document Name	Date	Internal Document Review	Approved for Issue
Draft v1.0	Biodiversity Development Assessment Report (BDAR) (Streamlined Assessment) for 99 Sargents Road, Ebenezer, NSW	19/03/2020	Jack Tatler Alexander Graham	Alexander Graham



Alexander Graham *BSc*
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Accredited Biodiversity Assessor (BAAS19040)
Narla Environmental Pty Ltd



Table of Contents

1. Introduction	10
1.1 Overview	10
1.2 The Proposed Development	10
1.3 Site Location and Description	10
1.4 Sources of Information Used	13
1.5 Aim and Approach	13
2. Landscape Features	15
2.1 IBRA bioregion and subregion	15
2.2 Topography, geology and soils	15
2.3 Hydrology	15
3. Native Vegetation	20
3.1 Plant Community Types (PCT) Identified within the Subject Land	20
3.1.1 PCT Selection Process	20
3.1.2 Final PCT and Vegetation Zone Selection	25
3.1.3 Vegetation Integrity Survey (VIS) Plots	29
3.1.3.1 Determining future vegetation integrity scores	30
3.2 Assessing Patch Size	30
4. Threatened Species	32
4.1 Candidate Ecosystem Credit Species	32
4.2 Candidate Species Credit Species Summary	34
4.3 Targeted Species Credit Surveys	42
4.3.1 Fauna Species Credit Survey	42
4.3.2 Flora Species Credit Survey	42
4.4 Species Polygons	43
5. Avoid and Minimise Impacts	44
5.1 Impact Mitigation and Minimisation Measures	44
6. Impact Summary	47
6.1 Impacts on Native Vegetation	47
6.2 Impacts on Threatened Species	47
6.3 Serious and Irreversible Impacts (SAII's)	47
6.4 Other Impacts	48
6.4.1 Indirect Impacts	48
6.4.2 Prescribed and Uncertain Impacts	55
6.5 Biodiversity Offset Credit Requirements	57
6.5.1 Offset Requirement for Ecosystem Credits	57

6.5.2 Offset Requirement for Species Credits.....	57
7. References	58
8. Appendices	60

Figures

Figure 1. The location of the Subject Property and Subject Land.	11
Figure 2. The location of the Subject Land within the locality.....	12
Figure 3. IBRA Bioregion and Subregion of the Subject Property, and within a 1500m buffer.	16
Figure 4. Acid sulfate soil risk occurring within the 1500m buffer.....	17
Figure 5. Watercourses and riparian buffer zones occurring within and adjacent to the Subject Land.	18
Figure 6. Rivers and streams (with associated riparian buffers) occurring within the 1500m buffer.....	19
Figure 7. Narla field validated vegetation mapping within the Subject Land.	28
Figure 8. The extent of patch size and habitat connectivity occurring within and surrounding the 1500m buffer.	31

Tables

Table 1. Area limits for application of small area development threshold on land not shaded on the biodiversity values map. Dark border indicates clearing threshold relevant to this report.....	10
Table 2. PCT Selection Criteria. Dark border indicates the selected PCT.....	21
Table 3. Vegetation identified within the Subject Land: PCT 1081	25
Table 4. Vegetation integrity scores for each identified zone.	29
Table 5. Management Zones within the Subject Land, and the relevant vegetation attributes (composition, structure and function) affecting future VI scores (as per NSW Rural Fire Service 2019).	30
Table 6. Candidate ecosystem credits predicted to occur within the Subject Land.	32
Table 7. Candidate Fauna Credit Species predicted to occur within the Subject Land.....	34
Table 8. Candidate Flora Credit Species predicted to occur within the Subject Land	38
Table 9. Weather conditions taken from the nearest weather stations (Station number 067105) in the lead up and during the field survey (BOM 2020a). Survey dates are in bold.	42
Table 10. Species credit flora species requiring targeted surveys. Targeted surveys were conducted within DPIE endorsed survey periods.	43
Table 11. Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the project.....	44
Table 12. Indirect impacts associated with the proposed development.	48
Table 13. Prescribed and uncertain impacts associated with the proposed development.....	55
Table 14. Ecosystem credits required to offset the proposed development.	57

Plates

Plate 1. Representative photo of Vegetation Zone 1 (Remnant Canopy) within the Subject Land.....	27
Plate 2. Representative photo of Vegetation Zone 2 (Cleared) within the Subject Land.	27

Glossary

Acronym/ Term	Definition
Accredited Biodiversity Assessor	Individuals accredited by the Department of Planning, Industry and Environment (DPIE) to apply the Biodiversity Assessment Method.
BAM	The NSW Biodiversity Assessment Method
BAMC	The NSW Biodiversity Assessment Method Calculator
BC Act	New South Wales Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified.
Biodiversity Offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity from the impacts of development.
Biodiversity values	The composition, structure and function of ecosystems, including threatened species, populations and ecological communities, and their habitats.
BOS	NSW Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
DA	Development Application
DPIE	NSW Department of Planning, Industry and Environment (formerly OEH)
Ecosystem credit	The class of biodiversity credit that relates to a vegetation type and the threatened species that are reliably predicted by that vegetation type (as a habitat surrogate).
EEC	Endangered Ecological Community
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ha	Hectare
HTE	High Threat Exotic
km	Kilometre
LGA	Local Government Area
Locality	The area within a 10km radius of the Subject Land. The same meaning when describing a local population of a species or local occurrence of an ecological community.
m	metres
MNES	Matters of National Environmental Significance
Native Vegetation	Means any of the following types of plants native to New South Wales:(a) trees (including any sapling or shrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland.
NSW	The State of New South Wales
OEH	Office of Environment and Heritage (now DPIE)
PCT	NSW Plant Community Type
Proposal	The development, activity or action proposed.
SAII	Serious and Irreversible Impacts
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
SEPP	State Environmental Planning Policy

Acronym/ Term	Definition
Species credit	The class of biodiversity credit that relate to threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject Land	The footprint of the proposed development.
Subject Property	99 Sargents Road, Ebenezer (Lot 288/DP751665)
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016.
TPZ	Tree Protection Zone: A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development
VIS Plot	Vegetation Integrity Survey Plot

Executive Summary

Narla Environmental Pty Ltd was commissioned by Benbow Environmental to prepare this Biodiversity Development Assessment Report (BDAR) to accompany a Development Application (DA) for the proposed development at 99 Sargents Road, Ebenezer (Lot 288/DP751665). This BDAR was produced using the 'Streamlined Assessment Module' as it does not exceed the area clearing threshold for small area developments as outlined in the Biodiversity Assessment Method (OEH 2017a).

This BDAR has been prepared by Narla Environmental Pty Ltd to identify the potential impacts of the proposed development on biodiversity values. This assessment has been completed in accordance with the Biodiversity Assessment Method (BAM) Appendix 12.

The proposed development includes a resource management facility and its associated APZ (hereafter referred to as the 'Subject Land'), covering an area of approximately 1.55 ha. The proposed development has been purposefully designed to minimise impacts on biodiversity values, as it has been positioned within historically cleared land that contains scattered canopy trees. The Subject Land is currently used for grazing and contains low biodiversity values.

The proposed development is expected to impact one (1) Plant Community Type (PCT): 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion. Six (6) ecosystem credits for PCT 1081 are to be offset in order to mitigate the impacts upon biodiversity as a result of the proposed development. No candidate species credit species will require offsetting.

In order to avoid and minimise potential impacts of the proposal on local biodiversity values, a series of mitigation and management measures have been identified, which are to be implemented as part of any Construction Environmental Management Plan (CEMP) produced for the site. This includes assigning a Project Ecologist to undertake an extensive pre-clearing survey, and to supervise the clearing of all vegetation in relation to the proposed development.



1. Introduction

1.1 Overview

Narla Environmental Pty Ltd (Narla) was commissioned by Benbow Environmental ('the proponent') to prepare this BDAR to accompany a DA for the proposed development at 99 Sargents Road, Ebenezer (Lot 288/DP751665; hereafter referred to as the 'Subject Property').

The development is subject to DA approval and has triggered the Biodiversity Offset Scheme (BOS) as the amount of native vegetation to be cleared exceeds the area threshold as set out in Section 7.2 of the Biodiversity Conservation Regulation 2017. This BDAR will be prepared as a 'Streamlined assessment module - small area development that requires consent' as it does not exceed the area clearing threshold for small area developments as outlined in the BAM (OEH 2017a; **Table 1**).

Narla have produced this report in order to assess any potential impacts associated with the DA and recommend appropriate measures to mitigate any potential ecological impacts in line with the requirements of the Consent Authority, Hawkesbury City Council.

Table 1. Area limits for application of small area development threshold on land not shaded on the biodiversity values map. Dark border indicates clearing threshold relevant to this report.

Minimum lot size associated with the property	Maximum area limit for application of the small area development module
Less than 1ha	≤1ha
Less than 40ha but not less than 1ha	≤2ha
Less than 1000ha but not less than 40ha	≤5ha
1000ha or more	≤10ha

1.2 The Proposed Development

The Subject Land is centrally located within the Subject Property and is defined by the development footprint of a proposed resource management facility and its associated Asset Protection Zone (APZ; **Figure 1**). The Subject Land covers an area of approximately 1.55 ha, comprising cleared paddocks with scattered canopy trees. The development of the resource management facility will encompass 1.2 ha within the Subject Land, requiring the removal of all vegetation to allow for the proposed buildings and hard surfaces. The remaining 0.35 ha within the Subject Land will be managed as an Inner Protection Area (IPA) as per the requirements outlined in NSW Rural Fire Service (2019).

1.3 Site Location and Description

The Subject Property is situated in the suburb of Ebenezer, covering an area of approximately 15 ha within the Hawkesbury Local Government Area (LGA; **Figure 2**). The Subject Property is situated within a semi-rural landscape and is comprised of cleared paddocks with canopy trees scattered throughout. An area of bushland exists within the south of the Subject Land, which connects to vegetated corridors in the broader landscape.



Figure 1. The location of the Subject Property and Subject Land.



Figure 2. The location of the Subject Land within the locality.

1.4 Sources of Information Used

A thorough literature review was undertaken to gain an insight into the ecology and applicable legislation within the locality and the Hawkesbury LGA, including:

- Relevant State and Commonwealth Databases & Datasets:
 - NSW BioNet. The website of the Atlas of NSW Wildlife (OEH 2020a)
 - NSW BioNet. Threatened Biodiversity Data Collection (OEH 2020b)
 - NSW BioNet. Vegetation Classification System (OEH 2020c)
 - NSW Government Spatial Services: Six Maps Clip & Ship
- Vegetation and Soil Mapping:
 - Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands (Tozer et al. 2010)
 - Soil Landscapes of the Sydney 1:100 000 Sheet (Chapman & Murphy 1989)
- NSW State Guidelines:
 - Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE 2019a)
 - Biodiversity Assessment Method Calculator Version 1.2.7.2 (DPIE 2019b)
 - Biodiversity Offsets and Agreement Management System (BOAMS)
 - NSW Guideline to Surveying Threatened Plants (OEH 2016)
 - Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004)
- Council Documents:
 - Hawkesbury Development Control Plan (DCP) 2002
 - Hawkesbury Local Environment Plan (LEP) 2012

Preparation of this BDAR also involved the review of the following accompanying project documents:

- Architectural Plans: Proposed Resource Management Facility – 99 Sargents Road, Ebenezer (Baini Design 2019)
- Bush Fire Assessment Report: 99 Sargents Road Ebenezer (Bushfire Consulting Services 2019)
- Landscape Plan for development application: 99 Sargents Road, Ebenezer, NSW (JALA Designs 2019)

These sources were used to gain an understanding of the natural environment and ecology of the Subject Land and its surrounds. Searches using NSW Wildlife Atlas (BioNet) were conducted to identify current threatened flora and fauna records within and surrounding the Subject Land. These data were used to assist in establishing the presence or likelihood of any biodiversity values as occurring on, or adjacent to, the Subject Land, and helped inform our Ecologist on what to look for during the site assessment.

1.5 Aim and Approach

This report has been prepared in accordance with the BAM (OEH 2017a) and aims to:

- Describe the biodiversity values present within the Subject Land, including the extent of native vegetation, vegetation integrity and the presence of Threatened Ecological Communities (TECs);
- Determine the habitat suitability within the Subject Land for candidate threatened species;
- Prepare an impact assessment in regard to potential impacts of the proposed development on biodiversity values, including potential prescribed impacts and SAILs within the Subject Land;
- Discuss and recommend efforts to avoid and minimise impacts on biodiversity values; and



- Calculate the biodiversity credits (i.e. ecosystem credits and species credits) that measure potential impacts of the development on biodiversity values. This calculation will inform the decision maker (Hawkesbury City Council) as to the number and class of offset credits required to be purchased and retired as a result of the proposed development.



2. Landscape Features

2.1 IBRA bioregion and subregion

The Subject Land occurs within the 'Yengo' Interim Biogeographic Regionalisation 7 (IBRA7) Subregion, which is part of the 'Sydney Basin' IBRA7 Bioregion (**Figure 3**).

2.2 Topography, geology and soils

The Subject Land is mapped as occurring on the Gynea soil landscape, which consists of undulating to rolling rises and low hills on Hawkesbury Sandstone. Soils are shallow to moderately deep (30-100 cm) Yellow Earths and Earthy Sands on crests and inside of benches; shallow (<20 cm) Siliceous Sands on leading edges of benches; localised Gleyed Podzolic Soils and Yellow Podzolic Soils on shale lenses; and shallow to moderately deep (<100 cm) Siliceous Sands and Leached Sands along drainage lines. This soil landscape occurs extensively throughout the Hornsby Plateau and along the foreshores of Sydney Harbour and the Parramatta and Georges Rivers.

The Subject Land did not contain any areas of geological significance, such as karsts, caves, cliffs or crevices. The Subject Land is not mapped as occurring on acid sulfate soils nor mapped as having risk/probability of exhibiting occurrence of acid sulfate soils. Areas exhibiting high and low probability of acid sulfate soils have been mapped within the wider locality (1500m buffer). Areas of high probability extend into the Subject Property from the north, but occupy the lower lying areas exhibiting alluvial processes (**Figure 4**).

2.3 Hydrology

No soaks, drainage lines or mapped watercourses occur within the Subject Land (**Figure 5**). The closest watercourse is a dam situated to the north-east of the Subject Land. The riparian buffer of this dam does not intersect the Subject Land. A number of mapped watercourses occur within the area surrounding the Subject Land. Such watercourses range from 1st order streams to 4th order streams, and are tributaries that form part of the Hawkesbury River Catchment (**Figure 6**).

The Subject Land and the immediate surrounds (within the 1500 m buffer) do not contain any areas of native vegetation identified as 'Coastal Wetlands' as per the State Environmental Planning Policy (Coastal Management) 2018.

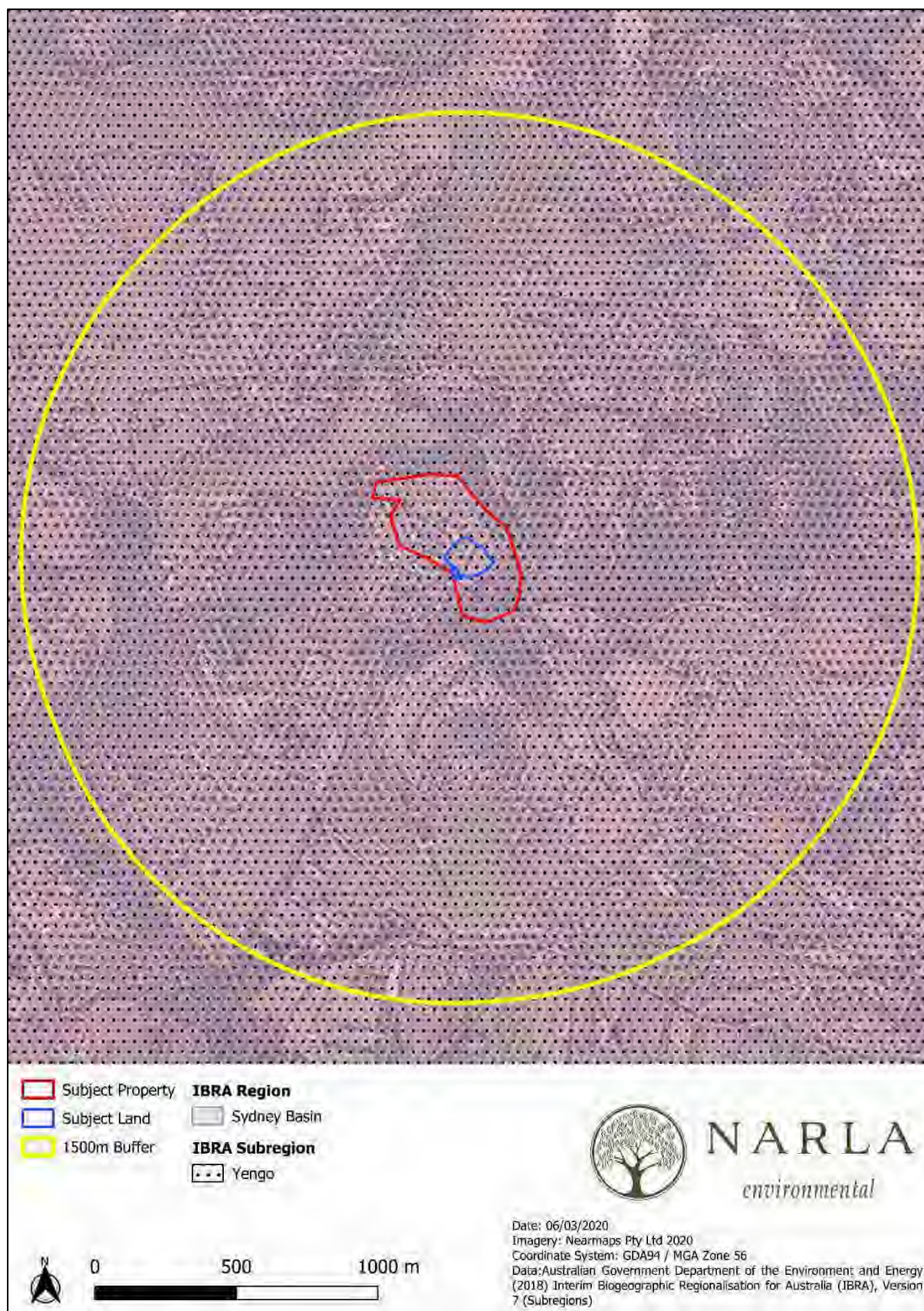


Figure 3. IBRA Bioregion and Subregion of the Subject Property, and within a 1500m buffer.

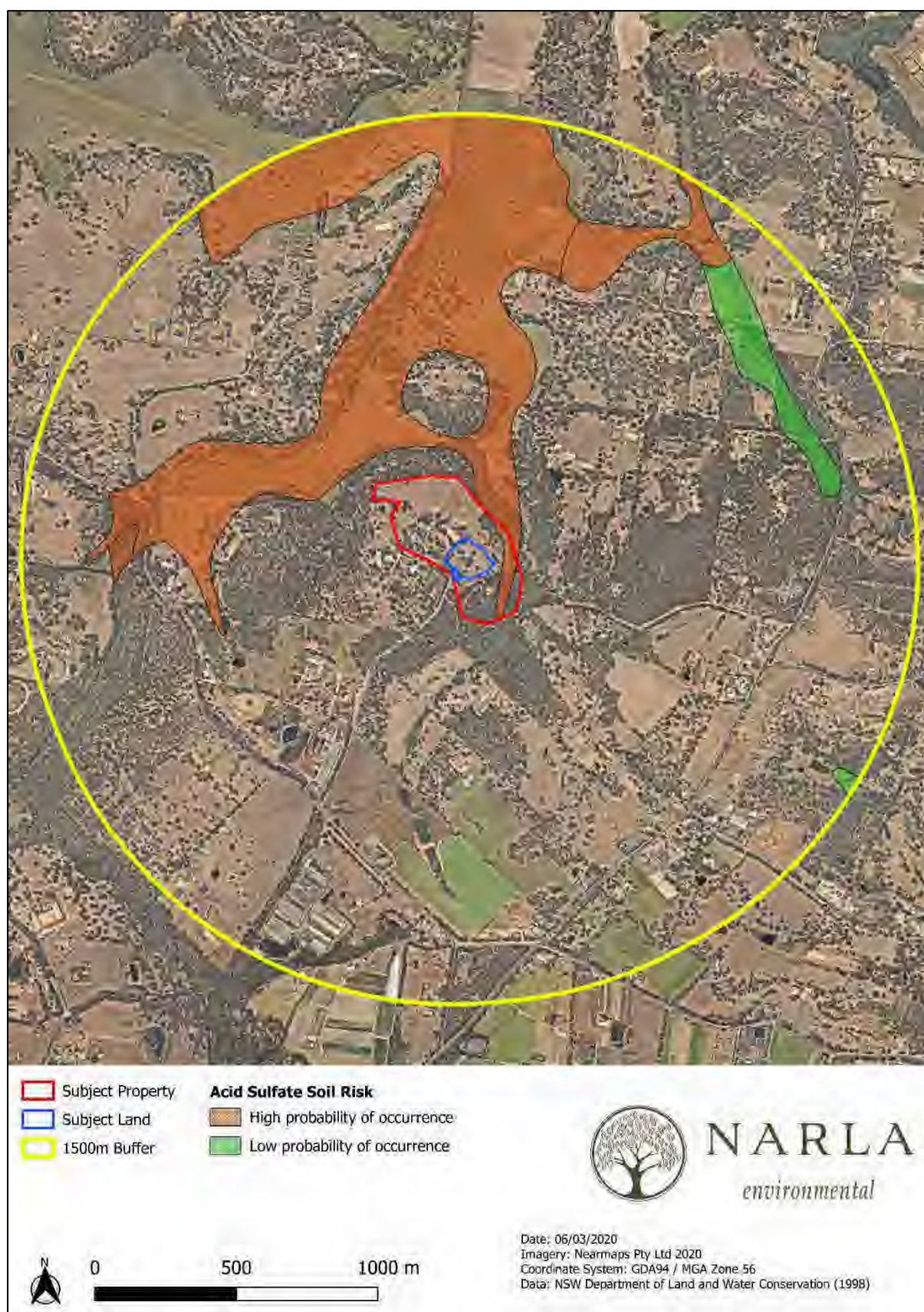


Figure 4. Acid sulfate soil risk occurring within the 1500m buffer.



Figure 5. Watercourses and riparian buffer zones occurring within and adjacent to the Subject Land.

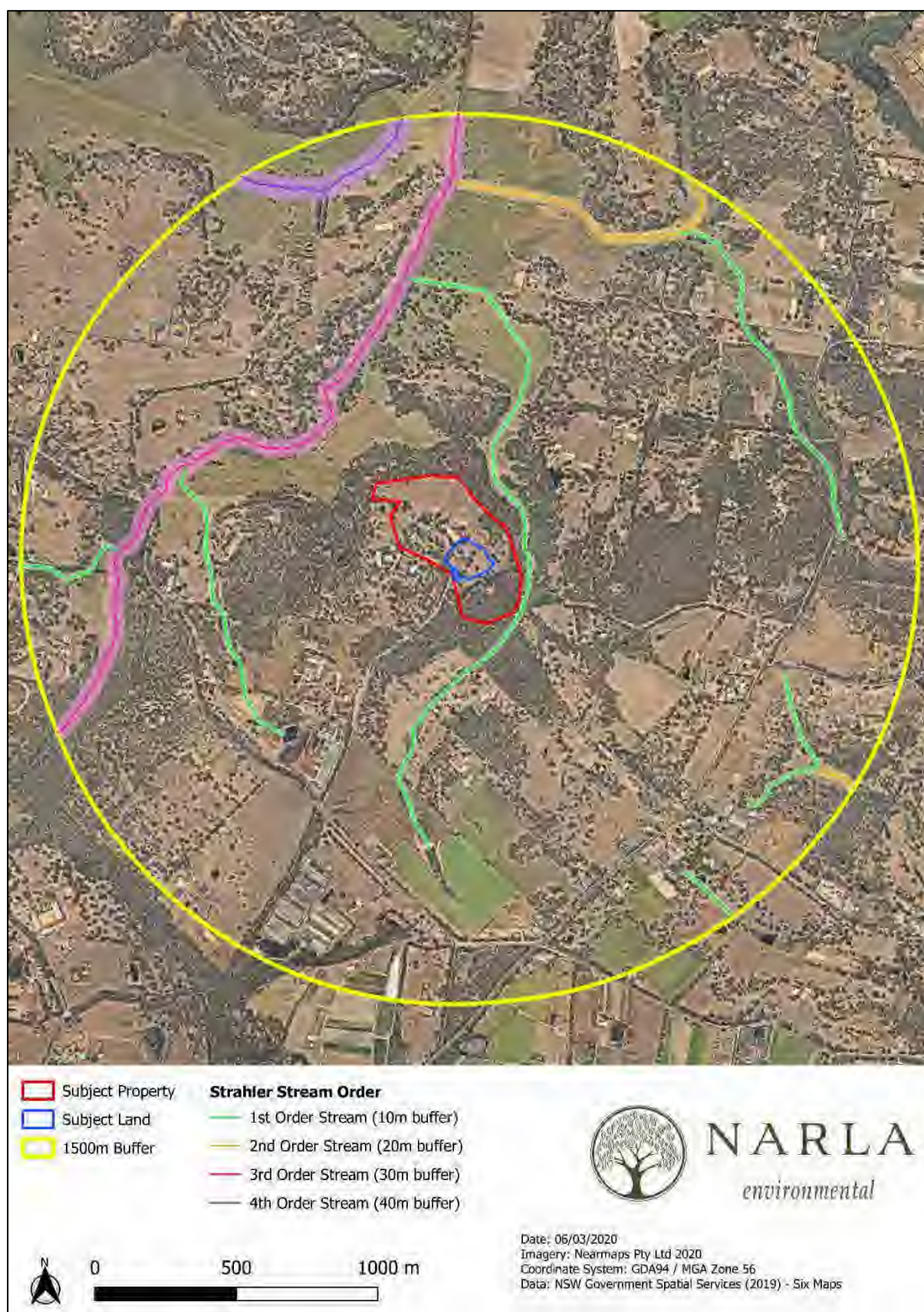


Figure 6. Rivers and streams (with associated riparian buffers) occurring within the 1500m buffer.

3. Native Vegetation

3.1 Plant Community Types (PCT) Identified within the Subject Land

3.1.1 PCT Selection Process

Field surveys conducted by Narla confirmed that one (1) native vegetation community occurred within the Subject Land. Plant Community Type selection for this vegetation community was undertaken using information and databases provided in the BioNet Vegetation Classification System (OEH 2020c). The following selection criteria were used to develop the PCT shortlist:

- IBRA Bioregion: Sydney Basin
- IBRA Subregion: Yengo
- Distribution: Hawkesbury Region
- Dominant Upper Stratum Species: *Eucalyptus punctata*, *Eucalyptus tereticornis*, *Angophora bakeri*, *Corymbia gummifera*

This process delivered a selection of five (5) PCT's that could potentially occur within the Subject Land. Such PCTs contained the highest number of the selected upper stratum species. Based on historical mapping, an additional PCT (PCT 1395) was added to the selection process. The steps taken to justify the presence or absence of each of these PCT's within the Subject Land is provided in **Table 2**. Note that due to the degraded nature of the vegetation within the Subject Land, the adjacent bushland was also used as a guide to determine PCT. It was assumed that such vegetation would have historically occurred within the Subject Land.

Table 2. PCT Selection Criteria. Dark border indicates the selected PCT.

Candidate PCT	Characteristic Canopy	Characteristic Shrub / Groundcover	Landscape Position / Geology	Justification
PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	<i>Corymbia gummifera</i> ; <i>Eucalyptus punctata</i> ; <i>Angophora costata</i> ; <i>Syncarpia glomulifera</i> ; <i>Eucalyptus piperita</i> ; <i>Eucalyptus oblonga</i> ; <i>Eucalyptus sclerophylla</i> .	<i>Phyllanthus hirtellus</i> ; <i>Persoonia linearis</i> ; <i>Leptospermum trinervium</i> ; <i>Acacia ulicifolia</i> ; <i>Persoonia levis</i> ; <i>Acacia linifolia</i> ; <i>Banksia spinulosa</i> ; <i>Pimelea linifolia</i> ; <i>Isopogon anemonifolius</i> ; <i>Dillwynia retorta</i> ; <i>Eriostemon australasius</i> ; <i>Hakea sericea</i> ; <i>Bossiaea heterophylla</i> ; <i>Lambertia formosa</i> ; <i>Platysace linearifolia</i> ; <i>Acacia suaveolens</i> ; <i>Grevillea mucronulata</i> ; <i>Entolasia stricta</i> ; <i>Lomandra obliqua</i> ; <i>Pomax umbellata</i> ; <i>Themeda australis</i> ; <i>Lomandra multiflora</i> ; <i>Lepidosperma laterale</i> ; <i>Dianella revoluta</i> var. <i>revoluta</i> ; <i>Austrostipa pubescens</i> ; <i>Goodenia hederacea</i> ; <i>Cyathochaeta diandra</i> ; <i>Phyllanthus hirtellus</i> ; <i>Xanthorrhoea media</i> ; <i>Lomandra filiformis</i> ; <i>Caustis flexuosa</i> ; <i>Dampiera stricta</i> .	Sydney Hinterland Transition Woodland (DSF p146) encircles the Cumberland Plain rainshadow, on loamy soils typically derived from sediments belonging to the Hawkesbury or Mittagong formations.	Narla have assigned this PCT to the vegetation within the Subject Land. This PCT was chosen as it contained the highest number of characteristic species occurring within and adjacent to the Subject Land. In addition, this PCT matches the geology of the Subject Land, occurring on Hawkesbury Sandstone. A soil profile taken in close proximity to the Subject Land (within the Subject Property) indicates the soil is a 'fine loamy sand' (DPIE 2020b). Loamy soils are a characteristic of this PCT. Further justification is outlined in Table 3 .
PCT 1181 - Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion	<i>Angophora costata</i> ; <i>Corymbia gummifera</i> ; <i>Banksia serrata</i> ; <i>Eucalyptus piperita</i> ; <i>Eucalyptus pilularis</i> ; <i>Eucalyptus punctata</i> ; <i>Syncarpia glomulifera</i> ; <i>Eucalyptus agglomerata</i> .	<i>Persoonia linearis</i> ; <i>Persoonia levis</i> ; <i>Phyllanthus hirtellus</i> ; <i>Leptospermum trinervium</i> ; <i>Lomatia silaifolia</i> ; <i>Banksia spinulosa</i> ; <i>Platysace linearifolia</i> ; <i>Ceratopetalum gummiferum</i> ; <i>Acacia ulicifolia</i> ; <i>Acacia terminalis</i> ; <i>Allocasuarina littoralis</i> ; <i>Xylomelum pyriforme</i> ; <i>Banksia serrata</i> ; <i>Dodonaea triquetra</i> ; <i>Grevillea mucronulata</i> ; <i>Eriostemon australasius</i> ; <i>Entolasia stricta</i> ;	This forest surrounds the Cumberland plain, occurring along the western portion of the Hornsby and Woronora plateaux and in the lower Blue Mountains. Within this distribution Hinterland Sandstone Gully Forest occurs on lower slopes of dry sandstone gullies up to 600m ASL where average annual rainfall ranges from 850 to 1300mm.	This PCT does not fit the vegetation within the Subject Land. Although a number of the species within this PCT were present, a higher number of characteristic species were represented in PCT 1081. Furthermore, the Subject Land does not occur on the Hornsby or Woronora plateaux's, and the average annual rainfall within the

Candidate PCT	Characteristic Canopy	Characteristic Shrub / Groundcover	Landscape Position / Geology	Justification
		<i>Pteridium esculentum</i> ; <i>Dianella caerulea</i> ; <i>Smilax glycyphylla</i> ; <i>Xanthosia pilosa</i> ; <i>Lomandra longifolia</i> ; <i>Lepidosperma laterale</i> ; <i>Lomandra obliqua</i> ; <i>Phyllanthus hirtellus</i> ; <i>Lomandra multiflora</i> ; <i>Lomandra filiformis</i> ; <i>Gonocarpus teucroides</i> ; <i>Pomax umbellata</i> ; <i>Austrostipa pubescens</i> ; <i>Lomandra cylindrica</i> ; <i>Xanthorrhoea arborea</i> .		Subject Land is approximately 720mm (BOM 2020b).
PCT 1255 - Sydney sandstone hinterland dry sclerophyll forests of the Sydney Basin Bioregion	<i>Angophora bakeri</i> ; <i>Corymbia eximia</i> ; <i>Corymbia gummifera</i> ; <i>Eucalyptus punctata</i> ; <i>Eucalyptus sparsifolia</i> ; <i>Eucalyptus sclerophylla</i> ; <i>Angophora costata</i> ; <i>Eucalyptus agglomerata</i> ; <i>Syncarpia glomulifera</i> .	<i>Acacia suaveolens</i> ; <i>Acacia terminalis</i> ; <i>Astrotricha obovata</i> ; <i>Dodonaea triquetra</i> ; <i>Elaeocarpus reticulatus</i> ; <i>Lambertia formosa</i> ; <i>Leptospermum trinervium</i> ; <i>Monotoca scoparia</i> ; <i>Persoonia levis</i> ; <i>Persoonia linearis</i> ; <i>Persoonia oblongata</i> ; <i>Phyllanthus hirtellus</i> ; <i>Platysace lanceolata</i> ; <i>Podolobium ilicifolium</i> ; <i>Pultenaea flexilis</i> ; <i>Pultenaea microphylla</i> ; <i>Anisopogon avenaceus</i> ; <i>Aristida vagans</i> ; <i>Calochlaena dubia</i> ; <i>Caustis flexuosa</i> ; <i>Entolasia stricta</i> ; <i>Lomandra glauca</i> ; <i>Pteridium esculentum</i> .	Sandstone ridges, slopes and gullies.	This PCT does not fit the vegetation within the Subject Land. Although a number of the characteristic canopy species were present within and adjacent to the Subject Land, the Subject Land and surrounds did not contain many of the characteristic shrub and groundcover species that are representative of this PCT. Overall, a higher number of characteristic species were represented in other PCTs.



Candidate PCT	Characteristic Canopy	Characteristic Shrub / Groundcover	Landscape Position / Geology	Justification
PCT 1395 - Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion	<i>Eucalyptus crebra</i> ; <i>Eucalyptus fibrosa</i> ; <i>Allocasuarina littoralis</i> ; <i>Eucalyptus punctata</i> .	<i>Persoonia linearis</i> ; <i>Bursaria spinosa</i> subsp. <i>spinosa</i> ; <i>Ozothamnus diosmifolius</i> ; <i>Hibbertia aspera</i> ; <i>Lepidosperma laterale</i> ; <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> ; <i>Aristida vagans</i> ; <i>Pratia purpurascens</i> ; <i>Microlaena stipoides</i> var. <i>stipoides</i> ; <i>Entolasia stricta</i> ; <i>Lomandra multiflora</i> ; <i>Themeda australis</i> ; <i>Panicum simile</i> ; <i>Echinopogon caespitosus</i> ; <i>Pomax umbellata</i> ; <i>Dichondra repens</i> ; <i>Billardiera scandens</i> ; <i>Opercularia diphylla</i> .	Cumberland Shale-Sandstone Ironbark Forest is found on the fringes of the Cumberland Plain. It is one of a suite of forests that are associated with the subtle intergrade between clay-rich shale soil and the coarse sandy substrates of the sandstone plateau. Within the study area, the forest is restricted to the hinterland where mean annual rainfall is relatively low (800-1000 millimetres) and soils have a distinct clay component. It is most extensively distributed on the western edge of the Woronora Plateau and above the Nepean and Georges rivers between Appin and the Holsworthy defence area.	This PCT does not fit the vegetation within the Subject Land. Although a number of the species within this PCT were present, the distinct lack of ironbarks (<i>Eucalyptus crebra</i> and <i>E. fibrosa</i>) within and adjacent to the Subject Land does not match with the description of this PCT: "Sites invariably have one of two species of ironbark (<i>Eucalyptus crebra</i> or <i>Eucalyptus fibrosa</i>) present". Furthermore, the soils and geology of the Subject Land does not match that of this PCT. This PCT is associated with the intergrade between clay-rich shale soils and the coarse sandy substrates of the sandstone plateau. The Subject Land is situated on the Gynea soil landscape, which occurs on Hawkesbury Sandstone. A soil profile taken in close proximity to the Subject Land (within the Subject Property) indicates the soil is a 'fine loamy sand' (DPIE 2020b).



Candidate PCT	Characteristic Canopy	Characteristic Shrub / Groundcover	Landscape Position / Geology	Justification
PCT 1640 - Yellow Bloodwood - Narrow-leaved Apple heathy woodland on sandstone ranges of the Sydney Basin	<i>Corymbia eximia</i> ; <i>Angophora bakeri</i> ; <i>Eucalyptus punctata</i> .	<i>Leptospermum trinervium</i> ; <i>Persoonia linearis</i> ; <i>Hovea linearis</i> ; <i>Persoonia levis</i> ; <i>Acacia ulicifolia</i> ; <i>Monotoca scoparia</i> ; <i>Acacia linifolia</i> ; <i>Platysace linearifolia</i> ; <i>Lomandra obliqua</i> ; <i>Phyllanthus hirtellus</i> ; <i>Lomandra glauca</i> ; <i>Pomax umbellata</i> ; <i>Dianella revoluta</i> .	Occurring west from a line between Brooklyn and Broke; this community is found on moderately steep, south-facing sandstone hillslopes at altitudes of up to 450m.	This PCT does not fit the vegetation within the Subject Land. Although a number of the species within this PCT were present, a higher number of characteristic species were represented in other PCT's. Furthermore, the Subject Land does not occur on steep, south-facing sandstone hilltops. The Subject Land is situated on a moderate slope that faces north-east.
PCT 1912 - Smooth-barked Apple - Yellow Bloodwood - Grey Gum open forest on sandstone slopes along the Hawkesbury River	<i>Angophora costata</i> ; <i>Eucalyptus punctata</i> ; <i>Eucalyptus umbra</i> ; <i>Corymbia eximia</i> ; <i>Corymbia gummifera</i> .	<i>Allocasuarina littoralis</i> ; <i>Banksia integrifolia</i> ; <i>Allocasuarina torulosa</i> ; <i>Ceratopetalum gummiferum</i> ; <i>Banksia serrata</i> ; <i>Elaeocarpus reticulatus</i> ; <i>Acacia ulicifolia</i> ; <i>Astrotricha floccosa</i> ; <i>Boronia ledifolia</i> ; <i>Grevillea sericea</i> ; <i>Hovea linearis</i> ; <i>Eriostemon australasius</i> ; <i>Dillwynia retorta</i> ; <i>Hibbertia obtusifolia</i> ; <i>Entolasia stricta</i> ; <i>Pteridium esculentum</i> ; <i>Platysace linearifolia</i> ; <i>Anisopogon avenaceus</i> ; <i>Caustis flexuosa</i> ; <i>Patersonia sericea</i> ; <i>Lepidosperma laterale</i> ; <i>Xanthorrhoea arborea</i> .	Hawkesbury River Escarpment Dry Forest occurs on the steep sandstone slopes that overlook the Hawkesbury River and its tributaries. In the study area the forest occurs between two and 80 metres above sea level, spanning lower to upper escarpment slopes. The exposed slopes are underlain by Hawkesbury sandstone, perhaps enriched by thin shale lenses within the bedrock that are only revealed in the deeply dissected valley. Mean annual rainfall is between 1000 and 1200 millimetres. The forest is extensively distributed westwards along the river as far as Warragamba Dam near Penrith and the junction with both the Colo and Macdonald rivers.	This PCT does not fit the vegetation within the Subject Land. Although a number of the species within this PCT were present, a higher number of characteristic species were represented in other PCT's. Furthermore, the Subject Land does not occur on steep sandstone slopes that overlook the Hawkesbury River. In addition, the average annual rainfall within the Subject Land is too low, at approximately 720mm (BOM 2020b).



3.1.2 Final PCT and Vegetation Zone Selection

Field surveys conducted by Narla confirmed that one (1) PCT was identified within the Subject Land:

- PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion

Two vegetation zones were identified within the Subject Land that consisted of differing condition classes:

- Zone 1: PCT 1081 – Remnant Canopy
- Zone 2: PCT 1081 – Cleared

These vegetation zones are detailed in **Table 3** and displayed in **Figure 7**.

Table 3. Vegetation identified within the Subject Land: PCT 1081

PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion		
Vegetation class	Sydney Hinterland Dry Sclerophyll Forest	
Total area (ha)	1.55 ha	
Description in VIS		
Sydney Hinterland Transition Woodland (DSF p146) is a eucalypt woodland with an open understorey of sclerophyll shrubs, sedges, forbs and grasses. This transition woodland encircles the Cumberland Plain rain shadow, on loamy soils typically derived from sediments belonging to the Hawkesbury or Mittagong formations. About one-third of Sydney Hinterland Transition Woodland's original distribution has been cleared, and clearing continues in localised areas of suburban expansion including Dural-Maroota, the lower Blue Mountains and east of Campbelltown. However, considerable areas are represented within conservation reserves.		
Condition Class	Vegetation Zone 1: Remnant Canopy	Vegetation Zone 2: Cleared
Extent within Subject Land (approximate)	0.55 ha	1 ha
Field survey effort	A site assessment was conducted on 18 th February 2020. One (1) BAM plot was established.	A site assessment was conducted on 18 th February 2020. One (1) BAM plot was established.
Description of vegetation	This vegetation zone is comprised of a native canopy layer, an absent shrub layer, and a mixed native/exotic ground layer (Plate 1). The dominant species within this zone include <i>Eucalyptus punctata</i> and <i>Eucalyptus tereticornis</i> . This vegetation zone is mostly situated within an existing paddock that is subject to intense grazing. It was evident that the groundlayer species were regenerating following recent rainfall after an extended dry period.	This vegetation zone is comprised of a mixed native/exotic groundlayer, a sparse assemblage of shrubs and a completely absent canopy (Plate 2). The lack of species diversity within this zone was quite apparent. It was evident that this zone had been historically cleared and subject to intense grazing. The groundlayer species were regenerating following recent rainfall after an extended dry period. Species included <i>Digitaria didactyla</i> , <i>Sida rhombifolia</i> and <i>Malva</i> sp.

PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion

Structure of vegetation	A moderate canopy cover was evident within the BAM plot, with native trees totally 40% cover. No shrubs were present. Ground cover was sparse, which included 15% native grass cover and 1.2% native forb cover. A sparse cover of leaf litter (14% cover) was also apparent. The BAM plot contained a large diversity of tree stem sizes, with tree stems recorded in all but one DBH class. One hollow bearing tree was also recorded within the BAM plot. No fallen logs were recorded. The native vegetation within the BAM plot was dominated by grasses (65.1% cover) and forbs (0.2% cover). The absence of trees was evident within the plot, with only one (1) small stem recorded (<5cm DBH). Minimal native shrub cover was present within the plot (1% cover). A low cover of leaf litter (2% cover) within the plot is attributed to the absence of canopy trees. No hollow bearing trees were located within the BAM plot. No fallen logs were recorded.	
Justification of PCT Assignment	Characteristic Canopy Species	Characteristic canopy species of PCT 1081 within the Subject Land (as per Tozer et al. 2010) include <i>Eucalyptus punctata</i> . Additional characteristic canopy species adjacent to the Subject Land include <i>Angophora bakeri</i> and <i>Corymbia gummifera</i> .
	Characteristic Shrub and Groundcover Species	Midstorey and shrub species characteristic of this PCT within the Subject Land (as per Tozer et al. 2010) include <i>Kunzea ambigua</i> . Additional characteristic shrub and groundcover species adjacent to the Subject Land include <i>Acacia ulicifolia</i> , <i>Allocasuarina littoralis</i> , <i>Entolasia stricta</i> , <i>Glycine clandestina</i> , <i>Leptospermum trinervium</i> , <i>Lomandra multiflora</i> , <i>Persoonia linearis</i> , <i>Philothea hispidula</i> , <i>Pomax umbellata</i> and <i>Themeda triandra</i> .
	Geology and Landscape Position	Sydney Hinterland Transition Woodland (DSF p146) encircles the Cumberland Plain rain shadow, on loamy soils typically derived from sediments belonging to the Hawkesbury or Mittagong formations. The Subject Land is situated on Hawkesbury Sandstone, specifically occurring on the Gynea soil landscape. In addition, a soil profile taken in close proximity to the Subject Land (within the Subject Property) indicates the soil is a 'fine loamy sand' (DPIE 2020b). Loamy soils are a characteristic feature of this PCT.
Scientific Reference from VIS (OEH 2020c)	Tozer, M.G., Turner, K., Simpson, C., Keith, D.A., Beukers, P., MacKenzie, B., Tindall, D. & Pennay, C., 2010 Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Version 1.0	
TEC Status (Biodiversity Conservation Act 2016)	Not listed	
TEC area (ha)	Not applicable	
Estimate of percent cleared value of PCT in the major catchment area	40.00 %	



Plate 1. Representative photo of Vegetation Zone 1 (Remnant Canopy) within the Subject Land.



Plate 2. Representative photo of Vegetation Zone 2 (Cleared) within the Subject Land.



Figure 7. Narla field validated vegetation mapping within the Subject Land.

3.1.3 Vegetation Integrity Survey (VIS) Plots

Two (2) Biodiversity Assessment Method (BAM) Vegetation Integrity Survey (VIS) Plots were undertaken within the Subject Land. Plot data gathered for each attribute used to assess the function of the Subject Land vegetation is detailed in **Appendix A**. Vegetation Integrity (VI) Scores represented by existing vegetation within each vegetation zone is detailed in **Table 4**.

Table 4. Vegetation integrity scores for each identified zone.

PCT	Vegetation Zone	Management Zone	Area (ha)	Survey Effort	Composition Condition Score	Structure Condition Score	Function Condition Score	VI Score	Future VI Score	Change in VI Score	Total change in VI score	Hollow bearing trees
PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	Zone 1 (Remnant Canopy)	1.1 Total Impact	0.40	One 1000m ² (20m x 50m) Vegetation Integrity Survey Plot	11.2	48.2	59.4	31.7	0	-31.7	-30.7	Present
		1.2 IPA	0.15						3.9	-27.9		
	Zone 2 (Cleared)	2.1 Cleared	1.00	One 1000m ² (20m x 50m) Vegetation Integrity Survey Plot	3.6	16.8	15	9.7	N/A	N/A	N/A	Absent

3.1.3.1 Determining future vegetation integrity scores

Most projects will result in complete clearing of vegetation and threatened species habitat within the development footprint. In this scenario, the assessor must assess the proposed future value of each of the VI attributes as zero in the BAMC. However, in circumstances where partial clearing of vegetation is proposed and remaining vegetation will be maintained (i.e. not degraded further over time), the assessor may determine that the future value of the relevant VI attributes are greater than zero (DPIE 2019c).

The Subject Land will be exposed to varying degrees of clearing due to the location of the proposed development and the requirement for an APZ. Subsequently, Vegetation Zone 1 has been divided into two (2) management zones to account for the varying clearing levels (**Figure 7**). The attributes influencing future vegetation scores are detailed in **Table 5**.

Future VI scores do not need to be determined for Vegetation Zone 2. According to Section 3.1.1.3 of the BAM, where a vegetation zone has a vegetation integrity score <17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, then for that vegetation zone, assessment of native vegetation is not required beyond Section 5.4.

Table 5. Management Zones within the Subject Land, and the relevant vegetation attributes (composition, structure and function) affecting future VI scores (as per NSW Rural Fire Service 2019).

Management Zone	Changes in current vegetation attributes	Vegetation attributes not changed
Zone 1.1 Total Impact	All vegetation will be removed	N/A
Zone 1.2 IPA (Inner Protection Zone)	- Reduction in species composition. - Reduction in canopy cover to 14.9% - Removal of regenerating stems <5cm DBH. - Reduction in stem size classes. - Removal of all large trees. - Removal of all leaf litter and coarse woody debris. - Removal of all HTE's.	No change in grass and forb cover.

3.2 Assessing Patch Size

Patch size is defined by the BAM as 'an area of native vegetation that:

- occurs on the development site or biodiversity stewardship site, and
- includes native vegetation that has a gap of less than 100m from the next area of moderate to good condition native vegetation (or ≤30m for non-woody ecosystems)

Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site' (OEH 2017a).

Patch size was calculated according to the above guidelines, and equated to >100 ha.

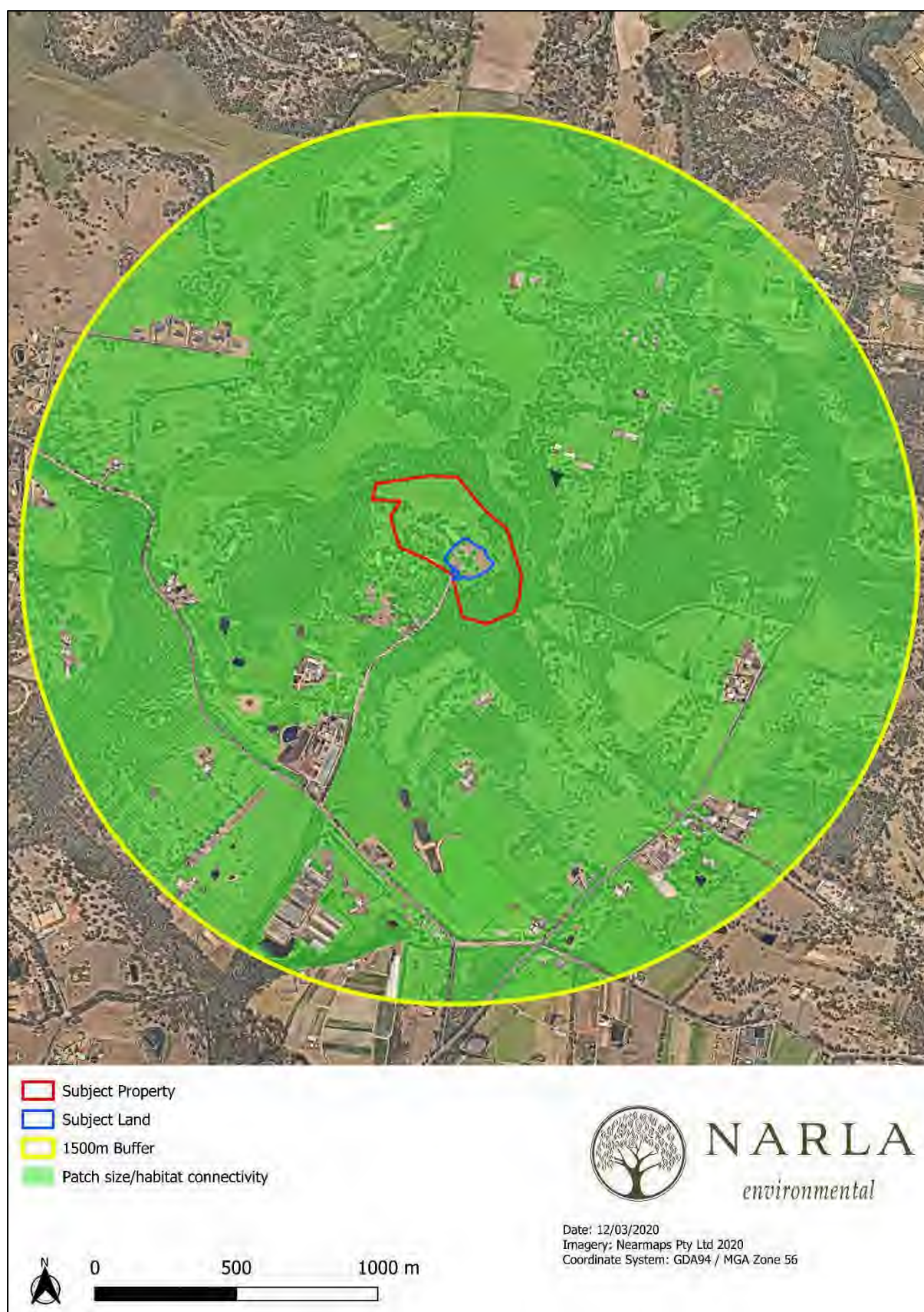


Figure 8. The extent of patch size and habitat connectivity occurring within and surrounding the 1500m buffer.

4. Threatened Species

4.1 Candidate Ecosystem Credit Species

Ecosystem credit species associated with the Subject Land are listed below in **Table 6**. No species predicted by the BAM calculator as potential ecosystem credits were excluded from the results displayed.

Table 6. Candidate ecosystem credits predicted to occur within the Subject Land.

Scientific Name	BC Act Status	Excluded from Assessment	Reason for Exclusion from Assessment
<i>Anthochaera phrygia</i> Regent Honeyeater (Foraging)	Critically Endangered	No	-
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Vulnerable	No	-
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Foraging)	Vulnerable	No	-
<i>Calyptorhynchus lathamii</i> Glossy Black-Cockatoo (Foraging)	Vulnerable	No	-
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies)	Vulnerable	No	-
<i>Daphoenositta chrysoptera</i> Varied Sittella	Vulnerable	No	-
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Vulnerable	No	-
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	Vulnerable	No	-
<i>Glossopsitta pusilla</i> Little Lorikeet	Vulnerable	No	-
<i>Grantiella picta</i> Painted Honeyeater	Vulnerable	No	-
<i>Hieraaetus morphnoides</i> Little Eagle (Foraging)	Vulnerable	No	-
<i>Hoplocephalus bungaroides</i> Broad-headed Snake (Foraging)	Endangered	No	-
<i>Lathamus discolor</i> Swift Parrot (Foraging)	Endangered	No	-
<i>Lophoictinia isura</i> Square-tailed Kite (Foraging)	Vulnerable	No	-
<i>Melanodryas cucullata cucullata</i> Hooded Robin (south-eastern form)	Vulnerable	No	-
<i>Melithreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies)	Vulnerable	No	-
<i>Micronomus norfolkensis</i> Eastern Coastal Free-tailed Bat	Vulnerable	No	-
<i>Miniopterus australis</i> Little Bent-winged Bat (Foraging)	Vulnerable	No	-

Scientific Name	BC Act Status	Excluded from Assessment	Reason for Exclusion from Assessment
<i>Miniopterus orianae oceanensis</i> Large Bent-winged bat (Foraging)	Vulnerable	No	-
<i>Neophema pulchella</i> Turquoise Parrot	Vulnerable	No	-
<i>Ninox connivens</i> Barking Owl (Foraging)	Vulnerable	No	-
<i>Ninox strenua</i> Powerful Owl (Foraging)	Vulnerable	No	-
<i>Petroica boodang</i> Scarlet Robin	Vulnerable	No	-
<i>Phascolarctos cinereus</i> Koala (Foraging)	Vulnerable	No	-
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Foraging)	Vulnerable	No	-
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	Vulnerable	No	-
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat	Vulnerable	No	-
<i>Stagonopleura guttata</i> Diamond Firetail	Vulnerable	No	-
<i>Tyto novaehollandiae</i> Masked Owl (Foraging)	Vulnerable	No	-
<i>Varanus rosenbergi</i> Rosenberg's Goanna	Vulnerable	No	-

4.2 Candidate Species Credit Species Summary

This section provides a summary of the candidate species credit fauna and flora species for the Subject Land derived from BAMC (DPIE 2019b). A summary of the targeted survey effort applied to each species is provided along with the results of the survey effort, specifically whether or not the species credit needs to be offset through retiring of Biodiversity Offset Credits (**Table 7; Table 8**). As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. Therefore, all non-SAIL species were excluded from the assessment.

Table 7. Candidate Fauna Credit Species predicted to occur within the Subject Land

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Anthochaera phrygia</i> Regent Honeyeater (Breeding)	No, the Subject Land is not included on the map of important areas for Regent Honeyeaters.	No	NA	Very High – 3	No
<i>Callocephalon fimbriatum</i> - <i>endangered population</i> Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Calyptorhynchus lathami</i> Glossy Black- Cockatoo (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Cercartetus nanus</i> Eastern Pygmy-possum	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	This species is known to occur within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels. Such geological features were not observed within or adjacent to the Subject Land. Furthermore, as the Subject Land and surrounds are located within a moderately flat terrain with little topographical variation, it is highly unlikely such habitat features would occur within the area surrounding the Subject Land. As such, this species was excluded from the assessment.	No	NA	Very High - 3	No
<i>Heleioporus australiacus</i> Giant Burrowing Frog	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Hieraaetus morphnoides</i> Little Eagle (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Hoplocephalus bungaroides</i> Broad-headed Snake (Breeding)	This species is known to inhabit rocky areas including escarpments, outcrops and pagodas within the Sydney Sandstone geologies. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	NA	Very High - 3	No
<i>Lathamus discolor</i> Swift Parrot (Breeding)	No, the Subject Land is not included on the draft map of important areas for Swift Parrot. This species also does not breed on mainland Australia.	No	NA	Very High - 3	No
<i>Litoria aurea</i> Green and Golden Bell Frog	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Litoria booroolongensis</i> Booroolong Frog	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Lophoictinia isura</i> Square-tailed Kite (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Miniopterus australis</i> Little Bent-winged Bat (Breeding)	This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	NA	Very High - 3	No
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Breeding)	This species is known to breed in caves, tunnels, mines and culverts. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	NA	Very High - 3	No
<i>Mixophyes balbus</i> Stuttering Frog	This species is typically associated with flowing streams, often in rainforest or wet sclerophyll forest. As such habitat does not occur within the Subject Land, this species was excluded from the assessment.	No	NA	Very High - 3	No
<i>Myotis Macropus</i> Southern Myotis	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Ninox connivens</i> Barking Owl (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Ninox strenua</i> Powerful Owl (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species.	No	NA	High - 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
	This species is not an SAIL species and was therefore excluded from the assessment.				
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Phascolarctos cinereus</i> Koala (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Pommerhelix duralensis</i> Dural Land Snail	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Pseudophryne australis</i> Red-crowned Toadlet	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Tyto novaehollandiae</i> Masked Owl (Breeding)	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No

Table 8. Candidate Flora Credit Species predicted to occur within the Subject Land

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Acacia bynoeana</i> Bynoe's Wattle	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Acacia gordonii</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Acacia pubescens</i> Downy Wattle	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Ancistrachne maidenii</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High – 2	No
<i>Asterolasia elegans</i>	After carrying out a field assessment of the habitat constraints or microhabitats on the Subject Land, it was determined that the habitat is substantially degraded such that the species is unlikely to utilise the Subject Land. Site assessment revealed that the Subject Land was heavily grazed. Due to the lack of native species diversity and abundance, grazing has likely been undertaken within the Subject Land for many years. It is therefore highly unlikely this species would remain dormant in the seed bank. Due to such factors, this species was excluded from the assessment.	No	NA	Very High – 3	No
<i>Callistemon linearifolius</i> Netted Bottle Brush	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Darwinia biflora</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Dillwynia tenuifolia</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Dillwynia tenuifolia</i> - endangered population Dillwynia tenuifolia Sieber ex D.C. in the Baulkham Hills local government area	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Epacris purpurascens</i> var. <i>purpurascens</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Eucalyptus</i> sp. <i>Cattai</i>	Yes	Yes	No	Very High – 3	No
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> Small-flower Grevillea	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Grevillea parviflora</i> subsp. <i>supplicans</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Gyrostemon thesioides</i>	This species is associated with sandy, alluvial or colluvial soil within 50m of a watercourse. As such habitat constraints are not present within the Subject Land, this species was excluded from the assessment.	No	NA	Very High – 3	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Hibbertia puberula</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Hibbertia superans</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Kunzea rupestris</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Lasiopetalum joyceae</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Leucopogon fletcheri</i> subsp. <i>fletcheri</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Melaleuca deanei</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Micromyrtus blakelyi</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	Moderate - 1.5	No
<i>Olearia cordata</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No

Scientific Name	Included in Assessment?	Targeted Survey conducted?	Present within Subject Land?	Biodiversity Risk Weighting	Biodiversity Offset Credits Required?
<i>Persoonia hirsuta</i> Hairy Geebung	Yes	Yes	No	Very High – 3	No
<i>Pimelea curviflora</i> var. <i>curviflora</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Pomaderris brunnea</i> Brown Pomaderris	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Rutidosia heterogama</i> Heath Wrinklewort	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Tetratheca glandulosa</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No
<i>Velleia perfoliata</i>	As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. This species is not an SAIL species and was therefore excluded from the assessment.	No	NA	High - 2	No

4.3 Targeted Species Credit Surveys

Targeted threatened species surveys were undertaken for SAIL 'Species Credit Species' determined likely to occur within the Subject Land, as predicted by the BAMC. Targeted surveys were carried out within the approved survey period for all species, as identified within the BAMC (**Table 10**), and were implemented in accordance with Section 6.5 of the BAM and all relevant OEH threatened species survey guidelines.

Targeted surveys were undertaken on 18th February 2020. Weather conditions taken from the nearest weather station (Richmond RAAF; Station No. 067105) in the lead up and during the field survey are outlined in **Table 9**.

Weather conditions during the survey periods were generally conducive for identifying threatened species should they occur within the Subject Land. Rainfall in the week prior to the targeted flora surveys, including heavy falls within the two weeks leading up to the surveys (BOM 2020a), provided ideal conditions for the flowering of the targeted flora species.

Table 9. Weather conditions taken from the nearest weather stations (Station number 067105) in the lead up and during the field survey (BOM 2020a). Survey dates are in bold.

Timing/activities	Date	Day	Temperature		Rainfall (mm)
			Min	Max	
Lead up to the survey	11/02/2020	Tuesday	20.5	31.9	0.8
	12/02/2020	Wednesday	21.6	27.4	0.2
	13/02/2020	Thursday	21.5	26.7	15.6
	14/02/2020	Friday	20.1	28.7	9.2
	15/02/2020	Saturday	17.2	30.3	0
	16/02/2020	Sunday	20	27	13.2
	17/02/2020	Monday	20.5	25.4	0.2
Site Assessment (Vegetation Mapping and BAM Plots, Targeted Flora Survey)	18/02/2020	Tuesday	20.3	34.6	6.6

4.3.1 Fauna Species Credit Survey

A total of twenty-five (25) threatened fauna species were identified within the BAMC (DPIE 2019b) as having the potential to occur within the Subject Land. None of these species were surveyed for due to the following:

- Species are considered unlikely to occur and no further assessment is required for that species if it is determined that no habitat constraints are present on the entire Subject Site for the threatened species (as per Section 6.4.1.13 of the BAM) (OEH 2017a), or
- As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAIL species. Therefore, all non-SAIL species were excluded from the assessment.

4.3.2 Flora Species Credit Survey

A total of twenty-eight (28) threatened flora species were identified within the BAMC (DPIE 2019b) as having the potential to occur within the Subject Land. Targeted flora surveys were conducted for two (2) of those species within the approved survey period (**Table 10**). Twenty-six (26) flora species were not surveyed for due to the following:

- The habitat within the Subject Land was considered to be 'substantially degraded such that the species is unlikely to utilise the Subject Land' in accordance with Section 6.4.1.17(a) of the BAM (OEH 2017a). As per Section 6.4.1.18 of the BAM, 'A candidate species credit species that is not considered to have

suitable habitat on the Subject Land (or specific vegetation zones) in accordance with Paragraph 6.4.1.17 does not require further assessment on the Subject Land (or specific vegetation zones)' (OEH 2017a); or

- Species are considered unlikely to occur and no further assessment is required for that species if it is determined that no habitat constraints are present on the entire Subject Site for the threatened species (as per Section 6.4.1.13 of the BAM) (OEH 2017a); or
- As per Appendix 2 of the BAM (OEH 2017a), the Streamlined Assessment Module only requires surveying for SAI species. Therefore, all non-SAI species were excluded from the assessment.

Targeted flora surveys were conducted for the species listed in **Table 10** over one (1) day in February 2020. Targeted surveys were undertaken using parallel field traverses in accordance with the 'NSW Guide to Surveying Threatened Plants' (OEH 2016).

Table 10. Species credit flora species requiring targeted surveys. Targeted surveys were conducted within DPIE endorsed survey periods.

Candidate Fauna Species	Survey Period (BAMC)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Eucalyptus</i> sp. <i>Cattai</i>			✓									
<i>Persoonia hirsuta</i> Hairy Geebung			✓									
Key	✓ = Surveyed					= Optimum Survey Period						

4.4 Species Polygons

No species credit species were assumed to be present within the Subject Land. Therefore, no species polygons were assigned.

5. Avoid and Minimise Impacts

5.1 Impact Mitigation and Minimisation Measures

This section details the measures to be implemented before, during and post construction to avoid and minimise the impacts of the project (Table 11).

Table 11. Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the project.

Action	Outcome	Timing	Responsibility
Avoid and Minimise Impact - Project Location and Design	The development has been strategically positioned to minimise impacts on native vegetation and habitat as much as possible. The proposed development is to be located within historically cleared land that contains scattered native canopy trees. The Subject Land is currently used for grazing and contains low biodiversity values. Any temporary structures required for construction works should be located within the Subject Land or areas containing no native vegetation. This will avoid unnecessary impacts on native vegetation and habitat elsewhere within the Subject Property.	Pre-construction phase	Proponent
Avoid and Minimise Impact – Project Planning	The proponent must ensure that adequate erosion and sediment measures are in place at all times during construction activity. Always follow best practice guidelines (Landcom 2004).	Pre-construction phase	Proponent
Preparation of a Construction Environmental Management Plan (CEMP)	A Construction Environmental Management Plan (CEMP) will be required for the construction phase of the project, and will be prepared prior to issue of the Construction Certificate. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, as well as site-specific measures, including the procedures outlined below. The proposed mitigation measures would include environmental safeguards for protection of neighbouring properties and nearby waterways in accordance with relevant policy documentation and Government guidelines. In order to address the potential impacts of the proposal on biodiversity, the mitigation and management measures outlined within this table would be implemented as part of the CEMP for the site.	Pre-construction phase	- Proponent - Project Ecologist - Construction Contractor

Action	Outcome	Timing	Responsibility
Assigning a Project Ecologist for vegetation clearing and restoration	Prior to construction, the applicant should commission the services of a qualified and experienced Ecologist Consultant (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist will be commissioned to: - Assist the applicant in identifying and assigning an appropriate skilled Bushland Restoration Professional to implement vegetation restoration if required; - Help the applicant undertake any threatened species habitat augmentation or translocation; - Undertake any required targeted searches for threatened flora prior to vegetation clearing; - Undertake an extensive pre-clearing survey; delineating habitat-bearing trees and shrubs to be retained/removed; and - Supervise the clearance of trees and shrubs (native and exotic) in order to capture, treat and/or relocate any displaced fauna.	Prior to and during vegetation clearance works	- Proponent - Project Ecologist
Tree Protections	Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ. A Minor Encroachment is less than 10% of the TPZ and is outside the SRZ. A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods.	Pre-construction phase	- Proponent - Arborist



Action	Outcome	Timing	Responsibility
Relocation of woody debris	Any woody debris (fallen trees and logs) within the Subject Land are to be relocated to an area of native vegetation adjacent to the Subject Land.	Construction phase	- Project Ecologist - Proponent - Bush regeneration contractor
Erosion and Sedimentation	Appropriate erosion and sediment control must be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. As a minimum, such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Construction phase	- Proponent - Construction Contractor
Erection of temporary fencing	Temporary fencing should be erected around retained native vegetation that may incur indirect impacts on biodiversity values due to the construction works.	Construction phase	- Proponent - Construction Contractor
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile and laydown sites away from any native vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site in order to avoid the potential of incurring indirect impacts on biodiversity values.	Construction phase	Construction Contractors
Stormwater	Potential impacts relating to stormwater and runoff will be managed during construction and operation phases. The Construction Environmental Management Plan (CEMP) will guide stormwater management during the construction phase of development.	Post-construction phase	- Proponent - Construction Contractors/ Architect



6. Impact Summary

6.1 Impacts on Native Vegetation

The following native vegetation within the Subject Land is proposed to be impacted as a result of the proposed development:

- 1.55 ha representative of PCT 1081 - Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion

The purchase and retirement of Biodiversity Offset Credits will be required for the following native vegetation within the Subject Land:

- 0.55 ha within Vegetation Zone 1 (Remnant Canopy), representative of PCT 1081.

6.2 Impacts on Threatened Species

No threatened species are predicted to be impacted as a result of the proposed development.

6.3 Serious and Irreversible Impacts (SAIL's)

No SAIL species are predicted to be impacted as a result of the proposed development.

6.4 Other Impacts

6.4.1 Indirect Impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the Subject Land. Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. The indirect impacts of this proposed development are outlined in **Table 12**.

Table 12. Indirect impacts associated with the proposed development.

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(a) inadvertent impacts on adjacent habitat or vegetation	Vegetation and habitat directly adjacent to the Subject Land has the potential to experience ongoing indirect impacts as a result of the proposed development. The disturbance caused during construction may increase weed infestations within adjacent vegetation, which in turn may decrease its habitat value. Furthermore, the proposed development has the potential to alter the natural hydrology occurring within the area, due to an increase in hard surfaces. This in turn may negatively impacting vegetation downslope of the Subject Land by altering natural runoff.	Although no threatened ecological communities occur directly adjacent to the Subject Land, there is the potential that threatened species and ecological communities occur downslope of the Subject Land that may be impacted by hydrological changes.	While hydrological changes may have a localised impact to threatened species, threatened ecological communities and their habitats, this is not expected to impact on their bioregional persistence.
(b) reduced viability of adjacent habitat due to edge effects	The proposed construction and on-going operation may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects. This may in turn reduce the viability of such habitats, with the impact expected to be restricted to a couple of metres into adjacent vegetation.	No ecological communities occur directly adjacent to the Subject Land and as such will not be affected. There is potential that threatened species use habitat adjacent to the Subject	While edge effects may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence, considering the large habitat

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
		Land. Such species may be impacted by edge effects leading to a reduced viability in habitat.	connectivity within the surrounding areas.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	An increase in noise is to be expected during and post-construction. As the Subject Land is located in a semi-rural area, this may have an impact on any species roosting adjacent to the site during the day that are not adapted to such noises, as would be expected with typical urban species. It is not expected that construction and operation of the resource facility would occur throughout the night, and as such would not impact on nocturnal species that may utilise adjacent habitat, or diurnal species that roost in adjacent habitat. The construction and operation of the resource management facility may increase dust in adjacent habitat. Dust can impact on a plants ability to photosynthesise and may increase plant mortality in the adjacent vegetation. It is however not expected that this would have such an impact to decrease the viability of adjacent habitat. It is expected that the construction and operation of the resource management facility would occur during normal working hours, and as such light spill is not expected to affect adjacent habitat.	No threatened ecological communities occur directly adjacent to the Subject Land and as such won't be impacted by increases in noise and dust spill. There is potential that threatened species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in noise and dust spill into adjacent habitats.	While the construction and operation of the resource management facility may have a localised impact to threatened species, this is not expected to impact on their bioregional persistence, considering large areas of habitat connectivity allowing their movement away from impacted areas.

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(d) transport of weeds and pathogens from the site to adjacent vegetation	As previously discussed, the proposed construction and on-going operation may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects. It is however not expected that weeds will be transported via human or vehicular traffic into surrounding areas during construction and operation of the resource management facility. Temporary fencing will be erected around retained native vegetation to avoid such indirect impacts occurring during construction. It is not expected that such areas would be accessible post-construction.	N/A	N/A
(e) increased risk of starvation, exposure and loss of shade or shelter	It is highly unlikely that any threatened fauna would be exposed to increased risks from starvation, exposure, and loss of shade and shelter beyond the Subject Land as a result of the proposed development. No habitat is to be removed beyond the Subject Land, although disturbances from noise during construction and operation may deem such habitats unsuitable for certain species. However, due to the large areas of habitat connectivity adjoining the Subject Land, it is unlikely that this impact will be significant as such habitats will continue to provide food resources and shelter for fauna species.	N/A	N/A
(f) loss of breeding habitats	An increase in noise is to be expected during and post-construction. As such, there is potential for disturbance to	There is potential that threatened fauna species use habitat adjacent to the Subject	This impact is expected to be localised and will not have an overall

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
	breeding habitats directly adjacent to the Subject Land. However, due to the large areas of habitat connectivity adjoining the Subject Land, it is not expected for this to significantly impact on species inhabiting such areas.	Land for breeding. Such species may be impacted by an increase in noise into adjacent habitats, which may in turn impact on their breeding habitat.	impact on the bioregional persistence of threatened species.
(g) trampling of threatened flora species	No threatened flora species were recorded within the Subject Land. Although no threatened flora species have been historically recorded directly adjacent to the Subject Land, there is still the potential for such species to exist in these areas, as these areas were not surveyed. In order to prevent the trampling of threatened flora species that could potentially occur within adjacent habitat, such habitats will be delineated with temporary fencing to avoid such impacts occurring during construction. It is not expected that such areas would be accessible post-construction.	N/A	N/A
(h) inhibition of nitrogen fixation and increased soil salinity	It is unlikely that the inhibition of nitrogen fixation will affect vegetation adjacent to the Subject Land. Increased soil salinity may result due to clearing of vegetation leading to the rising of the water table. However, clearing will be limited to the Subject Land and as such is not expected to affect vegetation directly adjacent to the Subject Land.	N/A	N/A
(i) fertiliser drift	This issue is not likely to affect the vegetation within or surrounding the Subject Land. No fertiliser is expected to be	N/A	N/A

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
	used during construction and operation of the resource management facility.		
(j) rubbish dumping	An increase in traffic on Sargents Road as a result of the construction and operation of the resource management facility may lead to an increase in rubbish dumping (including littering) within vegetated areas adjacent to the Subject Land. The dumping/littering of food resources may provide a food source for fauna, including threatened species. However, this may also encourage invasive species into such habitats.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by the dumping of rubbish, particularly food resources. This may result in both positive (food source) and negative impacts (increase in predators) to such species.	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of threatened species.
(k) wood collection	An increase in traffic on Sargents Road as a result of the construction and operation of the resource management facility may lead to an increase in wood collection from adjacent vegetated areas. In turn, this will negatively impact on species that rely on logs for shelter.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. The collection of wood from such habitat may impact on threatened species that rely on such habitat for survival.	This impact is expected to be localised and will not have an overall impact on the bioregional persistence of threatened species.
(l) bush rock removal and disturbance	An increase in traffic on Sargents Road as a result of the construction and operation of the resource management facility may lead to an increase in bush rock removal and disturbance in adjacent vegetated areas. In turn, this will negatively impact on species that rely on such habitat for shelter.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. The removal and disturbance of bush rock may impact on threatened species	N/A

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
		that rely on such habitat for survival.	
(m) increase in predatory species populations	There is potential that predatory species, such as foxes and cats, already inhabit areas within and surrounding the Subject Land. There is the possibility that other indirect impacts, such as an increase in rubbish dumping, may encourage predatory species into the area.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in predatory species populations.	An increase in predatory species adjacent to the Subject Land may have widespread ramifications for any locally occurring threatened species. In particular, the large areas of habitat connectivity adjacent to the Subject Land will allow for the movement of predatory species across the wider landscape.
(n) increase in pest animal populations	There is potential that pest animal populations already inhabit areas within and surrounding the Subject Land. There is the possibility that other indirect impacts, such as an increase in rubbish dumping, may encourage an increase in pest animal populations.	There is potential that threatened fauna species use habitat adjacent to the Subject Land. Such species may be impacted by an increase in pest animal populations.	An increase in pest animal species adjacent to the Subject Land may have widespread ramifications for any locally occurring threatened species. In particular, the large areas of habitat connectivity adjacent to the Subject Land will allow for the movement of pest animal species across the wider landscape.
(o) increased risk of fire	The Subject Land is identified by Hawkesbury City Council as occurring within bushfire prone land. An APZ will surround the proposed development within the Subject Land, which in turn will reduce the risk of bushfire. It is not expected that this will	N/A	N/A

Indirect Impact	Nature, extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
	alter the bushfire risk of vegetation surrounding the Subject Land.		
(p) disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	No specialist breeding and foraging habitat was identified within or adjacent to the Subject Land. It is therefore not expected that the proposed development will disturb any specialist breeding and foraging habitat.	N/A	N/A



6.4.2 Prescribed and Uncertain Impacts

This list of impacts includes all of those impacts on biodiversity values not caused by direct vegetation clearing or development that have been prescribed by the Biodiversity Conservation Regulation 2017. Prescribed biodiversity impacts require an assessment of the impacts of development on the habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance. This is discussed in **Table 13** below.

Table 13. Prescribed and uncertain impacts associated with the proposed development.

Will there be impacts on any of the following	Yes/No	If Yes, Address all of the assessment questions from section 9.2.1 of the BAM
Species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance	No	There is no karst, caves, crevices, cliffs and other features of geological significance on or near the Subject Land.
Habitat of threatened species or ecological communities associated with rocks	No	No threatened species or ecological communities associated with rocks were located on the Subject Land.
Habitat of threatened species or ecological communities associated with human made structures	No	There are no threatened species or ecological communities located within the Subject Land that are associated with human made structures.
Habitat of threatened species or ecological communities associated with non-native vegetation	No	There will be no impact to the habitat of threatened species or ecological communities associated with non-native vegetation. Non-native vegetation exists in the form of herbaceous weeds and exotic grasses.
Connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	No	It is unlikely the proposed development will interrupt connectivity for any threatened species, as extensive areas of habitat connectivity will continue to exist in vegetated areas surrounding the Subject Land.



Will there be impacts on any of the following	Yes/No	If Yes, Address all of the assessment questions from section 9.2.1 of the BAM
Movement of threatened species that maintains their life cycle	No	It is unlikely that the area of impact will interrupt the movement of threatened fauna or flora species that maintains their life cycle, considering the extensive areas of habitat connectivity surrounding the Subject Land.
Water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including subsidence or upsidence resulting from underground mining or other development)	No	There are no threatened species and ecological communities within the Subject Land that are sustained by water bodies and hydrological processes.
Wind turbine strikes on protected animals	No	There are no wind turbines proposed on the Subject Land.
Vehicle strikes on threatened species of animals or on animals that are part of a TEC	No	There is no potential habitat within the Subject Land that supports threatened species. It is therefore unlikely that vehicle strikes on threatened species of animals will be an issue. No threatened ecological communities were located within the Subject Land.



6.5 Biodiversity Offset Credit Requirements

The preferred approach to offset the residual impacts of the proposal is to purchase and retire the appropriate species credits from registered Biodiversity Stewardship Sites that comply with the trading rules of the NSW BOS in accordance with the 'like for like' report generated by the BAM calculator. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAMC.

A payment to the Biodiversity Conservation Trust (BCT) would be considered as a contingency option if a suitable number and type of biodiversity credits cannot be secured.

6.5.1 Offset Requirement for Ecosystem Credits

A total of six (6) ecosystem credits are required to offset the biodiversity impacts of the proposed development (**Table 14**). Estimated costs to purchase these credits, or alternatively, to allocate offset funds directly into the NSW BCT are available in the NSW Biodiversity Offsets Payment Calculator (DPIE 2020a).

Table 14. Ecosystem credits required to offset the proposed development.

Plant Community Type (PCT)	BC Act Status	Zone	Total Area (ha)	Ecosystem Credits Required
PCT 1081: Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	Not a TEC	Zone 1: Remnant Canopy	0.55	6
		Zone 2: Cleared	1.00	0
Total Ecosystem Credits				6

6.5.2 Offset Requirement for Species Credits

No candidate species credit species will require offsetting through the retiring of biodiversity offset species credits under the BOS as a result of the proposed development.

7. References

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8. Appendices

Appendix A. BAM Site - Field Survey Forma (copied directly from Electronic Data Sheet).

Appendix B. BAMC Generated Biodiversity Credit Report.

Appendix A. BAM Site - Field Survey Forma (copied directly from Electronic Data Sheet).

BAM Site – Field Survey Form					
Date:	18/02/2020	Plot ID:	Plot 1	Photo #:	-
Zone:	56	Plot Dimensions:	20 x 50m	Easting:	301897.70 E
Datum:	GDA94	Middle bearing from 0m:	130°	Northing:	6288293.98 S
PCT:	PCT 1081: Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion [Vegetation Zone 1: Remnant Canopy]				

Growth Form	Scientific Name	Cover	Abundance
Tree (TG)	<i>Acacia binervia</i>	5	2
#N/A	<i>Amaranthus viridis</i>	0.1	1
HTE	<i>Cenchrus clandestinum</i>	5	100
Grass & grasslike (GG)	<i>Digitaria didactyla</i>	15	N/A
Forb (FG)	<i>Dysphania</i> spp.	0.1	5
Forb (FG)	<i>Einadia hastata</i>	1	10
Tree (TG)	<i>Eucalyptus punctata</i>	20	N/A
Tree (TG)	<i>Eucalyptus tereticornis</i>	15	N/A
#N/A	<i>Lepidium africanum</i>	0.1	2
#N/A	<i>Malva</i> spp.	5	100
#N/A	<i>Modiola caroliniana</i>	0.1	5
Forb (FG)	<i>Portulaca oleracea</i>	0.1	5
#N/A	<i>Sida rhombifolia</i>	10	N/A
#N/A	<i>Solanum sisymbriifolium</i>	0.1	5

DBH	# Tree Stems Count	# Hollow Bearing Trees
80+cm	1	1
50-79cm	1	0
30-49cm	Present	0
20-29cm	Absent	0
10-19cm	Present	0
5-9cm	Present	0
<5cm	Present	0

Length of Logs (m)	0



BAM Site – Field Survey Form

BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	30
2 (15m)	5
3 (25m)	15
4 (35m)	15
5 (45m)	5
Average	14

Growth Form	Composition Data (count of native cover)	Structure Data (sum of cover)
Tree	3	40
Shrub	0	0
Grass	1	15
Forb	3	1.2
Fern	0	0
Other	0	0
High Threat Exotics	1	5

BAM Site – Field Survey Form					
Date:	18/02/2020	Plot ID:	Plot 2	Photo #:	-
Zone:	56	Plot Dimensions:	20 x 50m	Easting:	301939.39 E
Datum:	GDA94	Middle bearing from 0m:	215°	Northing:	6288241.47 S
PCT:	PCT 1081: Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion [Vegetation Zone 2: Cleared]				

Growth Form	Scientific Name	Cover	Abundance
Grass & grasslike (GG)	<i>Carex</i> spp.	0.1	1
HTE	<i>Cenchrus clandestinum</i>	4	50
Grass & grasslike (GG)	<i>Digitaria didactyla</i>	65	N/A
Forb (FG)	<i>Dysphania</i> spp.	0.1	10
Shrub (SG)	<i>Kunzea ambigua</i>	1	2
#N/A	<i>Malva</i> spp.	5	50
Forb (FG)	<i>Portulaca oleracea</i>	0.1	10
#N/A	<i>Sida rhombifolia</i>	10	N/A
#N/A	<i>Solanum sisymbriifolium</i>	0.1	2

DBH	# Tree Stems Count	# Hollow Bearing Trees
80+cm	0	0
50-79cm	0	0
30-49cm	Absent	0
20-29cm	Absent	0
10-19cm	Absent	0
5-9cm	Absent	0
<5cm	Present	0

Length of Logs (m)	0

BAM Attribute (1x1m)	Litter Cover (%)
1 (5m)	5
2 (15m)	0
3 (25m)	0
4 (35m)	0
5 (45m)	5



BAM Site – Field Survey Form	
Average	2

Growth Form	Composition Data (count of native cover)	Structure Data (sum of cover)
Tree	0	0
Shrub	1	1
Grass	2	65.1
Forb	2	0.2
Fern	0	0
Other	0	0
High Threat Exotics	1	4



Appendix B. BAMC Generated Biodiversity Credit Report.



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment ID	Proposal Name	BAM data last updated :
00019258/BAAS19040/20/00019259	99 Sargents Road Ebenezer	26/11/2019
Assessor Name	Assessor Number	BAM Data version *
Alexander Graham	BAA519040	22
Proponent Names	Report Created	BAM Case Study
	20/03/2020	Open
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (Small Area)	To be finalised

Potential Serious and Irreversible Impacts

Nil

Nil

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Binner.

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Assessment ID	Proposal Name
00019258/BAAS19040/20/00019259	99 Sargents Road Ebenezer

Page 1 of 3



BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
1081-Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	Not a TEC	1.6	6,00

1081-Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Sydney Hinterland Dry Sclerophyll Forests This includes PCT's: 612, 621, 624, 1080, 1081, 1086, 1159 1246, 1255, 1327, 1328, 1614, 1622 1628, 1631, 1634, 1640, 1664, 1666 1667, 1789, 1790, 1912	Sydney Hinterland Dry Sclerophyll Forests - 50%	Yes	Yengo, Cumberland, Hunter, Kerrabee, Pittwater, Wollemi and Wyong. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Assessment ID	Proposal Name
00019258/BAAS19040/20/00013059	99 Sargents Road Ebenezer

Page 14 of 17



BAM Biodiversity Credit Report (Like for like)

No Species Credit Data

Assessment ID

00019258/BAAS18040/20/00015358

Proposed Name

99 Sargents Road, Ebenezer

Page 1 of 1



NARLA

environmental

Eastern Sydney Office

Unit 2/8 Apollo Street
Warriewood
NSW 2102

Western Sydney Office

7 Twentyfifth Avenue
West Hoxton
NSW 2171

Hunter Valley Office

10/103 Glenwood Drive
Thornton
NSW 2322

www.narla.com.au

Ph: 02 9986 1295

ATTACHMENTS

EIS Attachment 1: NSW DP&E SEARs



Mr Richard Benbow
Benbow Environmental
PO Box 687
PARRAMATTA NSW 2124

SEAR 1249

Dear Mr Benbow

**Resource Recovery Facility
99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665)
Secretary's Environmental Assessment Requirements (SEAR) 1249**

Thank you for your request for the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

In support of your application, you indicated that your proposal is both designated and integrated development under Part 4 of the *Environmental Planning and Assessment Act 1979* and requires an approval under the *Protection of the Environment Operations Act 1997*. In preparing the SEARs, the Department has consulted with the Environment Protection Authority (EPA), Office of Environment and Heritage (OEH), Department of Primary Industry (DPI), and the Rural Fire Service (RFS).

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 the Environment and Energy on (02) 6274 1111.

Should you have any further enquiries, please contact John Booth, Planning Services, at the Department on the details above.

Yours sincerely

Chris Ritchie

Director

Industry Assessments

as delegate of the Secretary

10/9/18.

Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*.

Designated Development

SEAR Number	1249
Proposal	The proposal is for a resource recovery facility with maximum processing capacity of 20,000 tonnes of waste per year.
Location	99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665)
Applicant	Hala Constructions Pty Ltd
Date of Issue	06/09/18
General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i> .
Key Issues	The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed: • strategic context – including: – a detailed justification for the proposal and suitability of the site for the development; – a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies; and – a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out. • suitability of the site – including: – 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 – floor plans depicting the proposed internal layout including the location of machinery and equipment. • 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; – details of machinery and waste processing to be used; and – 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 Resource Recovery Strategy 2014-21</i>. • hazards and risk – including: – a preliminary risk screening completed in accordance with <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33</i> (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 <i>Hazardous Industry</i>

	<i>Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis</i> (DoP, 2011) and <i>Multi-Level Risk Assessment</i> (DoP, 2011); - an assessment of the risk of bushfire, including addressing the requirements of <i>Planning for Bush Fire Protection 2006</i> (RFS). Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers). Provision is to be made for their appropriate management into the future; and - any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations to address this; • air quality – including: - a description of all potential sources of air and odour emissions; - an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines; and - a description and appraisal of air quality impact mitigation, management and monitoring measures. • noise and vibration – including: - a description of all potential noise and vibration sources during construction and operation, including road traffic noise; - a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines; and - a description and appraisal of noise and vibration mitigation, management and monitoring measures. • soil and water – including: - an assessment of potential impacts to soil and water resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby the site; - a detailed site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise water use at the site; - details of any groundwater extraction and any works with potential to intercept the groundwater table; - characterisation of water quality at the point of discharge to surface and/ or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters); - details of stormwater/ wastewater/ leachate/ firewater management systems including details of the flood liability of the site and changes to flooding behaviour; - consideration of salinity and acid sulfate soil impacts; and - characterisation of the nature and extent of any contamination on the site and a description of proposed management measures. • 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 and fire (including location of fire hydrants and water flow rates at the hydrant) management and contaminant measures; and - details of size and volume of stockpiles and their arrangements and separation to minimise fire spread and facilitate emergency vehicle access. • traffic and transport – including: - details of road transport routes and access to the site; - road traffic predictions for the development during construction and operation; and - an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development. • biodiversity – including: - accurate predictions of any vegetation clearing on site or for any road upgrades;

	- details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies; and - a detailed description of the measures to avoid, minimise, mitigate and offset biodiversity impacts. • visual – including an impact assessment at private receptors and public vantage points. • heritage – including Aboriginal and non-Aboriginal cultural heritage.
Environmental Planning Instruments and other policies	The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to: • <i>State Environmental Planning Policy (Infrastructure) 2007</i>; • <i>State Environmental Planning Policy (Rural Lands) 2008</i>; • <i>State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017</i> • <i>State Environmental Planning Policy No. 19 – Bushland in Urban Areas</i> • <i>State Environmental Planning Policy No 44–Koala Habitat Protection</i>; • <i>State Environmental Planning Policy No 55–Remediation of Land</i>; • <i>Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (No 2 – 1997)</i>; • <i>Hawkesbury Local Environmental Plan 2012</i>; and • relevant development control plans and section 94 plans.
Guidelines	During the preparation of the EIS you should consult the Department's Register of Development Assessment Guidelines which is available on the Department's website at planning.nsw.gov.au under Development Proposals/Register of Development Assessment Guidelines. Whilst not exhaustive, this Register contains some of the guidelines, policies, and plans that must be taken into account in the environmental assessment of the proposed development.
Consultation	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the: • Environment Protection Authority; • Office of Environment and Heritage; • Department of Primary Industries; • Roads and Maritime Services; • Rural Fire Service; • Hawkesbury City Council; and • the surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultation carried out and issues raised must be included in the EIS.
Further consultation after 2 years	If you do not lodge an application under Section 4.12(8) of the <i>Environmental Planning and Assessment Act 1979</i> within 2 years of the issue date of these SEARs, you must consult with the Secretary in relation to any further requirements for lodgement.

John Booth

From: Mohammed Rahman <mohammed.rahman@crowmland.nsw.gov.au>
Sent: Tuesday, 14 August 2018 10:57 AM
To: Lands Ministerials; Elizabeth Currey; John Booth; Mohammed Rahman
Subject: Fwd: FW: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249
Attachments: image001.png; image002.jpg; image003.jpg; image004.jpg; image001.png; Form A.PDF; 181084_Scoping Rep_Rev1.pdf; Assessment Advice Template.docx

Hi - Lands Ministerials,

A land status investigation on Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249 shows that there is no crown features exist.

Therefore, Department of Industry - Lands has no comments at this moment.

Thank you.

regards,

Mohammed H Rahman | Natural Resources Management Officer Sydney
Regional Services

Department of Industry, Lands and Water Division

PO Box 2185 DANGAR NSW 2309

T: 02 9842 8331 | F: 02 8836 5365 | E: mohammed.rahman@crowmland.nsw.gov.au

W: www.crowmland.nsw.gov.au

----- Forwarded message -----

From: **Mohammed Rahman** <mohammed.rahman@crowmland.nsw.gov.au>

Date: 14 August 2018 at 10:48

Subject: FW: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

To: Mohammed Rahman <mohammed.rahman@crowmland.nsw.gov.au>

From: john.booth@crowmland.nsw.gov.au [mailto:john.booth@crowmland.nsw.gov.au] **On Behalf Of**
Lands Ministerials

Sent: Monday, 30 July 2018 9:16 AM

To: Metro Crownlands; Maitland Crown Lands

Subject: Fwd: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

Good afternoon Metro and Maitland Offices

I am not sure what area this falls in

Can you please arrange for review of the attached information to determine if DoI Crown Lands needs to provide a response. Can you please return any comments to this email address by **Friday, 10 August 2018**.

John Booth

From: Mohammed Rahman <mohammed.rahman@crownland.nsw.gov.au>
Sent: Tuesday, 7 August 2018 10:14 AM
To: Lands Ministerials; Elizabeth Currey; John Booth; Paul Layt; Mohammed Rahman
Subject: Fwd: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

Hi - Elizabeth,

A land status investigation on Input: Resource Recovery Facility –  LGA (Lot 288 DP 751665) – SEAR 1249 shows that there is no Crown Land.

Therefore, Department of Industry - Lands has no comments at this moment.

Thank you.

Regards,

Mohammed H Rahman | Natural Resources Management Officer Sydney
Regional Services

Department of Industry, Lands and Water Division

PO Box 2185 DANGAR NSW 2309

T: 02 9842 8331 | F: 02 8836 5365 | E: 

W: 

----- Forwarded message -----

From: **Metro Crownlands at Crown Lands** <wrike@wrike.com>

Date: 30 July 2018 at 14:35

Subject: Fwd: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

To: 

**Fwd: Request for Input: Resource
Recovery Facility – 99 Sargents
Road, Ebenezer, Hawkesbury LGA
(Lot 288 DP 751665) – SEAR 1249**

ACTIVE

Good afternoon Metro and Maitland Offices

I am not sure what area this falls in

Can you please arrange for review of the attached information to determine if
DoI Crown Lands needs to provide a response. Can you please return any
comments to this email address by **Friday, 10 August 2018**.

If no feedback is received by 10 August 2018, it will be assumed that there is "no

John Booth

From: Marnie Stewart
Sent: Monday, 30 July 2018 11:18 AM
To: John Booth
Subject: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249
Attachments: Form A.PDF; 181084_Scoping Rep_Rev1.pdf
Record Number: DOC2018/0530186

Dear John

After reviewing the relevant documents, OEH's Greater Sydney Planning Team has decided not to provide requirements at this stage.

Please note that the Heritage Division in the Office of Environment and Heritage may wish to provide separate comments

Regards,

Marnie Stewart
Senior Project Officer – Planning
Communities and Greater Sydney Delivery Division
Office of Environment and Heritage
T: 02 9995 6868

 Save paper, save the planet! think before you print.

From: John Booth
Sent: Friday, 27 July 2018 12:56 PM
To: Planning Matters Mailbox ; Adam Oehlman ; reco@oeh.nsw.gov.au
Cc: john.booth@oeh.nsw.gov.au
Subject: Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

Dear All,

Request for Input: Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665) – SEAR 1249

Hala Constructions Pty Ltd (the Applicant) has requested Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above designated development located in the Hawkesbury local government area. The proposal seeks the construction and operation of a Resource Recovery facility.

The proposal is designated development Schedule 3, Clause 16(1)(b)(i) & 32(1)(d)(ii), as it involves crushing, grinding or separating works, being works that process materials or materials for recycling use by crushing, grinding or separating into different sizes that are located within 40 metres of a natural waterbody or wetland, and Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recycle, recover, use or reuse material from waste that are located in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area. Under Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, the Secretary is requesting your requirements for the EIS.



OUT18/11764

2 August 2018

John Booth
GPO Box 39
SYDNEY NSW 2001
John.booth@planning.nsw.gov.au

Dear Mr Booth

SEAR's Request – SEAR 1249 – Resource Recovery Facility – 99 Sargents Road, Ebenezer, Hawkesbury LGA (Lot 288 DP 751665)

Thank you for the opportunity to provide Secretary Environmental Assessment Requirements (SEAR) for the above proposal as per your correspondence dated 27 July 2018.

The NSW Department of Primary Industries (NSW DPI) Agriculture is committed to the protection and growth of agricultural industries, and the land and resources upon which these industries depend. Important issues are the potential impact on limited agricultural resources and the ability to rehabilitate the land to enable continued agricultural investment.

NSW DPI Agriculture provides SEARs (Attachment 1) and a range of publications to assist consent authorities, community and proponents in addressing the recommended SEARs (Attachment 2).

Should you require clarification on the information contained in this response, please contact Agricultural Land Use Planning Officer John Galea on (0427 647 642).

DPI Agriculture is working to ensure that the advice provided is of the highest quality. Please take some time to provide us with feedback on our work by completing a [short survey](#).

Yours sincerely

Lilian Parker
Acting Manager
Agricultural Land Use Planning

Attachment 1: SEARs Recommendations

Issue and desired outcome	Detail / Requirement
Site Suitable for development	- Detail that the proposal is consistent with strategic plans and zone requirements - Complete a Landuse Conflict Risk Assessment (LUCRA) to identify potential landuse conflict, in particular relating to separation distances and management practices to minimise odour, dust and noise from sensitive receptors. A LUCRA is described in the DPI Land Use Conflict Risk Assessment Guide. - Include a map to scale showing the above operational and infrastructure details including separation distances from sensitive receptors.
Consideration for impacts to agricultural resources and land	- Describe the current and potential <i>Important Agriculture Land</i> on the proposed development site and surrounding locality including the land capability and agricultural productivity. - Demonstrate that all significant impacts on current and potential agricultural developments and resources can be reasonably avoided or adequately mitigated. - Consider possible cumulative effects to agricultural enterprises and landholders. - Detail the expected life span of the proposed development
Bushfire risk identified and managed	Risk assessment level and mitigation plan developed to address bush fire risk.
Suitable and secure water supply	- Estimated water demand and water availability should be clearly outlined in the proposal. The source of water and any sanitisation methods to be detailed in the application. - Outline any impacts to water use from agriculture and mitigation measures if required.
Surface & Groundwater protected	- Proposed development design, operation and by-product management should be undertaken to avoid nutrient and sediment build up and minimise erosion, off site surface water movement and groundwater accession. - The proposal should detail how design and operation will be undertaken for by-product management in accordance with best practice to prevent excess build-up of nutrients and salts in the soil profile and increase the risk of leaching. A monitoring program should be developed.
Biosecurity Standards met	- Include a biosecurity (pests, weeds and disease) risk assessment outlining the likely plant, animal and community risks as per guidelines in Attachment 2. - Develop a biosecurity response plan to deal with identified risks as well as contingency plans for any failures. Including monitoring and mitigation measures in weed, disease and pest management plans. - Details of adequate fencing to keep livestock out.
Suitable traffic movements	Consideration of the route for movements needs to be taken into account so that impacts on sensitive receptors are minimised (eg noise, dust, volume of traffic). This should include consideration of Travelling Stock Reserves¹ (TSR) and the movement of livestock or farm vehicles along / across the affected roads
Visual amenity achieved	Amenity impacts are assessed and any necessary response to mitigate visual impacts is described and illustrated.
Land stewardship met	- Develop Rehabilitation and Decommissioning/Closure Management Plans that outlines the rehabilitation objectives and strategies. This includes, but is not limited to, describing the design criteria of the final landuse and landform, indicators to be used to guide the return of the land back to agricultural production, along with the expected timeline for the rehabilitation program. - Outline monitoring and mitigation measures to be adopted for rehabilitation remedial actions.

Issue and desired outcome	Detail / Requirement
Adequate consultation with community	• Consult with relevant agencies such as on the design, construction and operation of the proposed infrastructure. • Consult with the owners / managers of affected and adjoining neighbours and agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation. • Establish a complaints register that includes reporting and investigating procedures and timelines, and liaison with Council in relation to complaint issues.
Contingency and Environmental Management Plan developed	• Contingency plans should be developed to enable the operation to deal with emergency situations. Commitment to the preparation of an Emergency Management plan that outlines procedures and responsibilities for responding to bushfire threats and possible mass mortality events which might result from extreme climatic conditions, routine or emergency animal disease outbreaks.

Attachment 2: Guidelines for assessment

Title	Location
Land Use Conflict Risk Assessment Guide	www.dpi.nsw.gov.au/content/agriculture/resources/lup/development-assessment/lucra
Agricultural Issues for Extractive industry Development	http://www.dpi.nsw.gov.au/content/agriculture/resources/lup/development-assessment/extractive-industries
Agricultural Issues for Landfill Developments	http://www.dpi.nsw.gov.au/content/agriculture/resources/lup/development-assessment/landfill-developments
Infrastructure Proposals on Rural Land	http://www.dpi.nsw.gov.au/content/agriculture/resources/lup/development-assessment/infrastructure-proposals

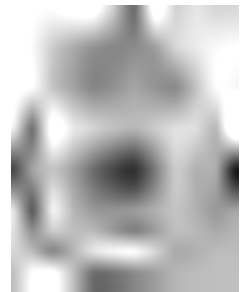
All communications to be addressed to:

Headquarters
15 Carter Street
Lidcombe NSW 2141

Headquarters
Locked Bag 17
Granville NSW 2142

Telephone: 1300 NSW RFS
e-mail: records@rfs.nsw.gov.au

Facsimile: 8741 5433



The Secretary
Department of Planning and Environment (Sydney Offices)
GPO Box 39
Sydney NSW 2001

Your Ref: 1249
Our Ref: D18/6586
DA18073014242 GB

ATTENTION: John Booth

8 August 2018

Dear Sir/Madam

Part 3A/State Significant Development Application - Resource Recovery Facility – 99 Sargents Road, Ebenezer

I refer to your correspondence dated 27 July 2018 seeking key issue and assessment requirements regarding bush fire protection for the above Part 3A/State Significant Development Application in accordance with section 75F (4) of the 'Environmental Planning and Assessment Act 1979'.

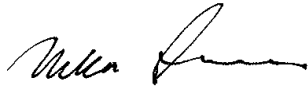
The New South Wales Rural Fire Service (NSW RFS) has considered the information submitted and provides the following advice:

1. There is no objection to the proposed Designated Development.

A bush fire report shall be prepared by a suitably qualified person, as part of the preparation of an Environmental Impact Statement. The report should consider the aims and objectives of Planning for Bush Fire Protection, including emergency and evacuation planning, and provide recommendations that achieve a better bush fire outcome for the existing development.

Should you wish to discuss this matter please contact Garth Bladwell on 1300 NSW RFS.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Nika Fomin', with a stylized, flowing script.

Nika Fomin
Manager, Planning & Environment Services East

For general information on bush fire protection please visit www.rfs.nsw.gov.au

Our ref: OUT18/12219

Mr John Booth
Parra Planner, Industry Assessments
NSW Planning & Environment
GPO Box 39
SYDNEY NSW 2001

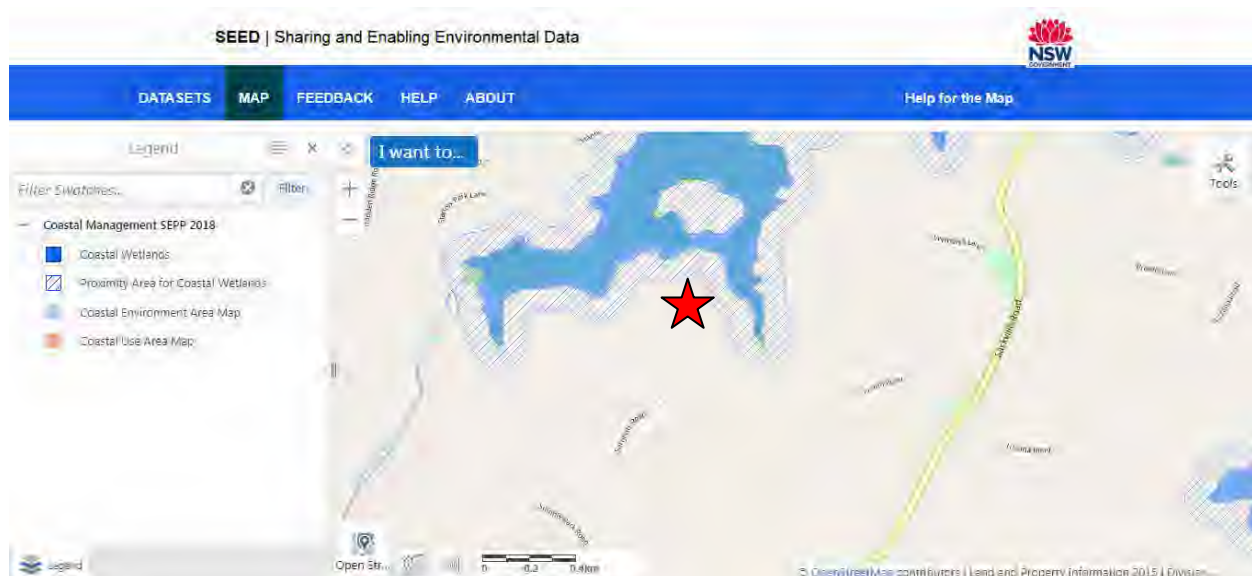
Dear Mr Booth,

Request for input into Secretary's Environmental Assessment Requirements for Resource Recovery Facility – 99 Sargents Rd, Ebenezer

Thank you for your email to NSW Department of Primary Industries (DPI) dated 27 July 2018 requesting input into the Secretary's Environmental Assessment Requirements (SEARS) for the project stated above. This response incorporates comments from DPI Fisheries.

DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitats upon which they depend. To achieve this, DPI Fisheries ensures that developments comply with the requirements of the *Fisheries Management (FM) Act 1994* (namely the aquatic habitat protection and threatened species provisions in Parts 7 and 7A of the Act, respectively), and the associated *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (1999)*. In addition, DPI Fisheries is responsible for ensuring the sustainable management of commercial and recreational fishing in NSW.

The proposed development site is surrounded by coastal wetlands to the north, east and west as listed under the Coastal Management SEPP 2018. The proposed development site is marked with a red star on the map below and coastal wetland data layers are shown.



NSW Department of Primary Industries
Locked Bag 1, Nelson Bay NSW 2315
Tel: 02 4254 5527 Fax: 02 4224 9056
www.dpi.nsw.gov.au

DPI Fisheries requests more detailed information on the extent of the proposed development a whether it falls within the mapped area of coastal wetland or the mapped proximity area for the coastal wetland. The environmental assessment should consider potential flow on effects from site establishment and operational activities, including:

- the use of pesticides and fertilisers on the orchard,
- dust from waste recovery operations and trucks on unsealed roads,
- runoff and leaching of contaminants and chemicals from the site, particularly in relation to the adjacent coastal wetland.

Information requirements that may be of assistance in the preparation of an environmental assessment for this proposal are listed in Attachment 1.

Should you require any further information concerning this proposal, please contact Sarah Conacher on 8437 4981 or sarah.conacher@dpi.nsw.gov.au.

Yours sincerely,



Sarah Conacher
Fisheries Manager, Aquatic Ecosystems Unit

9th August 2018

ATTACHMENT 1

Environmental Assessment Requirements for Resource Recovery Facility – 99 Sargents Rd, Ebenezer

Note: DPI Fisheries recommends that development proposals comply with the *Policy and Guidelines for Fish Habitat Conservation and Management (2013)* (referred to hereafter as P&GLs). A list of general information requirements for developments and standard precautions and mitigation measures are outlined in Section 3.1 of this document. See

<http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fish-habitat-conservation>

A: General Requirements

- site address and contact details.
- property description (e.g. Lot and DP numbers).
- a clear description of the proposal including details of construction methods and materials.
- map(s) of the development area and adjacent areas - this should include nearby waterways, adjacent infrastructure (such as jetties) and land use.
- clear photographs of the site (at low and high tide in estuaries), including photographs of any riparian and aquatic vegetation present (including pest species such as *Caulerpa taxifolia*).
- location of any oyster leases or other aquaculture facilities and recreational and commercial fishing areas within the subject waterway.
- a description of the potential direct and indirect impacts on aquaculture, commercial and recreational fishing from the development.
- a clear description of the physical and hydrological features of the development area (which may extend upstream and downstream of the development site in the case of flowing rivers or tidal waterways).
- approximate depth contours within 20 metres of the proposal.
- a clear description of aquatic environments including:
 - ❑ fish in the locality, including threatened and protected species, populations, ecological communities, pest species or presence of 'critical habitat' under the FM Act or EPBC Act,
 - ❑ an aquatic and riparian vegetation survey map of the area which shows the location and/or coverage of saltmarsh, mangrove, seagrass, macroalgae, macrophytes, riparian vegetation and snags,
 - ❑ description of aquatic habitat TYPE on site (see Table 1 in the P&GLs),
 - ❑ description of the waterway CLASS (see Table 2 in the P&GLs).
- details of the nature, timing, magnitude and duration of the proposed disturbance to the aquatic environment.
- assessments of predicted impacts upon any threatened species (fish and marine vegetation) (i.e. completion of a 7 part test and/or species impact statement(s)) and other aquatic flora and fauna.
- details of any mitigation measures to limit environmental impacts.
- details of the general regional context, any protected areas, other developments in the area, and/or cumulative impacts.
- a copy of the land owner's consent where relevant.
- notification of any other matters relevant to the particular proposal and of interest to NSW DPI.

Dredging and reclamation activities

- purpose of works
- type(s) and distribution of marine vegetation in the vicinity of the proposed works
- method of dredging to be used
- timing and duration of works
- dimension of area of works including levels and volume of material to be extracted or placed as fill
- nature of sediment to be dredged, including Acid Sulphate Soil, contaminated soils etc
- method of marking area subject to works
- environmental safeguards to be used during and after works

- measures for minimising harm to fish habitat under the proposal
- spoil type and source location for reclamation activities
- method of disposal of dredge material
- location and duration of spoil stockpiling, if planned

Activities that damage marine vegetation

- type of marine vegetation to be harmed
- map and density distribution of marine vegetation
- reasons for harming marine vegetation
- methods of harming marine vegetation
- construction details
- duration of works/activities
- measures for minimising harm to marine vegetation under the proposal and details of compensatory habitat development to replace lost vegetation.
- method and location of transplanting activities or disposal of marine vegetation.

B. Aquatic habitat assessment

The aim of the aquatic assessment should be to define the presence of 'key fish habitat' within the study site, adjacent areas (upstream and downstream), and the broader regional area. There may be a range of potential fish habitats that could be impacted by a particular activity. Some points to consider include:

- geomorphic characteristics of the waterway (i.e. what characteristics of a CLASS 1-4 waterway does it have (see Table 2 in P&GLs)? Is it a gully, intermittent stream or major river? Does it have deep pools or in-stream gravel beds? Is it a wetland? Does the watercourse connect with other watercourses upstream or downstream? What is the slope/gradient?),
- is it mapped as key fish habitat? (see www.dpi.nsw.gov.au/fisheries/habitat/protecting-habitats#KFH for maps of key fish habitat per Local Government Area),
- flow regime of the watercourse (e.g. is it an intermittent or permanently flowing stream? What is the range of water velocity of the flow? What are the maximum and minimum or percentile flows (in megalitres/day) for the watercourse?),
- description of local wave and current regimes (in tidal areas),
- description of the water quality (e.g. discolouration, sedimentation, turbidity, pH, dissolved oxygen, nutrients),
- types of surrounding land use (e.g. agricultural, urban, aquaculture),
- condition of riparian vegetation (i.e. present or absent. Are the species native or exotic? Is the density of vegetation thick or sparse?),
- condition of freshwater aquatic vegetation (i.e. present or absent. Are the species native or exotic? Is the density of vegetation thick or sparse? Is it continuous or sparse in coverage? What is the aerial extent of major vegetation types? Is the vegetation healthy or degraded?),
- condition of marine vegetation (i.e. information on type, species, shoot density and/or percentage cover. Is the vegetation continuous or sparse in coverage? What is the aerial extent? Is the vegetation healthy or degraded? Is wrack (dead seagrass or macroalgae) present?),
- presence of wetlands nearby (including freshwater wetlands and saltmarsh) (i.e. are wetlands protected under any legislation (e.g. SEPP 14 coastal wetlands, Ramsar wetlands)? Are the wetlands in a healthy or degraded condition?)
- substrate type (e.g. rock, sand, gravel, silt),
- presence of refuge areas (e.g. adjacent wetlands, upstream pools),
- presence of spawning areas (e.g. gravel beds, snags, reed beds, saltmarshes),
- presence of natural or artificial barriers to fish passage upstream and downstream (e.g. waterfalls, cascades, weirs, dams, floodgates, road crossings),
- types of migratory fish or other aquatic species likely to inhabit the areas (based on known distribution range within the scientific literature),
- timing of construction in relation to any fish migration seasons,
- timing of construction in relation to flow conditions relative to expected wet seasons,
- presence of any listed threatened or protected aquatic species or 'critical habitat' under the FM Act and EPBC Act.

C. Aquatic fauna assessment

For aquatic fauna studies, sites where fish and/or other aquatic fauna are well documented, and no threatened species are recorded, a site inspection and desktop review of the study site and regional area may be the required level of assessment.

During the completion of the planning phase for a new project, it may be determined that a detailed aquatic survey is required. Detailed surveys are to be undertaken only after direct consultation with NSW DPI as permits are required for sampling aquatic fauna under the FM Act. The Department of Planning and Infrastructure has developed a document entitled *Aquatic Ecology in Environmental Impact Assessment* (Lincoln-Smith 2003) which may also assist in the survey design.

Note that a detailed survey may be required:

- a) where the project is on a CLASS 1 or 2 watercourse (see Table 2 in P&GLs) or where it has been identified that there may be a significant impact on a threatened aquatic species; and/or
- b) where the project crosses through, over or within a 'critical habitat' and a Species Impact Statement is required.

D. Assessment of likely impacts

- indicate the location, nature and extent of habitat removal or modification (both direct and indirect) which may result from the proposed action;
- discuss the potential impact of the modification or removal of habitat (potential direct and indirect sources of impact are stated in the letter with this attachment).

Note: In defining the proposal area, discussion must be provided in regard to possible indirect effects of the proposal on species/habitats in the area surrounding the subject site: for example, through altered hydrological regimes, soil erosion or pollution.

E. Ameliorative measures

The environmental assessment should consider and provide detail on how the proposal has been or may be modified and managed to minimise impacts and conserve aquatic habitat on the subject site and in the study area.

F. Project specific requirements

- Every effort should be made to avoid harm to large mangrove trees, including realignment of the boardwalk/pathway to avoid impacts.
- Where harm cannot be avoided, habitat compensation will be required at a minimum ratio of 2:1 (see 3.3.3.2 in P&G). An area of saltmarsh regeneration at the Old Dairy Site may be considered an appropriate compensation for loss of mangroves on the boardwalk route. This area would most likely have been a saltmarsh community prior to disturbance by dairy farming. This compensation proposal would need to be scoped out in consultation with DPI Fisheries.
- Permits must be obtained for reclamation under s200 and for harm to marine vegetation under s205 of the FM Act prior to any work being undertaken.



Department of Planning and Environment
Industry Assessments
PO BOX 39
SYDNEY NSW 2001

Attention: John Booth

Notice Number 1568215
Date 10-Aug-2018

RE: Proposed Resource Recovery Facility - 99 Sargents Road, Ebenezer Hawkesbury (Lot 288 DP 751665) - SEAR 1249

I refer to your request for the NSW Environment Protection Authority's (EPA) requirements for the environmental impact statement (EIS) in regards to the above proposal received by EPA on 27 July 2018.

The EPA understands that Hala Constructions Pty Ltd (the Proponent) is seeking approval to establish a resource recovery facility at 99 Sargents Road, Ebenezer NSW 2756 (the Premises).

The EPA has considered the details of the proposal as prepared by Benbow Environmental on behalf of the Proponent and provided to the EPA by the Department of Planning and Environment. The EPA has identified the information it requires to issue its general terms of approval in Attachment A. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

- 1. Waste Management** – The EIS must include a detailed assessment of the waste management processes to be undertaken at the Premises. This includes but is not limited to:
 - Details of the sources of waste to be received at the Premises;
 - Details of the types and quantities of each type of waste to be received at the Premises;
 - Details of the maximum volume of waste to be stored on the Premises at any one time;
 - Details of the maximum annual throughput of waste for be processed at the Premises; and
 - A description of waste processing procedures for each waste type.
 - A description of how the proponent will meet the EPA's record keeping and reporting requirements, including weighing material in and out of the Premises (refer to the EPA's Waste Levy Guidelines for more information – available at <http://www.epa.nsw.gov.au/your-environment/waste/waste-levy>);
 - A detailed site plan(s) identifying areas for:
 - Haulage;
 - Waste receipt, processing, storage and loading (for each waste type)
 - Quarantine;
 - Infrastructure for environmental controls including dust, noise, water and wheelwash;
 - Weighbridge;
 - Site boundaries;
 - Stormwater drainage areas; and
 - Unused stabilised areas;
 - Details of the type and quantities of materials to be produced and their intended fate;



- Details of any materials produced under a Resource Recovery Order, and the controls in place for meeting the conditions of that order; and
 - A description of procedures for dealing with non-conforming waste (i.e. waste not permitted to be received at the Premises).
- 2. Waste types** – The EPA requires detailed information on the waste types proposed to be received at the Premises. For each waste type, the Proponent must detail the physical and chemical content of the waste, the types of pollution which may result from the storage and processing of that waste and mitigation measures for managing any such impacts. All waste types must refer to a definition in the *Protection of the Environment Operations Act 1997*.
- 3. Wheelwash** - Best practice waste management facilities contain a wheelwash to reduce risk of contaminants being tracked out onto public roads. The EPA notes that the Report does not contain reference to a wheelwash for the site. The Proponent should set out in the EIS whether a wheelwash will be installed and if not, justification as to why a wheelwash will not be installed and how contaminants will be retained and managed onsite without a wheelwash.
- 4. Water flow diagram & water balance** - The EIS should include details of how surface water flows across the site and locations of any drains or storage tanks for stormwater or leachate. The Report mentions a "dust control system" and the use of "fixed sprinklers". Please provide further details about the system and sprinklers, including the source of the water and the receptacles for the resulting water from the system. Provide any details of trade waste agreements.
- 5. Noise** - The Proponent must assess noise impacts and demonstrate effective controls to manage noise impacts, including from traffic, at all receptors. Please refer to Attachment A for detail of what is to be included in the noise impact assessment.

In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in Attachment B 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 Office of Environment and Heritage.

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").

In addition, as a requirement of an EPL, the EPA will require the Proponent to prepare, test and implement a Pollution Incident Response Management Plan and/or Plans in accordance with Section 153A of the Act.

Yours sincerely

Ruth Ower
Acting Unit Head
Waste & Resource Recovery



(by Delegation)



ATTACHMENT A: EIS REQUIREMENTS FOR

**Proposed Resource Recovery Facility - 99 Sargents Road Ebenezer Hawkesbury (Lot 288
DP 751665)**

How to use these requirements

The EPA requirements have been structured in accordance with the DIPNR 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

The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental outcomes.



B The proposal

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 generationsproper 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

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

- 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

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: *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2016); *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (DEC, 2007); *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); Load Calculation Protocol for use by holders of NSW Environment Protection Licences when calculating Assessable Pollutant Loads (DECC, 2009).

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: *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.
- Reference should be made to: *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011); *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (EPA, 2015).

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

- 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

- 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

- Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.

ATTACHMENT B: GUIDANCE MATERIAL

Title	Web address
Relevant Legislation	
<i>Contaminated Land Management Act 1997</i>	http://www.legislation.nsw.gov.au/#/view/act/1997/140
<i>Environmentally Hazardous Chemicals Act 1985</i>	http://www.legislation.nsw.gov.au/#/view/act/1985/14
<i>Environmental Planning and Assessment Act 1979</i>	http://www.legislation.nsw.gov.au/#/view/act/1979/203
<i>Protection of the Environment Operations Act 1997</i>	http://www.legislation.nsw.gov.au/#/view/act/1997/156
<i>Water Management Act 2000</i>	http://www.legislation.nsw.gov.au/#/view/act/2000/92
Licensing	
Guide to Licensing	www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2016)	http://www.epa.nsw.gov.au/air/appmethods.htm
POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/#/view/regulation/2010/428
Noise and Vibration	
NSW Noise Policy for Industry	http://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/noise/constructnoise.htm
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.epa.nsw.gov.au/noise/vibrationguide.htm
NSW Road Noise Policy (DECCW, 2011)	http://www.epa.nsw.gov.au/your-environment/noise/transport-noise
NSW Rail Infrastructure Noise Guideline (EPA, 2013)	http://www.epa.nsw.gov.au/your-environment/noise/transport-noise
Human Health Risk Assessment	



Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards (enHealth, 2012)	http://www.eh.org.au/documents/item/916
Waste, Chemicals and Hazardous Materials and Radiation	
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA, 2016)	http://www.epa.nsw.gov.au/waste/landfill-sites.htm
Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)	http://www.epa.nsw.gov.au/resources/waste/envguidlms/industrialfill.pdf
EPA's Waste Classification Guidelines 2014	http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm
Resource recovery orders and exemptions	http://www.epa.nsw.gov.au/wasteregulation/orders-exemptions.htm
European Unions Waste Incineration Directive 2000	http://ec.europa.eu/environment/archives/air/stationary/wid/legislation.htm
EPA's Energy from Waste Policy Statement	http://www.epa.nsw.gov.au/wastestrategy/energy-from-waste.htm
NSW Waste Avoidance and Resource Recovery Strategy 2014-2021	http://www.epa.nsw.gov.au/wastestrategy/warr.htm
Chemicals subject to Chemical Control Orders	
Chemical Control Orders (regulated through the EHC Act)	http://www.epa.nsw.gov.au/pesticides/CCOs.htm
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
Water and Soils	
Acid sulphate soils	
Coastal acid sulfate soils guidance material	http://www.environment.nsw.gov.au/acidsulfatesoil/ and http://www.epa.nsw.gov.au/mao/acidsulfatesoils.htm
Acid Sulfate Soils Planning Maps	http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.epa.nsw.gov.au/clm/planning.htm

Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.epa.nsw.gov.au/resources/clm/20110650consultantsgline.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.epa.nsw.gov.au/resources/clm/auditorglines06121.pdf
Sampling Design Guidelines (EPA, 1995)	http://www.epa.nsw.gov.au/resources/clm/95059sampgdline.pdf
National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.scew.gov.au/nepms/assessment-site-contamination
Soils – general	
Managing land and soil	http://www.environment.nsw.gov.au/soils/landandsoil.htm
Managing urban stormwater for the protection of soils	http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://australiangeomechanics.org/admin/wp-content/uploads/2010/11/LRM2000-Concepts.pdf
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html
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)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf



REQUEST FOR INPUT INTO SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Development Proposal: Resource Recovery Facility

To: Sydney West Region

File: SEAR 1249

From: DPE Industry Assessments

Date: 27/07/18

Office of Sustainable Development Contact Officer:

Name: John Booth

Phone No: (02) 8275 1281

Secretary's Environmental Assessment Requirements or relevant information has been requested for the preparation of the following (tick applicable):

☒ Environmental Impact Statement	☐ Statement of Environmental Effects	☐ Review of Environmental Factors

Date Information Required By: 10/08/18

[Note: Only fill out responses relevant to your section]

1. LEGISLATIVE FRAMEWORK

Please provide advice on whether the proposed development requires approval/concurrence under one or more of the following:

☒ E P & A Act Part 4 Consent	☐ Native Vegetation Conservation Act
☐ E P & A Act Part 5 Approval	☐ Heritage Act
☐ POEO Act	☐ EPBC Act (Cwth)
☐ Water Management Act	☐ Roads Act
☐ Coastal Protection Act	☐ Mine Subsidence Act
☐ Hunter Water (Special Areas) Regs	☐ Rural Fires Act
☐ NPWS Act	

2. PLANNING INSTRUMENTS, POLICIES & STRATEGIES

2.1. List applicable State, Regional & Local EPIs, DCPs, Policies, or Strategies (including drafts), Water Sharing Plans, Regional Vegetation Management Plans that apply and any particularly relevant provisions

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy No. 19 – Bushland in Urban Areas

State Environmental Planning Policy No. 44 – Koala Habitat Protection

State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy (Rural Lands) 2008

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (No 2 – 1997)

Hawkesbury Local Environmental Plan 2012

The Hawkesbury Development Control Plan 2002

2.2. Is the proposal permissible?

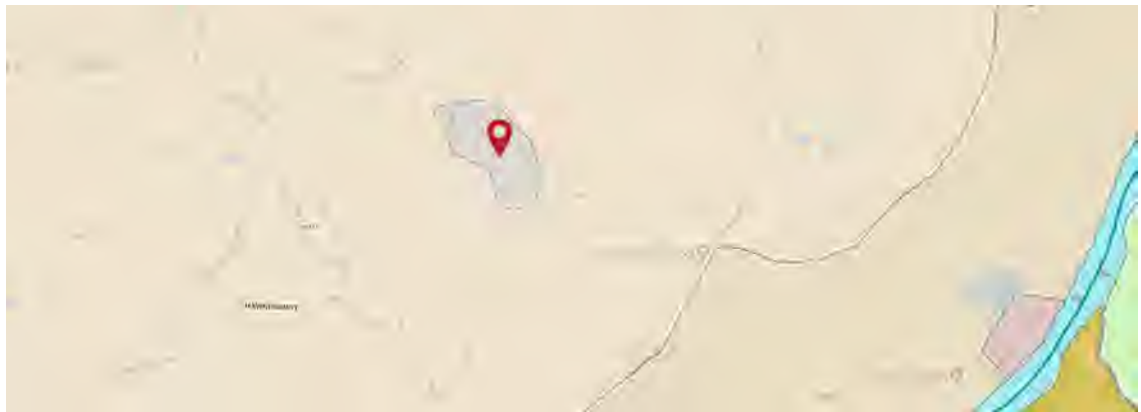
☒ Yes

☐ No

Provide details on the relevant zoning provisions or permissibility. Also, where a project is not clearly in one category, please provide details:

The site is zoned RU1 Primary Production under the Hawkesbury Local Environmental Plan 2012. 'Landscaping material supplies' is permitted with consent in this zone. Resource Recovery (Waste or resource management facility) is not permitted with consent under the Hawkesbury Local Environmental Plan 2012, however, it is permitted under the State and Environmental Planning Policy (Infrastructure) 2007 under Division 23 Waste or resource management facilities.

Note: a zoning map showing the site should be attached



2 Permitted without consent

Bed and breakfast accommodation; Environmental protection works; Extensive agriculture; Home occupations

3 Permitted with consent

Animal boarding or training establishments; Boarding houses; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Caravan parks; Cemeteries; Centre-based child care facilities; Charter and tourism boating facilities; Community facilities; Correctional centres; Crematoria; Dual occupancies (attached); Dwelling houses; Educational establishments; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Flood mitigation works; Food and drink premises; Forestry; Funeral homes; Health consulting rooms; Helipads; Heliports; Home-based child care; Home industries; Hospitals; Intensive livestock agriculture; Intensive plant agriculture; Jetties; Landscaping material supplies; Moorings; Open cut mining; Places of public worship; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers' dwellings; Tourist and visitor accommodation; Truck depots; Veterinary hospitals; Water recreation structures; Water storage facilities

4 Prohibited

Any development not specified in item 2 or 3

2.3. List any relevant concurrence / consultation requirements? (If yes, please identify the instrument and provisions):

See Environmental Protection License under the Protection of the Environment Operation Act 1997 (POEO) & The Protection of the Environment Operations (General) Regulation 2009 (POEO Regulation 2009)

2.4. List any relevant Planning Strategies / Studies or relevant current work items:

A Metropolis of Three Cities - The Greater Sydney Region Plan

Western City District Plan

3. NATURAL RESOURCE STRATEGIES & PLANS

- 3.1. List applicable NSW State Natural Resource Management Policies, Strategies, & Plans (eg Catchment BluePrints, Estuary Management Plans, Coastal Management Plans & Flood Prone Risk Management Plans), NSW Coastal Policy & Flood Prone Land Policy that may apply to the proposal or any relevant provisions:

Managing contaminated land – Planning Guidelines – SEPP 55 Remediation of Land

Hazardous and Offensive Development Application Guidelines - Applying SEPP 33 – January 2011

4. KEY ISSUES

- 4.1. What are likely to be the key issues? Prioritise – high, important, other, and list any specific information including modelling, maps, plans and data collection, that should be considered to address the issue. Information may be attached to this form.

Note: The Office of Sustainable Development has prepared a number of EIS Guidelines for certain types of proposals, activities and issues. A list of the current EIS Guidelines is provided at the end of this Form. If this Form relates to a type of proposal, activity or issue that has an EIS Guideline, it is not necessary for your requirements to duplicate the information covered in the Guideline. However you may still provide a list of the key issues you consider as being important for the proposal or activity to address.

Flooding – site is identified in the Hawkesbury Floodplain Risk Management Study & Plan Volume 1: Main Report as being in an Extreme Flood Risk precinct and High Flood Risk precinct.

The subject site falls within 1 in 100 AEP, 1 in 500 AEP and Probable Maximum Flood zones

Traffic: increased road use

Traffic: transportation of materials via public road ways / through local areas

Acid Sulfate soils – identified in Hawkesbury Local Environmental Plan 2012 Acid Sulfate Soils Map ASS_008C

Wetlands – strong need to protect surrounding wetlands. Site is surrounded by Wetlands as per Hawkesbury Local Environmental Plan 2012 Wetlands Map WET_008C

Potentially hazardous/offensive – noise, odour and dust

Terrestrial Biodiversity – identified in Hawkesbury Local Environmental Plan 2012 Terrestrial Biodiversity Map BIO_008C

Potential for water pollution from run off

Waste management

Bushfire

- 4.2. In your opinion, is the proposal likely to be of local, regional or State interest? Please provide details.

Local interest as it potentially introduces hazardous/offensive factors such as noise, odour and dust. Also, it is in close proximity to wetlands. Additionally, it aims to become a

centre for processing other ENM and VENM, thus will increase the transport of these materials through the region.

- 4.3. For Part 5, where DIPNR is a determining authority, has it considered the need for an EIS

☐

Yes

☐

No

If yes, please detail:

N/A

- 4.4. Does the site have a history that is of relevance to this proposal?

☐

Yes

☒

No

If yes, please detail:

Not known

5. CONSULTATION

- 5.1. Please list any agencies, councils, community group, or other interested parties with whom the proponent should consult.

Environmental Protection Authority

NSW Office of Water

Office of Environment and Heritage

Roads and Maritime Services

Hawkesbury City Council

Inform NSW – Hawkesbury / Nepean Flood Risk Management Directorate

SES

NSW Rural Fire Service (NSW RFS)

6. CONTACT

- 6.1. Please provide the name and contact details of a nominated officer for ongoing liaison with your office.

Name Matthew Black

Contact No. 02 9860 1553

Position Planning Officer

Date 06/08/2018

EIS GUIDELINES

Section A: Chemical, Petroleum, Manufacturing and Materials Processing

- Chemical facilities

- Bitumen works
- Concrete works

Section B: Extractive Industries, Mining and Mineral Processing

- Extractive industries – Quarries
- Extractive industries – Dredging and other extraction in riparian and coastal areas
- Coal Mines and Associated Infrastructure

Section C: Livestock, Agriculture, Aquaculture and Forestry Industries

- Cattle feedlots
- Piggeries
- Poultry farms
- Large Scale Irrigation in the Murray, Murrumbidgee and Darling Basin (Draft)

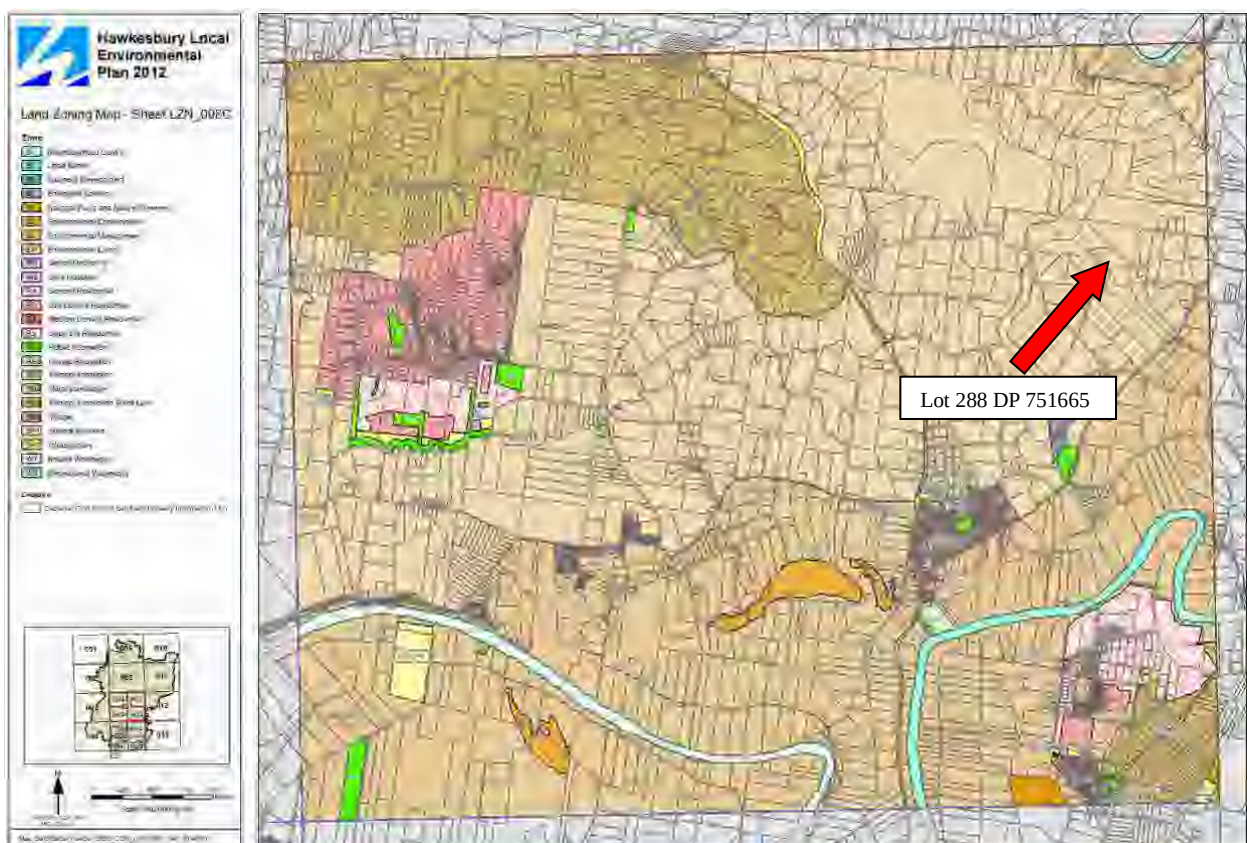
Section D: Transport and Energy

- Roads and related facilities
- Marinas and related facilities
- NSW Wind Energy (Draft)
- Network Electricity Systems and Related Facilities
- Railway Facilities (Draft)

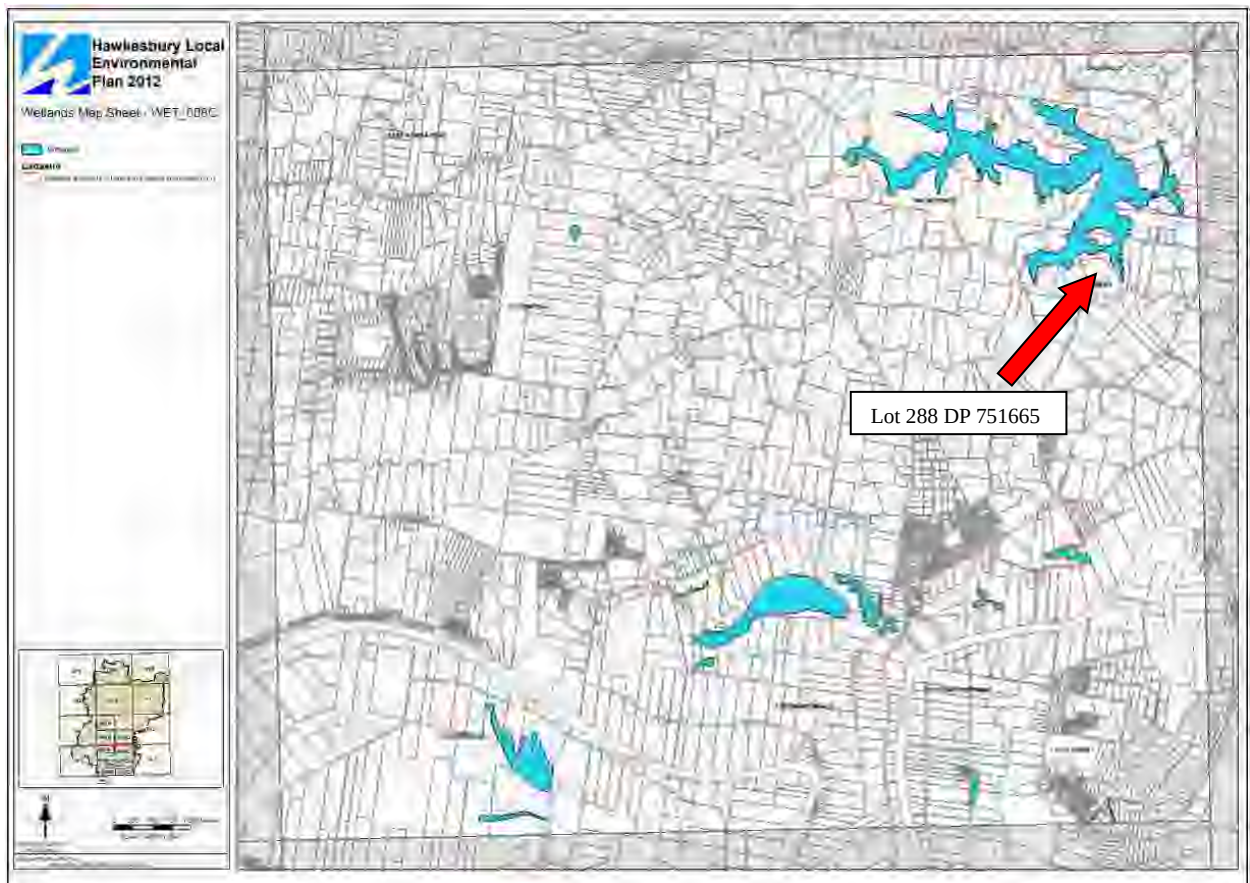
Section E: Water and Waste

- Landfilling
- Composting and related facilities
- Sewerage systems
- Irrigation of sewage effluent
- Aquatic Ecology
- Aquaculture in Natural Waterbodies
- Aquaculture in Land-based Activities

Location of the premises within the Zone RU1 – Primary Production



Location of the premises within the Wetland Map



EIS Attachment 2: NSW RMS SEARs

Sarah New-Beall

From: Pahee Rathan <Pahee.RATHAN@rms.nsw.gov.au>
Sent: Monday, 3 June 2019 8:22 AM
To: Sarah New-Beall
Cc: Linda Zanotto; Emma Hansma
Subject: RE: 99 Sargents Road, Ebenezer (#181084)

Hi Sarah,

I refer to your email below requesting Roads and Maritime's assessment requirements for the proposed landscaping supply and resource recovery facility at 99 Sargents Road, Ebenezer.

Roads and Maritime requires the following issues to be included in the transport and traffic impact assessment of the proposed development:

1. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required).

The following key intersection is to be examined/modelled for performance and compliance with AUSTROADS Guide to Road Design Part 4A: Unsignalised and signalised intersections:

- Sackville Road/Stannix Park Road

SIDRA modelling and swept path plans for the intersection should be submitted to Roads and Maritime for review.

2. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle width, etc).
3. Proposed number of car parking spaces and compliance with the appropriate parking codes.
4. Details of light and heavy vehicle movements (including vehicle type and likely arrival and departure times).

If you like to discuss this matter further, please contact me on 8849 2219.

Regards
Pahee

Pahee Rathan
Senior Land Use Assessment Coordinator
North West Precinct
T 02 8849 2219 M 0417 246 510
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
27 Argyle Street Parramatta NSW 2150

From: Sarah New-Beall [<mailto:SNew-Beall@benbowenviro.com.au>]
Sent: Thursday, 16 May 2019 3:10 PM
To: Development Sydney

Cc: Linda Zanotto; Emma Hansma
Subject: 99 Sargents Road, Ebenezer (#181084)

Dear RMS,

Please find attached a letter with scoping report regarding a proposed landscaping supply and resource recovery facility at 99 Sargents Road, Ebenezer. This is a request for the RMS to provide assessment requirements that need to be addressed in an Environmental Impact Statement.

If you have any queries, please do not hesitate to contact the office.

Kind regards,

Sarah New-Beall

Receptionist
on behalf of



25-27 Sherwood Street
Northmead NSW 2152
t: 02 98960399
f: 02 98960544
email: snew-beall@benbowenviro.com.au
website: www.benbowenviro.com.au



Before printing, please consider the environment

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EIS Attachment 3: Community Consultation Sheet

Proposed Landscaping Supply & Resource Recovery Facility

99 Sargents Road, Ebenezer

COMMUNITY INFORMATION SHEET

HALA CONSTRUCTIONS PTY LTD is proposing to develop their land holding at 99 Sargents Road, Ebenezer for a landscaping supply and resource recovery facility. The land is located within the Hawkesbury Local Government Area, in the suburb of Ebenezer in Sydney's north-west and is within a primary production area. An Environmental Impact Statement (EIS) for the proposal is currently being prepared for submission to Hawkesbury City Council. The EIS will be exhibited for a designated 30 day period, at which time the community are invited to make submissions.

About Hala Constructions

Hala Constructions is a family owned business that has been operating for over 30 years. Hala Constructions undertakes excavation and demolition works in the building industry and specialises in demolition, bulk & detail excavation, bored piling, piling, capping beams, anchors and shotcrete works.

The Subject Site

The site is located at 99 Sargents Road, Ebenezer. The land is approximately 15 hectares in area and is located with frontage to Sargents Road to the south-west. The proposed use would be undertaken in the centre of the site as shown in Figures 1 and 2.



Figure 1: Site Location. Site Boundary is shown in red. (Source: Six Maps)

The Proposed Development

Hala Constructions proposes to operate a landscaping supply and resource recovery facility using virgin excavated natural materials (VENM), excavated natural materials (ENM) and demolition materials. The materials will be sourced from job sites where Hala Constructions operate, but will also be sourced from other sites needing to remove this material. Screening and crushing is proposed to occur inside a purpose built shed on site. Approval is sought for an annual throughput of 20,000 tonnes per year. There will also be landscaping to create terraces for orchards.



Figure 2: Example of a project by Hala Constructions
Visit: www.halaconstructions.com for details.



Figure 3: Aerial Photograph showing location of operational area on site.

Proposed Landscaping Supply & Resource Recovery Facility

99 Sargents Road, Ebenezer

COMMUNITY INFORMATION SHEET

Description of Operations

RESOURCE RECOVERY

The operation of the facility involves the following activities to be undertaken on site:

- Unloading and loading of materials;
- Material crushing, screening and separating;
- Material storage and stockpiling.

Trucks will enter the site from Sargents Road via a weighbridge and unload materials into the processing shed. VENM, ENM and demolition materials will be screened, crushed and sorted to produce recovered aggregates and recovered fines. Material will be transferred by front end loader to stockpiles on site.



LANDSCAPING SUPPLY

Materials will then be stored in stockpiles, or transferred out to market. Tonnages of materials to be brought to site for resource recovery would amount to 20,000 tpa. Quantity of materials stockpiled could reach a maximum of 5,000 tonne at any one time.

ORCHARDS

Terracing the sloped land of the western half of the site would allow ease of access for agricultural equipment. VENM will be used as fill material to create the terraced areas for the orchards.

Project Benefits

The project would provide a number of benefits including:

- Diverting waste from landfill;
- Fulfil the principles of ecological sustainable development; and
- Generate local employment opportunities.

Hours of Operation

The facility seeks approval to operate from 7am to 6pm Monday to Friday and 8am to 4pm Saturdays.

Environmental Considerations

The environment will be carefully considered at each stage of planning. Key environmental issues that will be addressed in the EIS include:

- **Waste Management** – the facility will reuse materials that otherwise would be sent to landfill and conform to the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.
- **Air Quality** – the operations may generate dust emissions during screening, crushing and handling. An air impact assessment would be conducted and mitigation measures implemented to minimise emissions of dust.
- **Soil and Water** – a preliminary assessment will identify management strategies for and environmental safeguards required. A sediment and erosion control plan will be put in place to minimise the potential for pollution.
- **Noise** – a noise impact assessment would be conducted and controls recommended to ensure noise limits are adhered to.

Other issues to be addressed in the EIS include:

- Traffic and Transport
- Hazards and Risk including bushfire & fire risk
- Visual Amenity
- Biodiversity & heritage

Environmental safeguards and controls would be designed into the facility to minimise impacts.

For more information

Contact Benbow Environmental, details below.



Benbow
ENVIRONMENTAL

A.B.N. 17 160 013 641

Head Office:

25-27 Sherwood Street Northmead NSW 2152 Australia
P.O. Box 687 Parramatta NSW 2124 Australia
Telephone: +61 2 9896 0399 Facsimile: +61 2 9896 0544
E-mail: admin@benbowenviro.com.au

Visit our Website at www.benbowenviro.com.au

EIS Attachment 4: Coolfog System



“Providing Temperature, Dust and Odour Control Solutions for Various Industries”

Access Environmental Systems offers new technology, providing temperature, dust and odour control solutions. Coolfog™ provides effective answers to managing your industrial site and has been installed in numerous foundries, waste facilities, factories and quarries throughout Australia, New Zealand, India, UAE, Saudi Arabia, Oman, England, Scotland, Spain and Canada. Coolfog™ has also been adopted by Australia's largest municipality authority, the Brisbane City Council. Access Environmental Systems designs, manufactures, installs and services Coolfog™ systems, ensuring temperature, airborne dust and odours are dramatically reduced on your site.

How Does Coolfog™ Work?

Coolfog™ pressurises water to 1000 PSI, through uniquely designed nozzles, producing minute water droplet particles that evaporate into the atmosphere within seconds thus reducing the surrounding temperature by up to 10 degrees.

Similarly, this output of water fog encapsulates dust particles making them too heavy to remain airborne, suppressing them safely to ground. Coolfog™ reduces the risk of dust particulates entering adjoining industrial and residential properties creating a healthier environment for all employees and neighbours.

Plant odours are controlled by introducing liquid odour neutralisers into the Coolfog™ water supply. Once the water is fogged into the atmosphere the odour control product neutralises odours, improving both the working environment and its surroundings.

Making industries productive and harmonious with residential expansion

Foundry and waste industries are witnessing mounting legal challenges from local, state and federal legislative and EPA groups, due to emissions. Issues of dust, heat and odours will be overshadowed by productivity inefficiencies if not effectively managed now. Quarries witness considerable downtime and lower productivity using traditional dust bag collection methods. Issues including dust disposal, bag maintenance and breakages all lead to inefficiencies. Residential sprawl is also creating new challenges in the way industries manage and suppress dust in the suburban landscape.



Major benefits of using the Coolfog™ system include:

- Easily adaptable to all production facilities and site applications.
- Environmentally friendly.
- Highly efficient with client feedback reporting significant temperature, dust and odour reductions.
- Very economical on water consumption.
- Minimal downtime and maintenance.
- User friendly components.
- Assists companies to comply with legislative requirements
- Minimises the impact of dust and odour on neighbours
- Improves the working environment and company image
- Will not block screening plants.
- Ideal for use with mains, rain, bore, creek or dam water.

Coolfog™ Testing – Environmentally Friendly and Effective

Independent tests conducted by ‘Airlabs Environmental’ confirm Coolfog™ is highly effective in reducing airborne dust. Particle sizes of 10 microns are reduced by 69.23%, while particles sizes of 2.5 microns are reduced by a huge 74.5 %. Water is undoubtedly our most valuable resource. Excess water usage is greatly reduced when using Coolfog™.

A typical foundry application will use between 11- 40 litres per minute, making it economical to use on mains water supply. Traditional spray mechanisms on quarry sites consume large volumes of water, up to 40-60 litres per minute, per application point. Coolfog uses a mere 18 litres per minutes on 4 to 6 typical application points.

Applications where Coolfog™ can be used

Agricultural Storage	Horticultural Storage	Quarries
Amusement/Theme Parks	Hotels/Resorts	Recycling Industries
Aviaries	Hydroponics	Restaurants/Cafes
Botanical Gardens	Kennels	Rotomolding
Cardboard Manufacturing	Livestock	Sporting Venues
Dairy Cattle	Mining	Steel Mills
Equestrian Centres	Movie Production	Storage Warehouses
Factories	Oil Drilling Rigs	Tile Manufacturing
Fertilizer Manufacturing	Outdoor Areas	Transfer Stations
Foundries	Paper Manufacturing	Viticulture/Vineyards
Gas Turbine Inlet Air Cooling	Paper Mills	Wine Barrel Rooms
Greenhouses	Patios	Workshops
Horse Stables	Piggeries	Zoos

Access Environmental Systems

Unit 5/23 Kenworth Place

Brendale QLD. 4500

Ph: +61 7 3881 3262

Fax: +61 7 3881 3265

Email: sales@coolfog.com.au

Web: www.coolfog.com.au



EIS Attachment 5: EL Water Recycling Plant Specification Sheet



EL WATER RECYCLING PLANT

High capacity, low maintenance water recycling plant engineered to treat and recycle most wash bay and industrial wash effluents.

OVERVIEW

Enviro Concepts Water Recycling Plants are high capacity water filtration and polishing systems designed to remove suspended solids, oil & grease, BOD, COD, and metals from most wash bay and industrial wash effluents to produce high quality water suitable for re-use.

These containerised or skid mounted plants are pre-engineered, pre-assembled and factory tested minimising site installation and start-up time. Designed for minimal operator involvement and low operation and maintenance costs.

The EL range incorporates proven water pH correction and disinfection systems, high capacity oil-water separation and advanced media and/or membrane filtration in a packaged system that is adaptable for most wash water effluents and water recycling requirements.

APPLICATIONS

- Treatment for Mine Vehicles and Equipment
- Industrial and Mechanical Wash Treatment
- Light and Heavy Vehicle Washdowns
- Storm and Ground Water Treatment
- Logistics and Hire Companies
- Quarantine & Weed/Seed Hygiene
- Energy Suppliers, Resource Industry
- Recycled Water Treatment

FEATURES

- Containerised or Skid Mounted
- Effluent Collection and Solids Settling Tanks
- pH Correction System
- Chlorine or UV Disinfection System
- Continuous Media Solids Filter
- High Capacity Oil-Water Separator
- Deep Bed Media Filtration
- Polishing Process Tank
- Recycle Water Feed Pump

OPTIONS

- Dissolved Air Flotation (DAF)
- Ultrafiltration (UF)
- Reverse Osmosis (RO)
- Water Softening
- Ion Exchange (IX)
- Bio Reactor

SPECIFICATION

Model	EL Range
Feed Water Source	Industrial wash effluent, wash bay effluent, mine vehicle wash effluent, etc.
Flow Capacity	EL25: 25L/min EL50: 50L/min EL100: 100L/min
Dimensions	6m x 2.4m 2.4m (Containerised), 2.3m x 1.1m x 2.2m (Skid-Multiple)
Dry Weight	Approx. 5 Tonne
Power Requirements	240 or 415 volt, 43 Amps, 5.0 kW
Operating pH	6 to 10 pH (pH correction will eliminate pH inconsistencies of raw effluent)
Operating Temperature	Maximum 40 deg C (higher temperature can emulsify the oils and grease)
Inlet - Suspended Solids	200 to 1,500 mg/L (with peaks up to 5,000 mg/L)
Inlet - Fats, Oils & Grease	200 to 2,000 mg/L (with peaks up to 5,000 mg/L)
Filtration Pore Size	15 µm for the CMS 5 to 10 µm equivalent pore size for the Deep Bed Media Filter
Suspended Solids Reduction	Up to 95% (for EL100)
BOD, COD reduction	Up to 80% (with Bioreactor option)
Fats, Oils and Grease reduction	Up to 95% (for EL100)

CUSTOMISE YOUR WATER RECYCLING PLANT

EnviroConcepts' standard recycling plant is designed for most wash bay and industrial wash effluents. From our range of water treatment and filtration products, we can customise your plant to find the right solution for your needs.

Components	Standard EL100	Options & Upgrades
Flow Capacity	100 L/min (6 m ³ /hr)	25 50 or 100/min
Equalisation & Effluent Storage	Solids Settling Tank	Single or multiple
Solids Removal	CMS Filter	DAF
Oil Removal	Oil-Water Separator	DAF
Metals Removal		DAF
Biological Treatment		Bioreactor
Water Polishing	Deep Bed Media Filter	Water Softening Ion Exchange
Membrane Filtration		UF RO
Disinfection System	Chlorine Dosing	UV Disinfection
Chemical Dosing System	pH Correction System	Coagulant Dosing (for DAF) Flocculant Dosing (for DAF) Antiscalant Dosing (for RO) SMBS Dosing (for RO)
Chemical Requirements	EnviroBase EnviroAcid Enviro Chlor	EnviroCoag EnviroFloc Antiscalant SMBS
Media Requirements	CMS Filter Paper EnviroDex	Ion Exchange resin
Installation	Containerised	Skid Mounted

EIS Attachment 6: Sika Dust Seal

Sika® Dust Seal

Dust suppressant and soil stabiliser

Construction

Description	Sika Dust Seal is produced from lignosulphonates with outstanding properties for dust binding. It can be used to eliminate dust problems in connection with unpaved roads, finely divided coal and mineral ores. Sika Dust Seal also has very good soil stabilisation properties on unimproved roads producing a hard and durable surface. It is also recommended for road edge sloping and gives good protection against soil and sand erosion in rural and desert areas.
Uses	Sika Dust Seal has a diverse range of dust binding applications. It can be used on: • Dirt and gravel roads. • Unpaved roads. • Unimproved roads. • In rural and desert regions Sika Dust Seal is used in these areas when the amount of traffic found on unsurfaced roads (where dust is not bound) increases to a point where road maintenance and repair costs escalate.
Advantages	• Forms a hard, firmly bound surface that adds traction, safety and comfort for vehicles. • Eliminates the sliding hazards of loose aggregate by binding with road soil into hard skid resistant surface. • Increases the load-bearing strength of all types of road soils, whether wet or dry. • Binds dust particles to the road. Stops dust clouds thus improving driving comfort and safety. • Holds the road material on the road and allows building of the road stages. Aggregate is bound into the road surface and cannot be thrown by traffic reducing the hazard of broken windscreens • Decreases the rate of water penetration into the road, increases run-off and reduces mud condition. • Reduces heaves and breakup due to seasonal change in weather conditions. • Roads sealed with Sika Dust Seal may be used immediately after treatment. This allows the treatment of vital transportation arteries and detours without tying up traffic. • Can be applied easily and cheaply with equipment commonly available and used for regular road maintenance.
Storage and Shelf Life	Stored at temperatures between 5°C and 35°C in unopened original containers protected from direct sunlight and frost, shelf life is at least one (1) year
Instructions for Use	
Application	Sika Dust Seal is best applied when the surface of the soil is slightly damp. If binding soil is to be added, spreading should take place shortly afterwards. Under normal conditions, best results are obtained when the road surface is watered shortly before the spreading of Sika Dust Seal. Watering should be a light sprinkling of approximately 0.5 to 1 litre of water per square meter.



Application Procedure

Construction

1. Grade the road to remove all corrugations and potholes, and to loosen the road surface material to the desired depth of penetration. Some roads work easier if a light application of Sika Dust Seal is used before the first grading to soften the surface.
2. Blade most of the loose material into windrows on both sides of the road to prevent run-off of valuable Sika Dust Seal and to assure uniform penetration down into the subsurface.
3. After the windrows are formed. Sika Dust Seal is applied by spraying it on the road from a tank truck. The rate of application can be regulated by valves or truck speed with gravity flow equipment. Pressure regulated trucks can also be used. For best results, Sika Dust Seal should be thoroughly mixed with the soil. For stabilisation of the top 70 – 80 mm of the road material, the following steps are commonly used to ensure good mixing:
 - a) Spray $\frac{1}{3}$ to $\frac{1}{2}$ of the Sika Dust Seal specified for total treatment between windrows.
 - b) Blade windrows to the centre, spreading evenly.
 - c) Spray approximately $\frac{1}{3}$ of the total specified Sika Dust Seal on the surface, and blade or mechanically mix with a grader or pulveriser. Save part of the Sika Dust Seal for final top dressing treatment.
4. The road is now ready for the final forming. Since rapid surface drainage normally is important to lignin treated roads, the best type of crown is a modified A type slope of the road. This crown is also favourable when using Sika Dust Seal though it is not critical.
 The rounded crown commonly used is not favourable for lignin treated roads, as it allows pools of water to collect on the relatively flat centre part of the road. This standing water can increase the plasticity of the road material to the point where traffic can cause potholes to develop.
5. After the final shaping and formulation of the A type crown, a top dressing of Sika Dust Seal should be used to touch up any dry spots which might have been exposed during grading. This should be a relatively light spray, especially when the soil is wet, in order to avoid excess surface plasticity and run-off of valuable binder.
6. The final step is compaction. This is best done with a multiple wheeled roller, but very satisfactory results can be obtained by letting traffic do the compaction. Compaction should be done before Sika Dust Seal dries ie. while the road material is still somewhat plastic.

Sika Dust Seal can be used also for stabilising base courses prior to covering the bituminous or concrete wearing mat, because it adds stability to the sub-surface and useful life to the mat. In this case it is desirable to add aggregate and stabilise the top 250 – 300 mm of the road to provide a good hard wearing surface. The strength of a well graded soil is increased in direct proportion to the quantity of Sika Dust Seal added.

Maximum strength improvement comes with between 2 and 3 percent by weight of Sika Dust Seal in the soil



Consumption

The quantity of Sika Dust Seal used depends largely on the kind of road required and the road material itself.

Soil Classification	First Spreading Sika Dust Seal 1/m ²	Maintenance Spreadings Sika Dust Seal 1/m ²
Mainly dust suppression		
- plastic	0.25 – 0.50	0.15 – 0.25
- slightly or non-plastic	0.50 – 0.80	0.25 – 0.40
Mainly soil stabilisation	0.80 – 1.60	0.30 – 0.50

Technical Data (Typical)

Form	Liquid
Colour	Brown
Density (20°C)	1.07kg/litre approximately
pH Value (20°C)	7.0 ± 1.0
Packaging	205 litre drum Bulk deliveries

Handling Precautions

- Avoid contact with skin and eyes.
- Wear protective gloves and eye protection during work.
- If skin contact occurs, wash skin thoroughly.
- If in eyes, hold eyes open, flood with warm water and seek medical attention without delay.
- A full Material Safety Data Sheet is available from Sika on request.

Important Notification

The information, and, in particular, the recommendations relating to the application and end-use of Sika's products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. All orders are accepted subject of our terms and conditions of sale. Users should always refer to the most recent issue of the Technical Data Sheet for the product concerned, copies of which will be supplied on request.

PLEASE CONSULT OUR TECHNICAL DEPARTMENT FOR FURTHER INFORMATION.



Construction



Sika Australia Pty Limited
ABN 12 001 342 329

www.sika.com.au
Tel 1300 22 33 48

Sika® Dust Seal
Page 4 of 4

EIS Attachment 7: Pre-Lodgement Advice

Your Ref:
Our Ref: PD0075/19



17 December 2019

Hala Constructions
94 Railway Street
YENNORA NSW 2161

Dear Sir/Madam

Pre-Lodgement Meeting No: PD0075/19
Property Details: Lot 288 DP 751665 Vol 6580 Fol 23
99 Sargents Road EBENEZER NSW 2756

Reference is made to your meeting with Council's Pre-Lodgement Advisory Panel on 28/11/2019 to discuss a proposal for Landscaping Material Supplies and Resource Recovery Facility at 99 Sargents Road EBENEZER NSW 2756. Council Officers Natalie Piggott, Sanzida Alam and Naomi O'Brien were in attendance.

Pre-Lodgement Proposal

The purpose of the pre-lodgement meeting was to discuss the rejection letter dated 16 September 2019 which outlined reasons given for the development application being rejected.

DA0378/19 was lodged with Council on 2 September 2019 for Designated and Integrated development proposing the following:

- Establishment of a landscape supply business and resource recovery facility to accept VEM, ENM, Concrete, Bricks and green waste for processing;
- Construction of buildings to carry out processing works;
- Construction of new driveway and parking areas;
- Associated landscaping and stormwater management.

The application was rejected with reasons given and the following headings are used to discuss the issues arising from this letter:

1. Hawkesbury LEP 2012 - Objectives

Whilst it is acknowledged that the permissibility for the proposal is provided under SEPP Infrastructure 2007, it is confirmed that Council requires the application to address the zone objectives to demonstrate that the proposed development is consistent with the rural zoned locality.

It was advised by the applicant at the meeting that, whilst the SEPP does override the Local Environmental Plan in terms of permissibility, addressing the zone objectives could be accommodated.

2. Registered Quantity Surveyor's Detailed Cost Report

The applicant requested confirmation on whether a quantity surveyor report was required as the materials to be used for the proposal were to be owner source. It is advised that the materials used for the proposed development must reflect market rate or value of development.

3. Bushfire Assessment Report – Asset Protection Zones and Proposed Tree Removal to be Detailed

As detailed in the rejection letter, the plans must detail the asset protection zones for the proposal, in particular, the landscape plan. The Landscape Plan must detail whether any trees or vegetation are to be removed as a result of the asset protection zones applicable to the site.

It was advised that the landscape plan had not been assessed by the Bushfire Consultant as it was not listed in the plans sited and only a sketch was provided in the report.

ALL plans must be reviewed and certify by the Bushfire Consultant on their certificate.

The Bushfire Consultant is to make recommendations on the location of screen plantings and certify that it is in accordance with *Planning for Bushfire Protection 2019*. This is to be reflected on the Landscape Plan.

4. Flora and Fauna Assessment

As discussed at the meeting, whilst the site is not mapped under the NSW Biodiversity Values map, it is mapped under Council's terrestrial biodiversity maps as containing endangered ecological communities. This map is located under Clause 6.4 of LEP 2012 reference number BIO_008C.

Accordingly a Flora and Fauna Assessment is required to be submitted, as detailed in the rejection letter dated 16 September 2019.

It is noted that the arborist report has provided details on the trees to be removed. The Flora and Fauna Assessment is to assess the significance of the trees proposed for removal and whether any trees to be removed that should be retained for ecological purposes.

5. Erosion and Sediment Control Plan

As confirmed in the meeting, an erosion and sediment control plan is required at DA stage.

6. Site Plan, Colours and Materials Schedule and Statement of Environmental Effects

It was advised at the meeting by the applicant that the above matters would be addressed in the updated documentation.

CONCLUSION

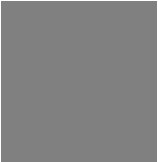
While the pre-lodgement meeting and these minutes attempt to identify significant issues during the initial phases of an application, this letter should not be construed as support or otherwise of the proposal tabled at the meeting. A full assessment can only be made upon submission of a development application.

All other issues raised in the pre-lodgement meeting minutes of PD0008/18 remain relevant. If you have any questions in relation to this matter please contact me.

Yours faithfully

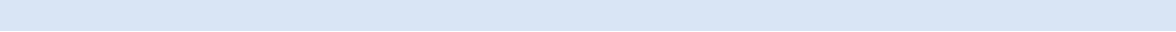
Natalie Piggott | Senior Town Planner | Hawkesbury City Council

☎ (02) 4560 4573 | 📠 (02) 4587 7740 | 🌐 www.hawkesbury.nsw.gov.au



DISCLAIMER

All efforts are made to identify issues of relevance and likely concern with the preliminary proposal. However, the comments and views in this letter are based only on the plans and information submitted for preliminary assessment and discussion at the Pre DA consultation. You are advised that: -

- The matters discussed and advice provided during the meeting was preliminary in nature and a detailed assessment of the proposal is only able to be undertaken with the lodgement of a development application.
 - Given the complexity of issues often involved and the limited time for full assessment, no guarantee is given that every issue of relevance will be identified;
 - Additional matters not identified or discussed during the meeting may be raised in the future and you may be requested to modify the proposal or provide additional information in this regard.
 - Amending one aspect of the proposal could result in changes which would create a different set of impacts from the original plans and therefore require further assessment and advice;
 - This Pre-DA advice does not bind Council officers, the elected Council members, or other bodies beyond Council in any way whatsoever.
- 

Our Ref: PD0008/18

27 February 2018



Mr K Langford
KDC Pty Ltd
Suite 2B, 125 Bull Street
NEWCASTLE WEST NSW 2302

Dear Sir,

Pre-Lodgement Meeting No: PD0008/18
Property Details: 99 Sargents Road EBENEZER NSW 2756
(Lot 288 DP 751665)

Reference is made to your meeting with Council's Pre-Lodgement Advisory Panel on 1 February 2018 to discuss a proposal for the operation of a landscaping material supplies premises at 99 Sargents Road, Ebenezer. Council Officers William Pillon, Ronald Brear and Andrew Johnston were in attendance.

Please find below a summary of the matters discussed at this meeting:

1. The subject land is zoned RU1 Primary Production under the provisions of Hawkesbury Local Environmental Plan (LEP) 2012.

The Dictionary of the Hawkesbury LEP 2012 provides the following definition for 'landscaping material supplies':

landscaping material supplies means a building or place used for the storage and sale of landscaping supplies such as soil, gravel, potting mix, mulch, sand, railway sleepers, screenings, rock and the like.

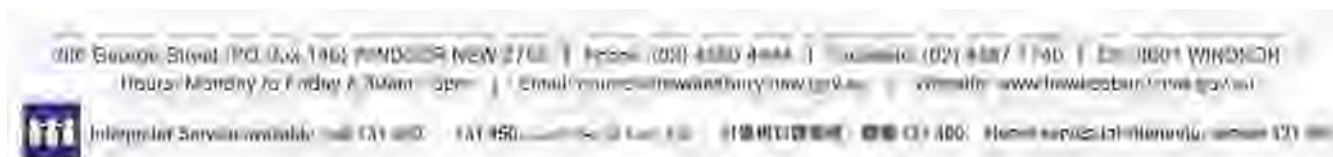
Landscaping material supplies are permissible with consent within the RU1 Primary Production zone.

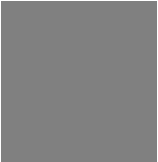
Any application must categorise and demonstrate the permissibility of the development. Details regarding the operation of the proposed business must be supplied to demonstrate that the use satisfies the above definition of landscaping material supplies.

2. During the meeting it was suggested that in the long-term it was also intended to use the property to screen and process demolition and construction waste. Such activities would typically be categorised as a 'resource recovery facility', which are a type of 'waste or resource management facility':

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

waste or resource management facility means any of the following:



- 
- (a) *a resource recovery facility,*
 - (b) *a waste disposal facility,*
 - (c) *a waste or resource transfer station,*
 - (d) *a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).*

Waste or resource management facilities are permissible with consent under Clause 121(2)(a) of State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP).

Whilst permissible, concerns are raised that a resource recovery facility would be more industrial in character and would likely generate significant amenity impacts in this rural location. Such a use would not be consistent with the objectives of the RU1 Primary Production zone.

3. Operating details for the business must be identified, including hours of operation, staff numbers, truck numbers, sizes and movements, materials sold, processing capacities, complaints handling etc.
4. Any application involving 'crushing, grinding or separating works' or 'waste management facilities or works' must address the relevant provisions of Schedule 3 of the Environmental Planning and Assessment (EP&A) Regulation 2000. Where a proposal is categorised as 'designated development' on account of processing capacities, its location or other relevant matters the Secretary's Environmental Assessment Requirements (SEARs) would need to be obtained from the Department of Planning and Environment prior to lodgement with Council.
5. Any application involving 'crushing, grinding or separating' or 'waste processing (non-thermal treatment)' activities must address the relevant provisions of Schedule 1 of the Protection of the Environment Operations (POEO) Act 1997. Where a proposal is categorised as a 'scheduled activity' on account of processing capacities, its location or other relevant matters the application will require referral to the Environment Protection Authority (EPA) as 'integrated development'.

Where required a cheque for \$320.00, made out to the EPA, will be required for this referral. An administration fee of \$140.00 would also be payable to Council for this referral.

6. The subject land is located below the adopted 100 year Average Recurrence Interval (ARI) flood level of approximately 13m AHD. The application will need to demonstrate that the proposed development is consistent with the flood planning provisions of Clause 6.3 of the Hawkesbury Local Environmental Plan (LEP) 2012 and Council's Development of Flood Liable Land Policy.

Stockpiles should generally be located above the adopted 100 year ARI flood level.

7. Sargents Road is unsealed and in its current condition would be unsuitable for use by heavy vehicles. The sealing of Sargents Road would therefore be required from Stannix Park Road to the subject property should the operation of a landscaping material supplies premises or resource recovery facility be nominated.

The access driveway to the property would also need to be sealed to reduce dust impacts.

8. Details of any heavy vehicles servicing the property shall be provided. Swept paths demonstrating that the heavy vehicles can enter and exit the property in a forward direction and manoeuvre within the site shall be provided.
9. Landscaping buffers should be established to soften and screen the development and mitigate potential dust impacts.
10. Any vegetation to be removed must be clearly identified.



The removal of stands of native vegetation will require the submission of a Flora and Fauna Report demonstrating that the proposed development would have no significant impact on threatened species, communities or populations or their habitats. The report is to be prepared in accordance with the Department of Environment and Heritage's Threatened Species Assessment Guidelines.

Please note that Council's vegetation mapping identifies Shale Sandstone Transition Forest (High Sandstone Influence) as being present on the property. Shale Sandstone Transition Forest (High Sandstone Influence) is listed as an Endangered Ecological Community under Schedule 2 of the Biodiversity Conservation Act 2016.

11. An Acoustic Report prepared by a suitably qualified Acoustic Engineer would need to be submitted in support of any application for a landscaping material supplies premises or resource recovery facility. The report must demonstrate that the cumulative impact of noise from all proposed activities on the site on nearby residential properties satisfies the NSW Industrial Noise Policy.

Concern is raised that the operation of the development during the night time period may adversely impact upon the amenity of the neighbourhood on account of the property's location.

12. Stormwater management and water quality will need to be addressed as part of any application.
13. Any Development Application shall provide an assessment against:
 - a) Schedule 3 of the EP&A Regulation 2000;
 - b) Schedule 1 of the POEO Act 1997;
 - c) Hawkesbury LEP 2012;
 - d) Infrastructure SEPP;
 - e) State Environmental Planning Policy No. 55 – Remediation of Land (SEPP No. 55);
 - f) State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP No. 64); and
 - g) Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (SREP No. 20).
14. Any Development Application shall provide an assessment against the Hawkesbury Development Control Plan (DCP) 2002, in particular:
 - a) Part C Chapter 2 – Car Parking and Access;
 - b) Part C Chapter 3 – Signs;
 - c) Part C Chapter 4 – Soil Erosion and Sediment Control;
 - d) Part C Chapter 7 – Effluent Disposal; and
 - e) Part C Chapter 8 – Management of Construction and Demolition Waste.
15. Any development application is to be accompanied by three copies of the following:
 - a) Site plan;
 - b) Floor plans;
 - c) Elevation and section plans;
 - d) Site analysis plan;
 - e) Statement of Environmental Effects;
 - f) Acoustic Report;
 - g) Flora and Fauna Report (depending upon the extent of works)
 - h) Concept landscaping plan;
 - i) Concept drainage plan; and
 - j) Schedule of external materials, finishes and colours.

All documentation should also be provided electronically on a disc or memory stick in accordance with Council's file formatting requirements.

16. Section 94A Contributions may be imposed based on the value of works under Council's Section 94A Development Contributions Plan 2015. Alternatively, heavy haulage contributions may be imposed under the Section 94 Development Contributions Plan 2015.

This letter should not be construed as support or otherwise of the proposal tabled at the meeting. A full assessment can only be made upon submission of a development application.

If you have any questions in relation to this matter please contact the undersigned on (02) 4560 4549.

Yours faithfully,

Andrew Johnston | Senior Town Planner | Hawkesbury City Council

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