

8 October 2021

Enquiries: Jenny Elphinstone
Our Ref: MCUC 2021_4080/1 (Doc ID 1039306)
Your Ref: MOSSL27RP804231

CocoNutz Australia Pty Ltd
(C/o Canberra Town Planning)
C/- Wolter Consulting
Level 2, 1 Breakfast Creek Road
Newstead QLD 4006

Email: mdargusch@wolterconsulting.com.au

Attention: Mr Michael Dargusch

Dear Sir

**Development Application for Material Change of Use for a
Research & Technology Industry- (Pilot Plant)
At 1 Kidd Street Mossman
On Land Described as Lot 27 on PTA on RP804231**

Please find attached the Decision Notice for the above-mentioned development application.

Please quote Council's application number: MCUC 2021_4080/1 in all subsequent correspondence relating to this development application.

Should you require any clarification regarding this, please contact Jenny Elphinstone on telephone 07 4099 9444.

Yours faithfully



For
Paul Hoyer
Manager Environment & Planning

cc. State Assessment and Referral Agency (SARA) E: CairnsSARA@dilgp.qld.gov.au
encl.

- Decision Notice
 - Approved Drawing(s) and/or Document(s)
 - Concurrence Agency Response
 - Reasons for Decision
- Advice For Making Representations and Appeals (Decision Notice)
- Adopted Infrastructure Charges Notice
- Advice For Making Representations and Appeals (Infrastructure Charges)



Decision Notice

Approval (with conditions)

Given under section 63 of the Planning Act 2016

Applicant Details

Name: CocoNutz Australia Pty Ltd(c/o Canberra Town Planning)

Postal Address: C/- Wolter Consulting
Level 2, 1 Breakfast Creek Road
Newstead QLD 4006

Email: mdargusch@wolterconsulting.com.au

Property Details

Street Address: 1 Kidd Street Mossman

Real Property Description: Lot 27 on PTA on RP804231

Local Government Area: Douglas Shire Council

Details of Proposed Development

Development Permit for Material Change of Use for a Research & Technology Industry (Pilot plant).

Decision

Date of Decision: 8 October 2021

Decision Details: Approved (subject to conditions)

Approved Drawing(s) and/or Document(s)

Copies of the following plans, specifications and/or drawings are enclosed.

The term 'approved drawing(s) and/or document(s) or other similar expressions means:

Drawing or Document	Reference	Date
Site Plans	Gregory G Terzi Building Design & Drafting, Job 0636, Drawings DA 01 Issue E and DA 02 Issue C (Council document 1005235).	December 2020

Drawing or Document	Reference	Date
Proposed Site Detail Plan	Gregory G Terzi Building Design & Drafting, Job 0636, Drawings DA 03 Issue D (Council document 1005235).	December 2020
Truck Manoeuvring	Gregory G Terzi Building Design & Drafting, Job 0636, Drawings DA 04 Issue C (Council document 1005235).	December 2020
Passenger Vehicle Manoeuvring	Gregory G Terzi Building Design & Drafting, Job 0636, Drawings DA 05 Issue C (Council document 1005235).	December 2020
Proposed Processing Plant in Main Building	Gregory G Terzi Building Design & Drafting, Job 0636, Drawings DA 06 Issue A (Council document 1005235).	December 2020
New Shed Elevations Plan	Plan prepared by Applicant, Sheet 1/1, Revision B (Council document 1005235)	25 January 2021
Hydraulic Services Part Site Plan 1 of 2 and 2 of 2	Gilboy Hydraulic Solutions, Job 204123/HS101/P2, Plans 1nd 2 of 2, Issue P2 (Council document 1005235).	22 March 2021
Environmental Management Plan – R&D Facility	Wolter Consulting Group, Revision 1 (Council document 1006444)	7 April 2021
Environmental Noise Assessment	Acoustics RB Pty Ltd, Report No. 21-1249.R01, Proposed Research and Technology Industry Facility, Final version (Council document 1006445)	6 April 2021
CTP Mossman Sugar Mill Air Quality Assessment	Vipac Engineers and Scientists Limited, Report 70B-20-0338-TRP-47306597-1 (Council document 1005235).	30 March 2021
Storm Water Quality Management Plan	Report and plans prepared by Premise Pty Ltd for Coconutz Australia Pty Ltd, Report No: CAN-0001/R01, Revision 1 (Council document 1010959).	30 April 2021

Assessment Manager Conditions & Advices

Conditions

1. Carry out the approved development generally in accordance with the approved drawing(s) and/or document(s), and in accordance with:
 - a. The specifications, facts and circumstances as set out in the application submitted to Council; and
 - b. The following conditions of approval and the requirements of Council's Planning Scheme and the FNQROC Development Manual.

Except where modified by these conditions of approval

Timing of Effect

2. The conditions of the Development Permit must be effected prior to Commencement of Use, except where specified otherwise in these conditions of approval.

Amendment to Design

3. The proposed development must:
 - a. Provide a 1.8m high acoustic barrier constructed of materials with a minimum surface area density of 10kg/m² at the southern boundary of the lease area, for a length of 50m measured from the western property boundary.
 - b. Ensure the manoeuvring, mulch collection area and bulk storage areas are sealed and drained to a lawful point of discharge. the manoeuvring, mulch collection area and bulk storage areas are to be sealed and drained to a lawful point of discharge.

The above works must be provided prior to the commencement of use.

Car Parking Area

4. The car parking associated with the premises must be provided by the provision of nine (9) car parking spaces as detailed on the approved plans. All parking, driveway and vehicular manoeuvring areas must be imperviously sealed, drained and line marked and maintained at all times.

Vehicle access to the Site

5. When travelling between the property and south of Mossman heavy vehicle access associated with the development is to utilise Williams Street.

Leachate management

6. Prior to the commencement of use the applicant must provide a leachate management plan that considers all stockpiles of billets and waste to the satisfaction of the Chief Executive Officer. The leachate management plan must include considerations of impact of storm water management.

Waste Management

7. All solid waste must be collected at regular intervals and suitably disposed of through an onsite management plan to the satisfaction of the Chief Executive Officer.

Refuse Storage

8. All refuse bins are to be stored within the building to prevent leachate. Bins are only to be washed in an area that is covered, bunded and drained to sewer.

Water Supply Internal

9. Where necessary, for the extent of the lease area over which the use is undertaken, undertake water supply works to:
- Ensure the appropriate minimum water pressure and flows (including fire-fighting flow) requirements can be provided to the site in accordance with FNQROC and the appropriate building classification for the use. Identify any extensions or upgrades proposed including on-site storage if required to achieve compliance for the classification of building and the use. Certification from an appropriately qualified hydraulic designer is required to confirm compliance.

The above works must be designed and constructed in accordance with the FNQROC Development Manual.

All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer prior to the prior to the Commencement of Use.

Liquid Waste Disposal

10. Conditions 10.a-c. regarding waste discharge excludes onsite facilities toilet, kitchen etc. which can be discharged to the local sewer catchment subject to plumbing approval.

- At full production activity a trade waste agreement for the pilot plant must be entered into with Council whereby:
 - Trade waste discharge to sewer must be in accordance with Council's Trade Waste Environmental Management Plan (TWEMP).
 - A report and hydraulic drawings demonstrating that the facility complies with the TWEMP must be submitted to the satisfaction of the Chief Executive Officer;

The trade waste agreement must be achieved prior to the commencement of full production activity.

All works identified as being required for the provision of service and upgrade of plant must be provided prior to the commencement of direct discharge of trade waste to Council's sewer to the satisfaction of the Chief Executive Officer.

- Prior to lodgement of an application for a trade waste agreement with Council:
 - Trade waste generated by the facility is to be analysed by a NATA laboratory to determine the characteristics (BOD COD TKN TP & pH). Samples are to be submitted for analysis within 1 month prior to lodging for a trade waste agreement.
 - The applicant must provide details, by a suitably qualified Process Engineer to determine the impact on Council's treatment process to the satisfaction of the Chief Executive Officer.

All costs associated with the reporting, the provision of the service and any upgrade of plant, associated with the impact of the approved development will be borne by the applicant.

- Where the use is to commence without a trade waste agreement for the direct discharge of trade waste from the site to Council's sewer, the applicant must enter into an agreement with Council whereby:
 - The trade waste must be suitable stored in suitable holding tanks.
 - The trade waste must be processed through the leachate pre-treatment plant prior to transport off the land.

- iii. All trade waste is transported off the land and discharged to the Port Douglas Waste Water Treatment Plant (or an alternative treatment plant as nominated by Council) from onsite holding tanks via a dedicated flow meter;

Details of the location and capacity of onsite holding tanks is to be provided to the satisfaction of the Chief Executive Officer prior to the commencement of use.

All works required by Council in association with the onsite storage, the off-site transport and discharge to Council's waste water facility must be provided by the applicant to the satisfaction of Council prior to Commencement of Use

The agreement for off-site discharge must be maintained until a trade waste agreement is achieved for the direct discharge of trade waste to Council's sewer.

Damage to Council Infrastructure

11. In the event that any part of Council's existing sewer, water or road infrastructure is damaged as a result of construction activities occurring on the site, including but not limited to the mobilisation of heavy construction equipment, stripping and grubbing. The applicant/owner must notify Council immediately of the affected infrastructure and have it repaired or replaced at the developer's/owners/builders cost, prior to the Commencement of Use.

Lighting

12. All lighting installed upon the premises associated with the new building, the manoeuvring, mulch collection area and bulk storage areas and the car parking areas must be certified by Ergon Energy (or such other suitably qualified person). The vertical illumination at a distance of 1.5 metres outside the southern boundary of the lease / development area must not exceed eight (8) lux measured at any level upwards from ground level.

Lawful Point of Discharge

13. All stormwater associated with the areas of the property utilised for the approved development must be directed to a lawful point of discharge such that it does not adversely affect surrounding properties or properties downstream from the development, all to the requirements and satisfaction of the Chief Executive Officer.

Advices

1. This approval, granted under the provisions of the *Planning Act 2016*, shall lapse six (6) years from the day the approval takes effect in accordance with the provisions of Section 85 of the *Planning Act 2016*.
2. All building site managers must take all action necessary to ensure building materials and/or machinery on construction sites are secured immediately following the first potential cyclone warning and that relevant emergency telephone contacts are provided to Council officers, prior to commencement of works.
3. This approval does not negate the requirement for compliance with relevant Local Laws and statutory requirements.

Liquid Waste Disposal

4. In respect to Condition 10 Samples required for Condition 10, where a full representative sample is unable to be generated prior to the use being operational, a composite estimate for analysis purposes is to be provided.
5. A copy of the related Environmental Authority Permit is included in Attachment 3 for reference purposes.
6. For information relating to the *Planning Act 2016* log on to www.dsdmip.qld.gov.au. To access the FNQROC Development Manual, Local Laws and other applicable Policies log on to www.douglas.qld.gov.au.

Infrastructure Charges Notice

5. A charge levied for the supply of trunk infrastructure is payable to Council towards the provision of trunk infrastructure in accordance with the Infrastructure Charges Notice. The original Infrastructure Charges Notice will be provided under cover of a separate letter.

The amount in the Infrastructure Charges Notice has been calculated according to Council's Infrastructure Charges Resolution.

Please note that this Decision Notice and the Infrastructure Charges Notice are stand-alone documents. The *Planning Act 2016* confers rights to make representations and appeal in relation to a Decision Notice and an Infrastructure Charges Notice separately.

The amount in the Infrastructure Charges Notice is subject to index adjustments and may be different at the time of payment. Please contact the Development Assessment Team at council for review of the charge amount prior to payment.

The time when payment is due is contained in the Adopted Infrastructure Charges Notice.

Further Development Permits

Please be advised that the following development permits are required to be obtained before the development can be carried out:

- All Building Work

All Plumbing and Drainage Work must only be carried in compliance with the Queensland *Plumbing and Drainage Act 2018*.

Concurrence Agency Response

Concurrence Agency	Concurrence Reference	Agency	Date	Doc ID
Ergon Energy	HBD 7236741		12 April 2021	1007562
State Assessment and Referral Agency (SARA)	2104-21984 SRA		24 September 2021	1039154

Note – Concurrence Agency Response is attached. This Concurrence Agency Response maybe amended by agreement with the respective agency.

Currency Period for the Approval

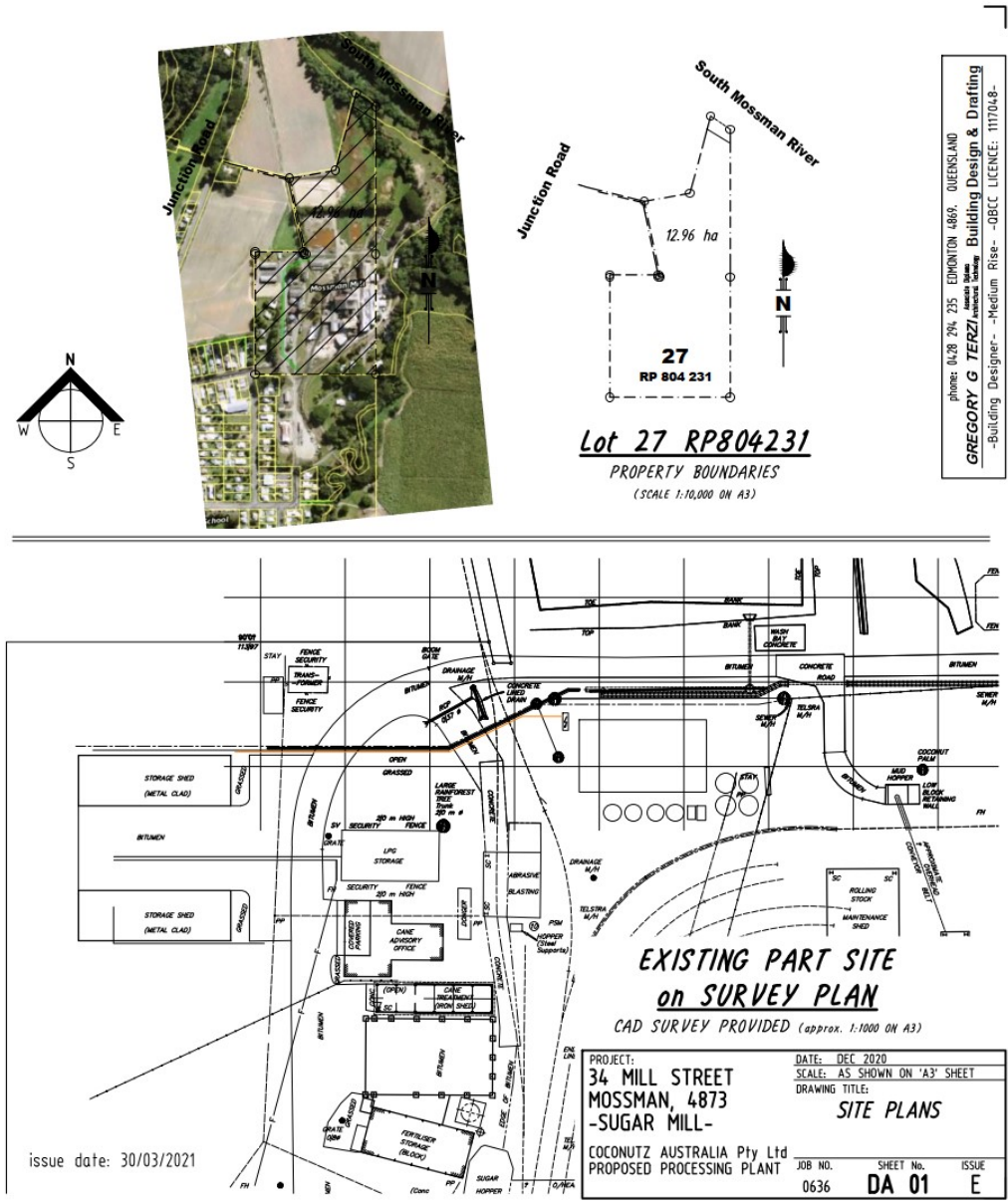
This approval, granted under the provisions of the *Planning Act 2016*, shall lapse six (6) years from the day the approval takes effect in accordance with the provisions of Section 85 of the *Planning Act 2016*.

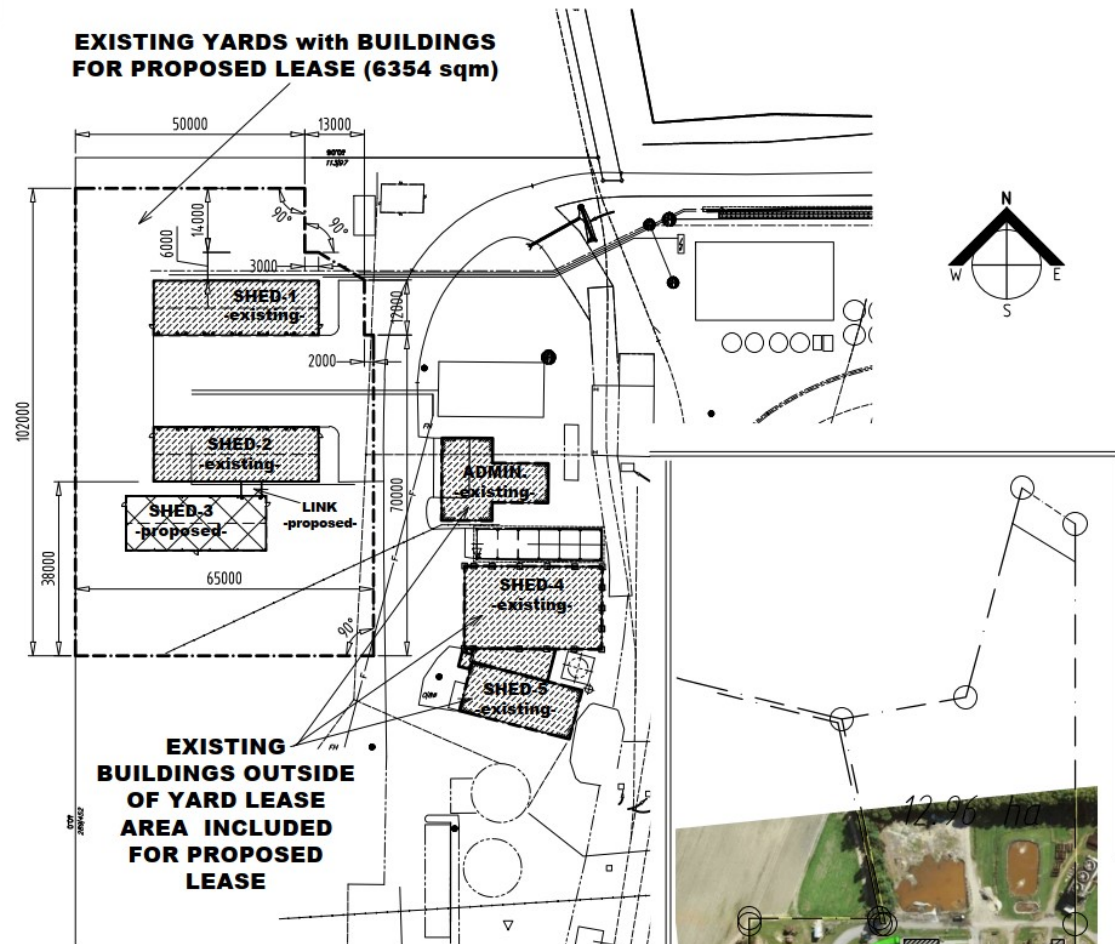
Rights to make Representations & Rights of Appeal

The rights of applicants to make representations and rights to appeal to a Tribunal or the Planning and Environment Court against decisions about a development application are set out in Chapter 6, Part 1 of the *Planning Act 2016*.

A copy of the relevant appeal provisions is attached.

Approved Drawing(s) and/or Document(s)

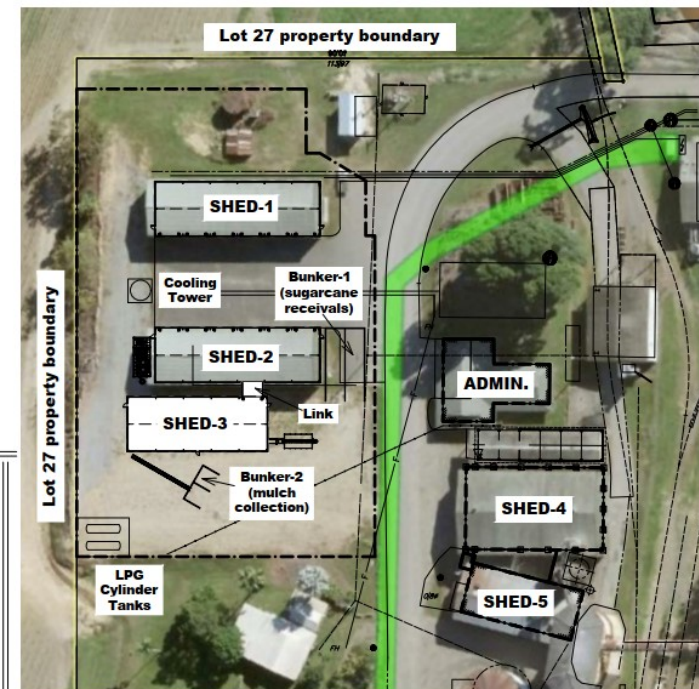
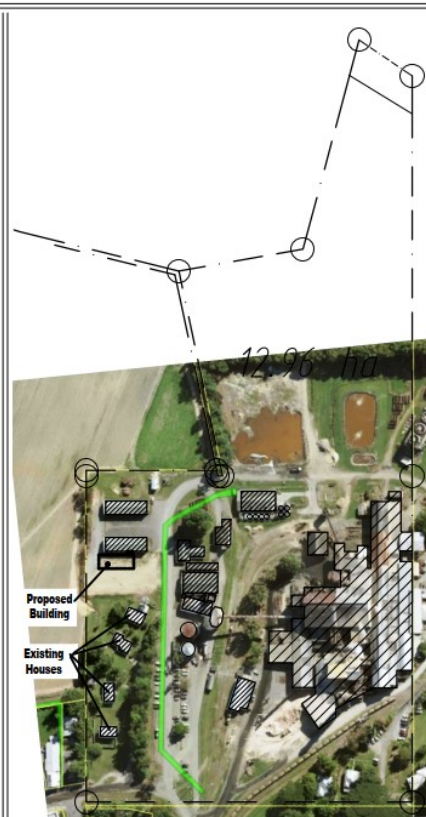




**PROPOSED LEASED AREA & BUILDINGS
on SURVEY PLAN**

CAD SURVEY PROVIDED
(approx. 1:1000 ON A3)

phone: 0428 294 235 EDMONTON 4869, QUEENSLAND
GREGORY G TERZI Associate Diploma
Architectural Technology Building Design & Drafting
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-



**PROPOSED LEASED AREA & BUILDINGS
on AERIAL VIEW / SURVEY PLAN**

CURRENT QLD GLOBE EXTRACT
(approx. 1:1000 ON A3)

**PLANNING
SCHEME INFO.**

(approx. sqm)

PROPERTY BREAK DOWN FOR SITE COVER:

TOTAL SITE AREA = 12.96 ha OR 129,600 sqm

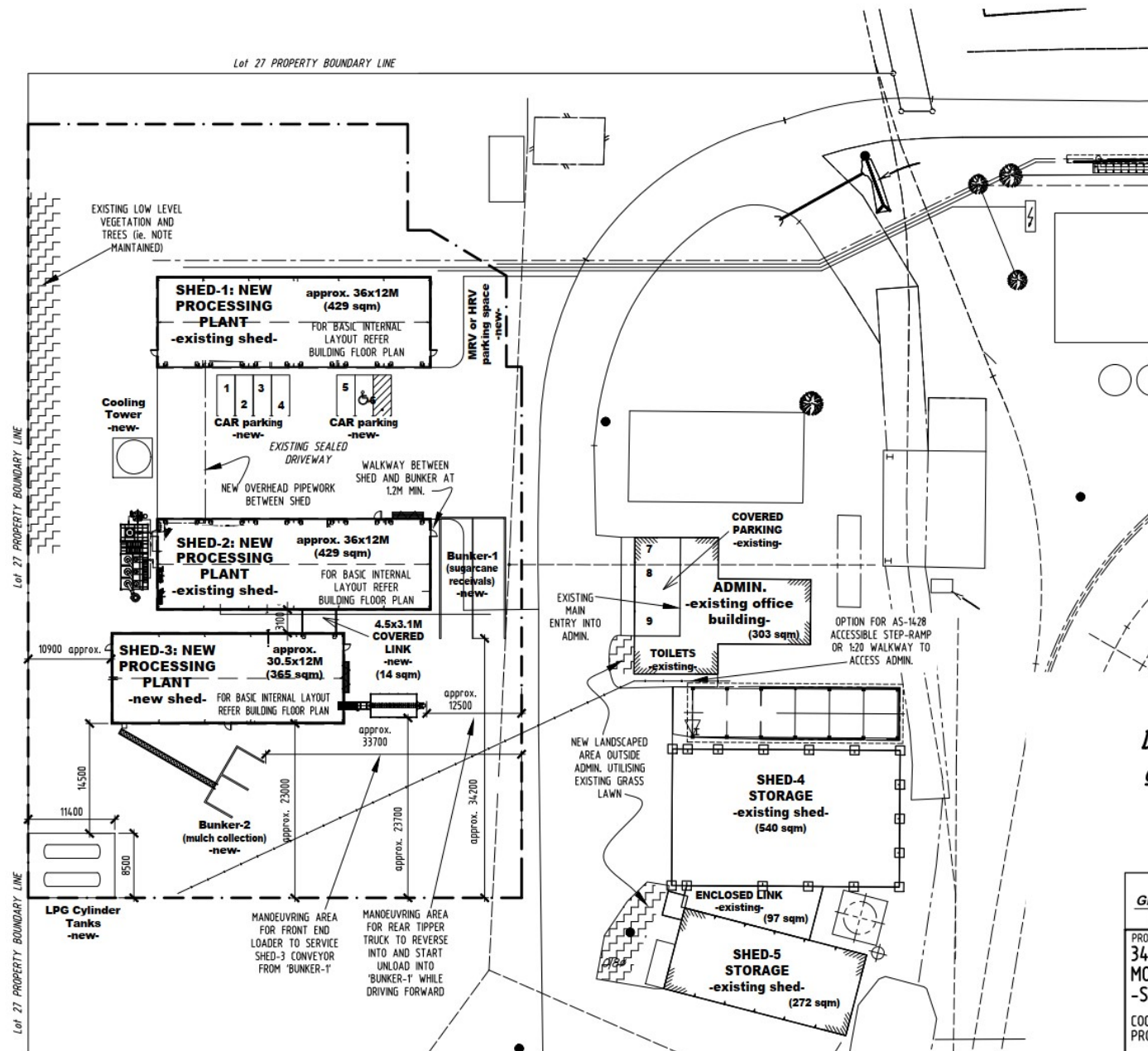
- PROPOSED BUILDINGS = approx. 0.3% of site
- EXISTING MILL AND OTHER ASSOCIATED MAIN BUILDINGS (Built-up) = approx. 13% of site
- EXISTING HOUSES = approx. 0.5% of site

REMAINING AREA = approx. 86.2% of site

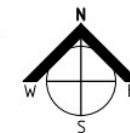
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	SITE PLANS
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. SHEET No. ISSUE
PROPOSED PROCESSING PLANT	0636 DA 02 C

issue date: 30/03/2021

issue date: 30/03/2021

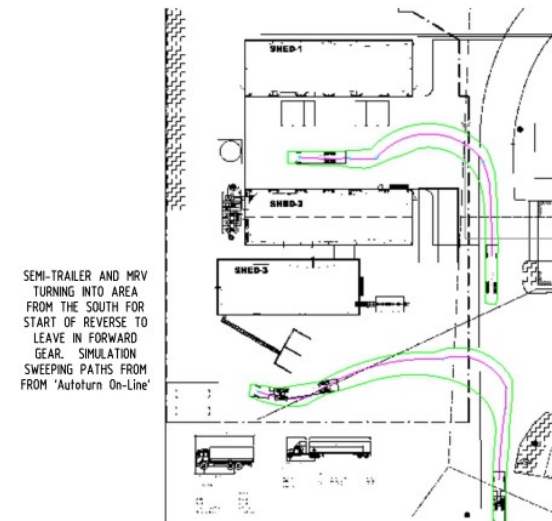
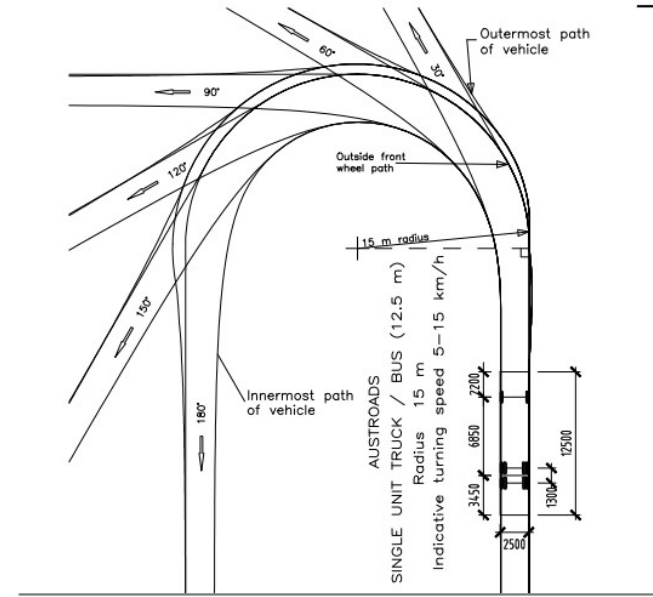
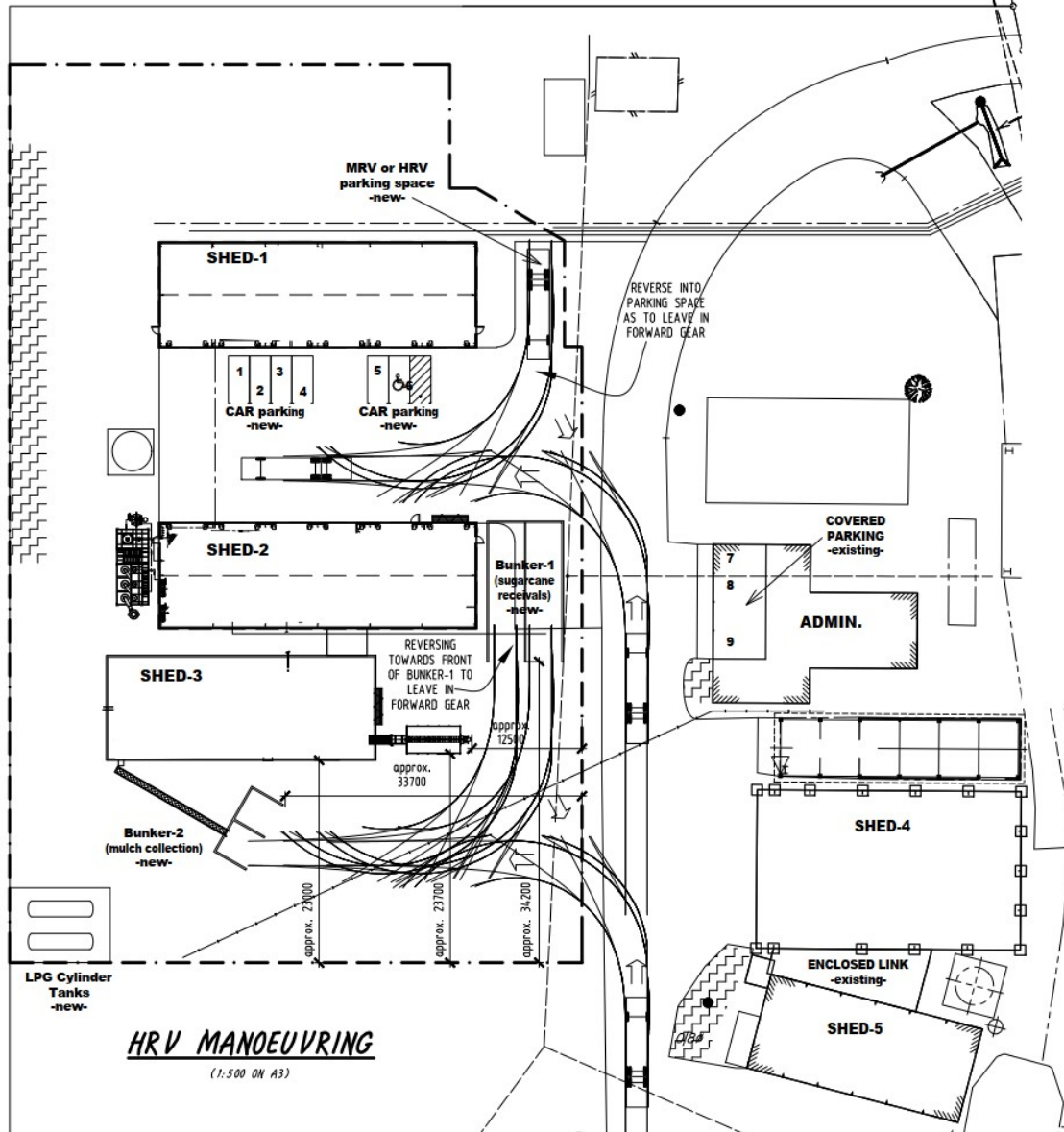


**DETAIL SITE PLAN
on SURVEY PLAN**
CAD SURVEY PROVIDED
(approx. 1:500 ON A3)

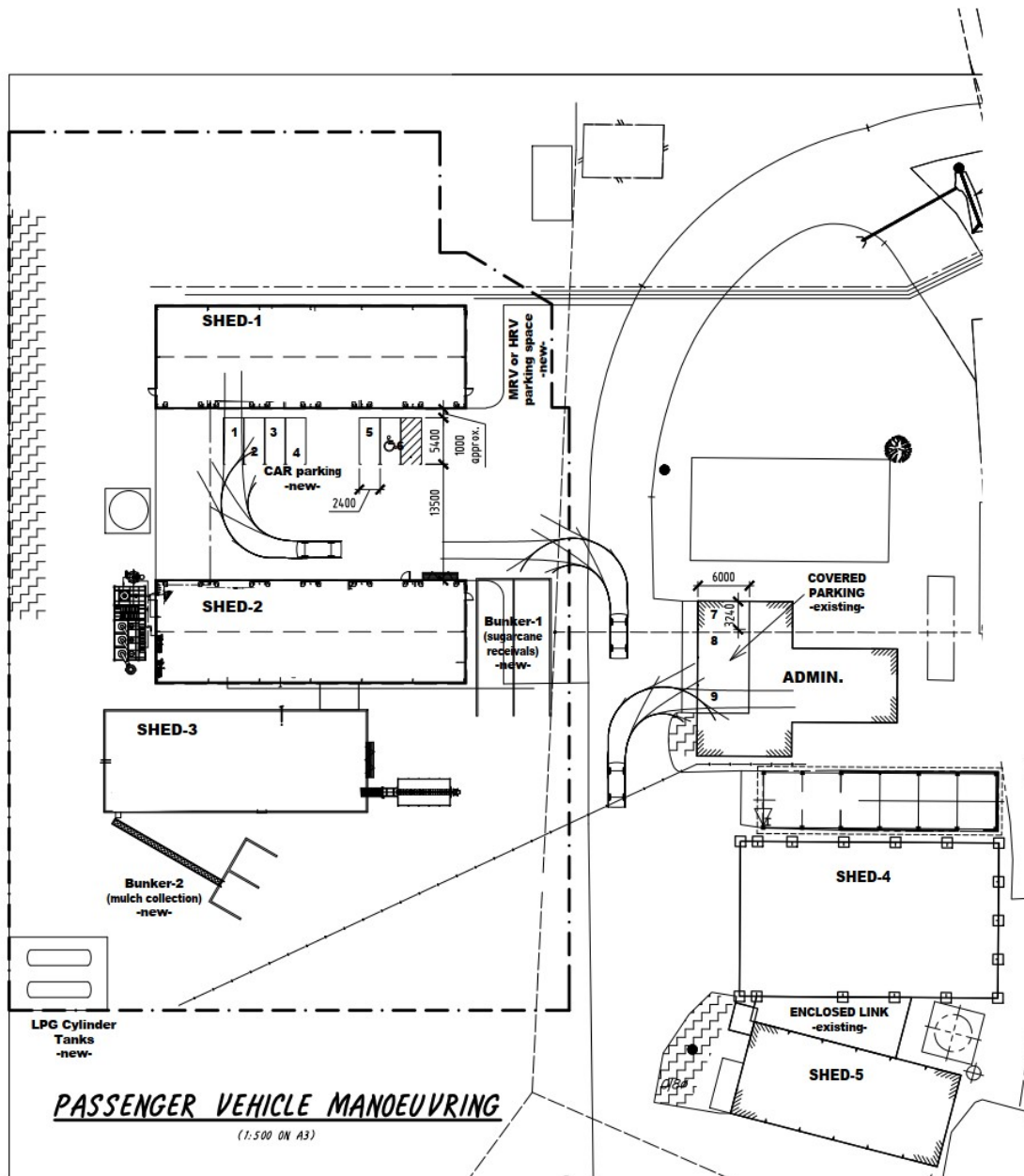


phone: 0428 294 235 EDMONTON 4869, QUEENSLAND	
GREGORY G TERZI	Associate Systems Architectural Technology
Building Design & Drafting	
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-	
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	proposed
	DETAIL SITE PLAN
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. SHEET No. ISSUE
PROPOSED PROCESSING PLANT	0636 DA 03 D

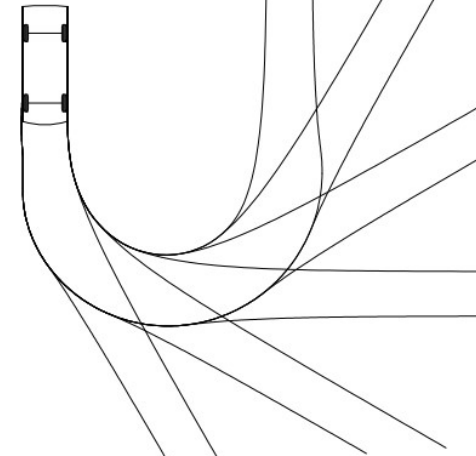
issue date: 30/03/2021



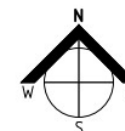
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	TRUCK MANOEUVRING
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. 0636
PROPOSED PROCESSING PLANT	SHEET No. DA 04
	ISSUE C



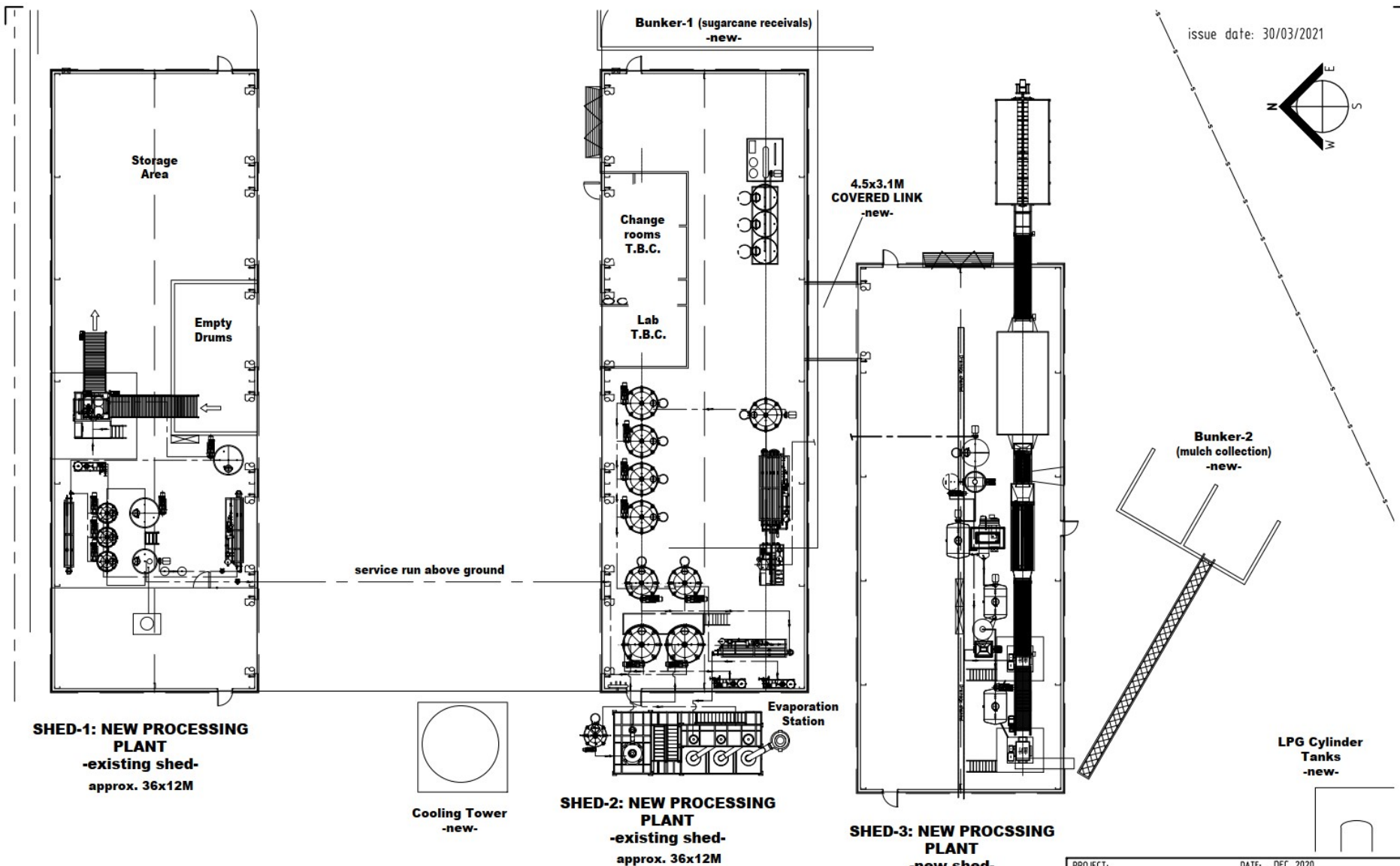
PASSENGER VEHICLE TURNING
PATH TEMPLATE FROM
AUSTRROADS 2013



issue date: 30/03/2021



phone: 0428 294 235 EDMONTON 4869. QUEENSLAND	
GREGORY G TERZI Associate Designer	Building Design & Drafting
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-	
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	PASSENGER VEHICLE MANOEUVRING
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. SHEET No. ISSUE
PROPOSED PROCESSING PLANT	0636 DA 05 C



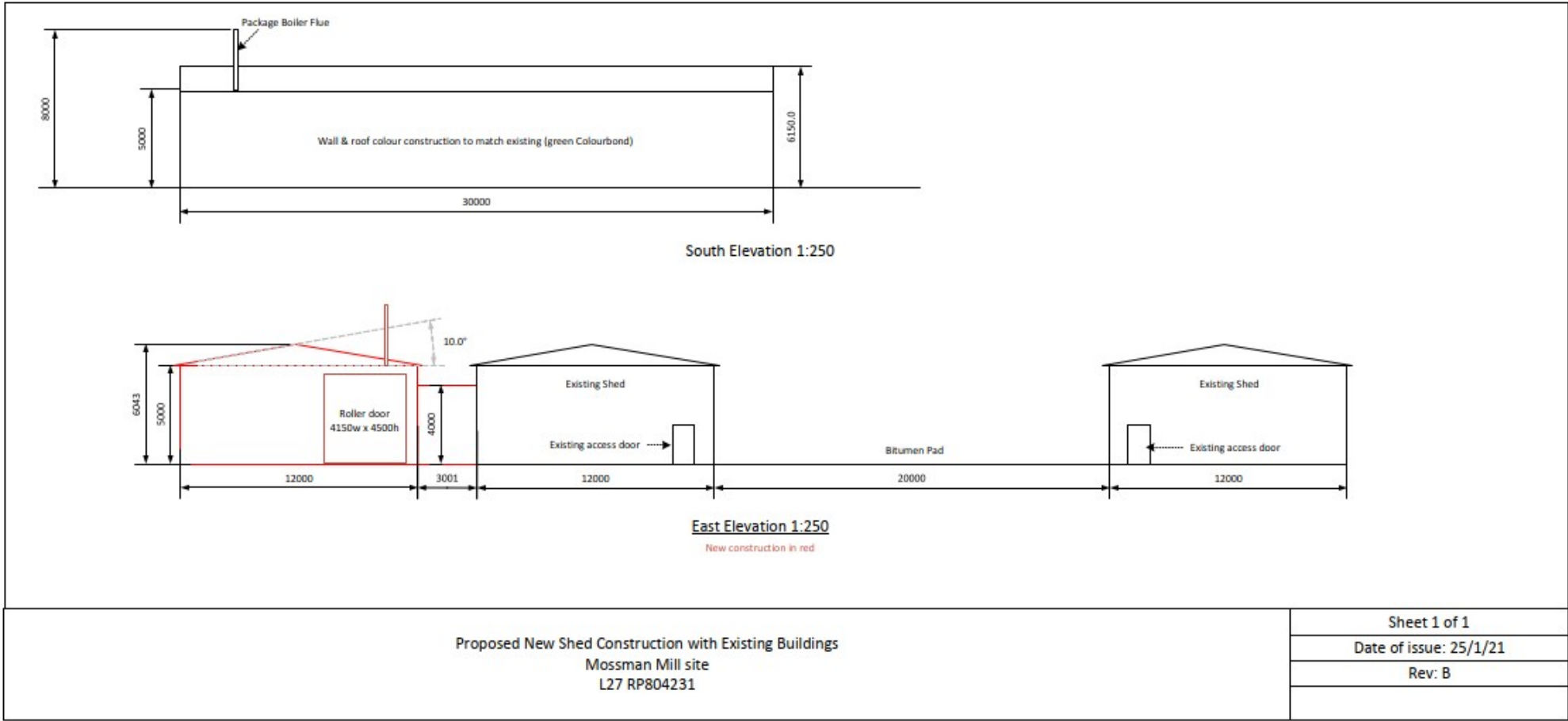
**PROPOSED
ILLUSTRATED LAYOUT WITHIN MAIN BUILDINGS**

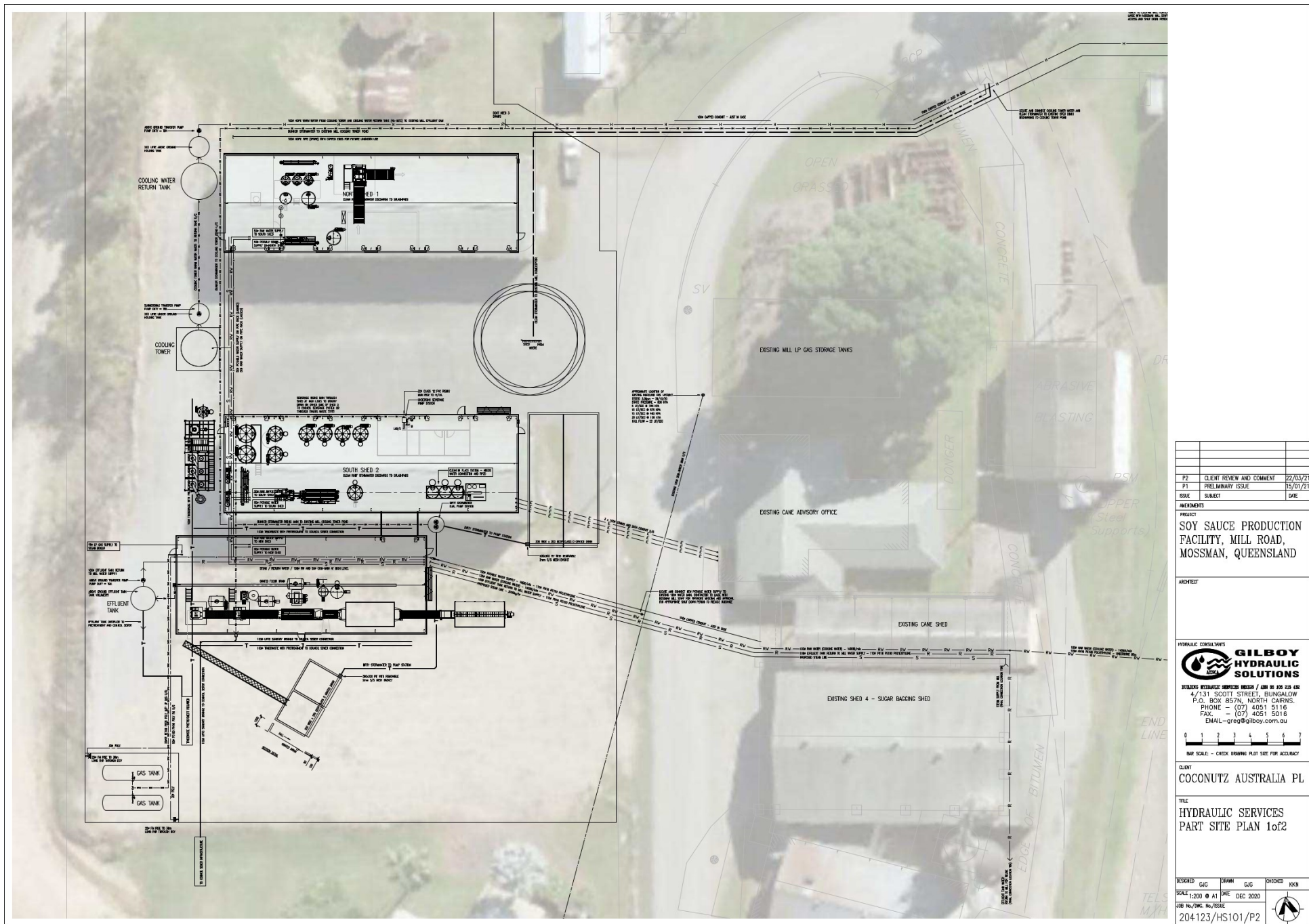
(1:200 ON A3)


phone: 0428 294 235 EDMONTON 4869. QUEENSLAND
GREGORY G TERZI Associate Systems Architectural Technology Building Design & Drafting
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-

PROJECT:	34 MILL STREET MOSSMAN, 4873 -SUGAR MILL-	DATE: DEC 2020
SCALE:	AS SHOWN ON 'A3' SHEET	
DRAWING TITLE:	proposed PROCESSING PLANT in MAIN BUILDINGS	
COCONUTZ AUSTRALIA Pty Ltd PROPOSED PROCESSING PLANT	JOB NO. 0636	SHEET No. DA 06
		ISSUE A



New Shed Elevations Plan





P2	CLIENT REVIEW AND COMMENT	22/03/21			
P1	PRELIMINARY ISSUE	15/01/21			
ISSUE	SUBJECT	DATE			
ARCHITECTS					
PROJECT					
SOY SAUCE PRODUCTION					
FACILITY, MILL ROAD,					
MOSSMAN, QUEENSLAND					
ARCHITECT					
HYDRAULIC CONSULTANTS					
 GILBOY HYDRAULIC SOLUTIONS					
SPECIALIST HYDRAULIC SERVICES MEDIA / AND IN 2018 USE					
4/131 SCOTT STREET, BUNGALOW					
P.O. BOX 857N, NORTH CAIRNS.					
PHONE - (07) 4051 5116					
FAX - (07) 4051 5018					
EMAIL - greg@gilboy.com.au					
0 1 2 3 4 5 6 7					
Mm SCALE - CHECK DRAWING PLOT SIZE FOR ACCURACY					
CLIENT					
COCONUTZ AUSTRALIA PL					
TITLE					
HYDRAULIC SERVICES					
PART SITE PLAN 1of2					
DESIGNED	GAC	DRAWN	GAC	CHECKED	KKN
SCALE	1:200	A1	DATE	DEC 2020	
JOB NO./WAC NO./RSUE					
204123/HS101/P2					



P2	CLIENT REVIEW AND COMMENT	22/03/21	
P1	PRELIMINARY ISSUE	15/01/21	
DATE	SUBJECT	DATE	
PROJECT			
SOY SAUCE PRODUCTION FACILITY, MILL ROAD, MOSSMAN, QUEENSLAND			
ARCHITECT			
HYDRAULIC CONSULTANTS			
 GILBOY HYDRAULIC SOLUTIONS 4/131 SCOTT STREET, BUNGALOW P.O. BOX 857N, NORTH CARPINS. PHONE - (07) 4051 5116 FAX - (07) 4051 5018 EMAIL - greg@gilboy.com.au			
0 1 2 3 4 5 6 7 BAR SCALE - CHECK DRAWING PLOT SIZE FOR ACCURACY			
CLIENT			
COCONUTZ AUSTRALIA PL			
TITLE			
HYDRAULIC SERVICES PART SITE PLAN 2of2			
DESIGNED	GAG	DRAWN	GAG
SCALE 1:200	A1	DATE	DEC 2020
JOB NO./W/C NO./RSK	204123/HS102/P2		
			



Vipac Engineers and Scientists Limited
Level 2, 146 Leichhardt Street, Spring Hill, QLD 4000, Australia
PO Box 47, Spring Hill, Qld, 4000 Australia
t. +61 7 3377 0400 | e. brisbane@vipac.com.au
w. www.vipac.com.au | A.B.N. 33 005 453 627 | A.C.N. 005 453 627

Canberra Town Planning PTY LTD

CTP Mossman Sugar Mill AQ Assessment

Air Quality Assessment

70B-20-0338-TRP-47306597-1

30 March 2021



Job Title: CTP Mossman Sugar Mill AQ Assessment

Report Title: Air Quality Assessment

Document Reference: 70B-20-0338-TRP-47306597-1

Prepared For:
Canberra Town Planning PTY LTD
32 Lonsdale St
Braddon
Canberra, New South Wales, 2612, Australia
Contact: Hannah Neville
Tel: 0488055642

Prepared By:
Vipac Engineers and Scientists Limited
Level 2, 146 Leichhardt Street,
Spring Hill, QLD 4000,
Australia
Tel: +61 7 3377 0400

Author: Stephen Thomas
30 March 2021
Principal Air Quality Consultant

Reviewer: Jackson Yu
30 March 2021
Team Leader B.I.E.

Issued By: Stephen Thomas
30 March 2021
Principal Air Quality Consultant

Revision History:

Rev. #	Comments / Details of change(s) made	Date	Revised by:
Rev. 00	Original Issue	30 Mar 21	

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For the purposes of preparing this report, reliance has been placed upon the material, representations, information and instructions provided to Vipac unless otherwise stated in the report. Originals of documents provided have not been required and no audit or examination of the validity of the documentation, representations, information or instructions provided has been undertaken except to the extent otherwise stated in this report. Information and findings contained in this report are based on Vipac's interpretation of data collected.

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Executive Summary

CocoNutZ Australia Pty Ltd is planning to construct an R&D (Demonstration) facility for kecap manis production adjacent to an existing plant site at 34 Mill St, Mossman. Vipac Engineers & Scientists (Vipac) have been engaged to provide an air quality assessment for the proposed facility.

An air quality impact assessment has been carried out for the assessment of the proposed kecap manis production facility emissions on the surround environment as follows:

- An emissions inventory of the primary air pollutants (PM_{2.5}, PM₁₀, NO₂, SO₂, CO and Ethanol) emitted by the demonstration facility was prepared for the maximum operating scenario based on manufacturer supplied source data and fugitive emissions estimated in accordance with the relevant National Pollutant Inventory Emissions Estimation Technique Manual.
- The emissions data was used as input for air dispersion modelling. The modelling techniques were based on a combination of The Air Pollution Model (TAPM) prognostic meteorological model (developed by CSIRO), and the CALMET model suite used to generate a three dimensional meteorological dataset for use in the CALPUFF dispersion model.
- The atmospheric dispersion modelling results were assessed by comparison with the assessment criteria described in Queensland Environment Protection (Air) Policy 2019.

The results of the modelling assessment may be summarised as follows:

- The predicted concentrations of all of the gases (CO, NO₂, SO₂ and Ethanol) and particulates (PM₁₀ and PM_{2.5}) are below the criteria at all of the modelled sensitive receptors. In addition, predicted concentrations are well below odour criteria as specified for Ethanol.
- With the exception of NO₂, the contribution of the proposed Demonstration Facility to the air quality levels predicted at the sensitive receptors is much lower than the neighbouring sugar mill.

Overall, the modelling results indicate that the operation of the proposed kecap manis production facility will not adversely impact the amenity of local residential receptors.

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1 INTRODUCTION

CocoNutZ Australia Pty Ltd is planning to construct an R&D (Demonstration) facility (the facility) for kecap manis production adjacent to an existing plant site at 34 Mill St, Mossman. It was recorded at the pre-lodgement meeting with Douglas Shire Council (Council), the proposed activity will include a material change of use to the following environmentally relevant activity (ERA):

- ERA 28 Sugar milling or refining:
Crushing or grinding 200t or more of sugar cane in a year or manufacturing 200t or more of sugar or other sugarcane products in a year (aggregate environmental score 48).

Council has therefore advised that any future application should be accompanied by an environmental impact assessment including modelling for odour and air quality. In particular, the application will need to demonstrate through air dispersion modelling that any release of point source air emissions will not result in exceedances of the air quality objectives in the Environmental Protection (Air) Policy. Emissions from the Mossman Mill will also need to be included into the modelling. Furthermore, the application will need to demonstrate how any potential odours from the proposed activity (such as through fermentation) will be managed to ensure there is no impact on the environmental values of sensitive receptors.

Vipac Engineers & Scientists (Vipac) have been engaged to provide an air quality assessment for the proposed facility.

2 PROJECT DESCRIPTION

2.1 PROCESS OVERVIEW

The process uses sugar cane as the raw material. The cane feedstock is cleaned to remove excess leaf matter and dirt. Juice is extracted by milling and dirt is separated from the juice. The leaf matter is collected and returned to the growers' fields. The dirt is added to the site's mill mud pile to be used as a natural fertiliser for cane growers.

The clean cane juice is pasteurised and then fermented to produce the Kecap Manis flavour which is a combination of natural flavours from cane juice altered by the fermentation process. After a sterilisation step, the juice is evaporated into a syrup. The syrup has additional dry ingredients added for flavour. The final product is then cooked, cooled and packed in a sterile environment.

Sugar cane is traditionally harvested from June to November. The Demonstration Facility requires plans to process 10,700 tonnes of cane to produce 3,000 tonnes of Kecap Manis product annually, packed in 220 litre drums.

2.1.1 CANE SUPPLY, CANE CLEANING AND JUICE EXTRACTION

The existing rail network on the mill grounds isn't accessible from the CocoNutZ R&D facility. Instead, green harvested sugar cane will be transported from cane sidings to site by road using a multi-lift, and deposited on a concrete pad at the Eastern side of the facility.

Production rate of the Demonstration Facility is based on a throughput of 3 tonnes per hour of cane billets. This is equivalent to 72 tonnes per day of cane billets, approximately 3 loads on a multi-lift. Based on 70% efficiency and 150 operating days per season, the annual billet consumption is 10,700 tonnes per year.

Billet storage of 12 hours is required for overnight operations which is equivalent to a cane storage requirement of around 100 cubic metres.

Extraneous matter delivered with the cane billets will be removed in two stages of cane cleaning. The material removed will be added to Far Northern Milling's (FNM) biomass stockpile.

Tramp iron will be removed using an electromagnet on a cane conveyor.

Juice will be extracted from the cane using a twin tandem of mills. Exhausted cane fibre will be added to FNM's biomass stockpile.

The cane juice will be filtered, decanted and centrifuged to remove suspended solids. The solids will be added to FNM's mill mud stockpile.

2.1.2 FERMENTATION AND PASTEURISATION

Clean juice is pasteurised to prevent natural microbes in cane juice from impacting the fermentation process.

Four fermenters are used for the biocatalytic transformation of the cane juice. The temperature is controlled using a chiller unit.

To ensure no microbes remain in the juice, a "kill-step" heats the juice up to a temperature high enough to sterilise the juice.

2.1.3 EVAPORATION

The hot juice is thickened into a syrup using 4 evaporation stages. An initial 3-body evaporation uses the vapour generated at each stage to heat the following stage, and evaporates 90% of the required water. A final stirred evaporation stage provides the fine control to get the product to the required water content.

A condenser is used to extract the final vapour from the evaporators, and the energy from this is removed in the cooling tower.

Evaporated syrup has a high sugar content and low water activity, giving it a long shelf life and can be packed and used at a later stage for final processing into Kecap Manis.

The syrup is stored in a heated buffer tank where it will be processed further during day working hours.

2.1.4 COOKING AND PACKAGING

Dry ingredients are added to the syrup to create the desired flavour profile. It is then cooked at boiling point to finalise the flavour in stirred, heated vessels.

The product then passes through a cooler and is aseptically packed into bags, and stored in plastic drums on pallets.

The product will be loaded onto semis and shipped to The Philippines and Indonesia.

2.2 POTENTIAL AIR EMISSIONS

Primary air emissions associated with the process therefore include the following:

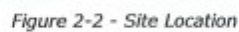
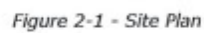
- Products of combustion generated by boilers used to heat and cook the cane juice including CO, NO₂, SO₂, VOCs, PM₁₀ and PM_{2.5}.
- Particulate matter emissions from the product handling activities (i.e. bagasse carting and crushing) within the sheds which are exhausted to the atmosphere via vents.
- Volatile organic compounds and odour primarily generated by the fermentation processes. However, it is noted that these processes are confined to the enclosed shed such that fugitive emissions would be expected to be minimal.

2.3 SITE LOCATION

The proposed site is on Lot 27 on the grounds of the Mossman Mill, on land owned by Daintree Bio-Precinct, approximately 80km North of Cairns. Figure 2-1 shows an aerial view of the facilities, a third shed is planned below the two existing sheds (left), and the site office and lab will be based in a disused building (right).

The Project Site is on the northeast border of the town of Mossman. As a result, the area to the immediate southwest is primarily commercial and residential. The surrounding area in the other directions is primarily rural, with farming and rainforests. The region is bordered to the west (~3km) by rugged steep mountain ranges and to the east (~3km) by coastal geography. In addition, 800m to the east, the terrain rises to approximately 200m.

Figure 2-1 shows the proposed site plan and Figure 2-2 shows the site location.



3 AMBIENT AIR QUALITY CRITERIA

The Environment Protection (Air) Policy 2019 (EPP (Air)) came into effect on 1 September 2019. The purpose of the policy is to achieve the object of the EP Act in relation to the air environment by: identifying environmental values to be enhanced or protected stating indicators and air quality objectives for enhancing or protecting the environmental values.

The EPP (Air) specifies air quality objectives for a range of pollutants over prescribed averaging times to be achieved and maintained by the policy. The air quality objectives appropriate for the assessment of the impacts from potential pollutants generated by the project activities are outlined in Table 3-1. In the absence of an objective for Ethanol, the Victorian State Environment Protection Policy (Air Quality Management) is adopted. Further details relating to the emissions are provided in Section 5.2.

Table 3-1: Air Quality Objectives

Pollutant	Averaging Time	Maximum Concentration ($\mu\text{g}/\text{m}^3$)
PM ₁₀	24 hours	50
	annual	25
PM _{2.5}	24 hours	25
	annual	8
Nitrogen Dioxide	1 hour	250
	annual	62
Sulphur Dioxide	1 hour	570
	24 hours	229
	annual	57
Carbon Monoxide	8 hours	11,000
Ethanol	3 minutes ¹	3,800
	3 minutes	62,700

1. Odour based criteria

4 EXISTING ENVIRONMENT

4.1 DISPERSION METEOROLOGY

4.1.1 REGIONAL METEOROLOGY

Data recorded by the nearest mainland Bureau of Meteorology (BoM) long term weather station at Cairns Airport (located approximately 62km south of the proposed Project site) was reviewed to describe the meteorological and climatic influences in the region. Long term weather data obtained from the BOM weather station at Cairns Airport is presented in Table 4-1.

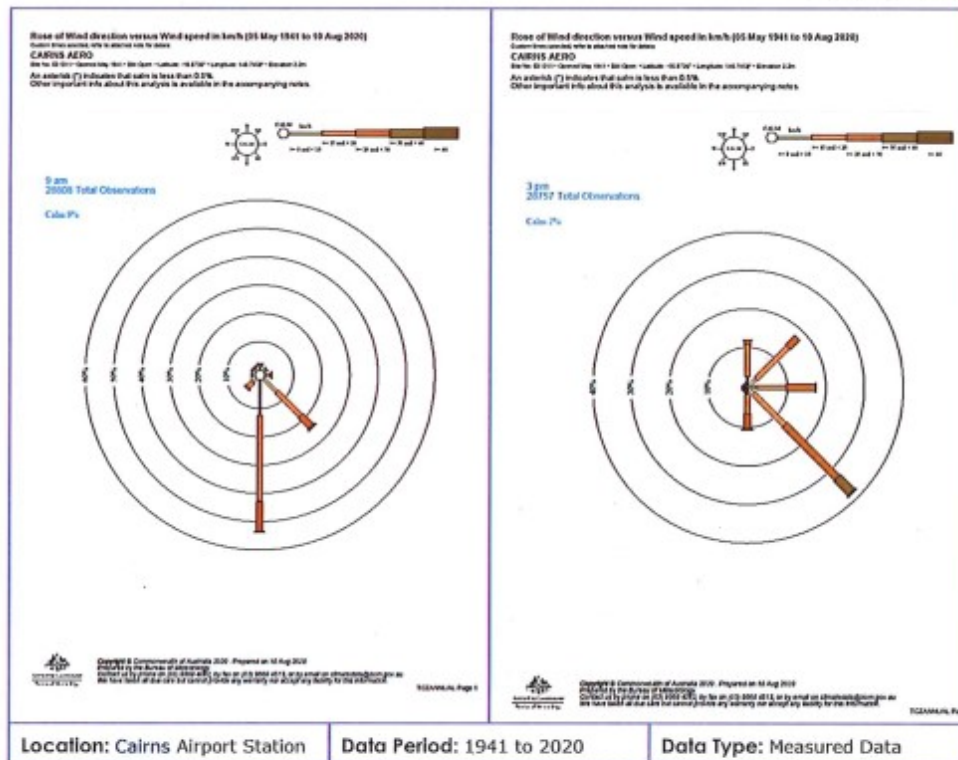
The mean temperature range is between 17.1°C and 31.5°C. The rainfall in the region is variable, with most rainfall in the summer and autumn months. On average, most of the annual rainfall is received between December and April. Rainfall is lowest between May and November. The mean annual rainfall is 1,992mm.

The long term wind roses recorded daily at the BoM station at 9am and 3pm are provided in Figure 4-1. Winds are shown to be primarily from the south at 9am and west and southeast directions at 3pm. Stronger winds (>40km/hr or >11.1m/s) occur infrequently mostly from the southeast direction at 3pm.

The region experiences hot and humid summers and mild, dry winters.

Table 4-1: Mean Long-term Weather Data for Cairns Airport (1941 to 2021)

Month	Mean Temperature		Rainfall (mm)	9 am Conditions			3 pm Conditions		
	Max (°C)	Min (°C)		Temp (°C)	RH (%)	Wind Speed (km/h)	Temp (°C)	Mean RH (%)	Wind Speed (km/h)
Jan	31.5	23.7	402.7	27.6	75	8.8	29.9	66	15.6
Feb	31.3	23.8	441.8	27.2	78	8.9	29.6	69	14.6
Mar	30.6	23.1	417.6	26.5	78	12.2	29.2	67	17.3
Apr	29.3	21.7	191.2	25.1	78	14.5	27.9	65	19
May	27.7	19.9	91.5	23.3	76	14.7	26.4	64	17.9
Jun	26.1	18	47	21.3	74	15.9	24.9	61	18.1
Jul	25.8	17.1	30.7	20.6	72	15.7	24.6	58	18.7
Aug	26.7	17.4	25.9	21.6	70	14.8	25.3	56	19.6
Sep	28.2	18.7	33.5	23.7	66	13.9	26.7	55	20.5
Oct	29.6	20.6	47.5	25.9	65	11.3	28.1	57	19.1
Nov	30.7	22.3	90.3	27.3	68	10	29.2	60	18
Dec	31.5	23.4	182.9	28	70	9.2	29.9	62	17
Annual	29.1	20.8	1991.5	24.8	72	12.5	27.6	62	18



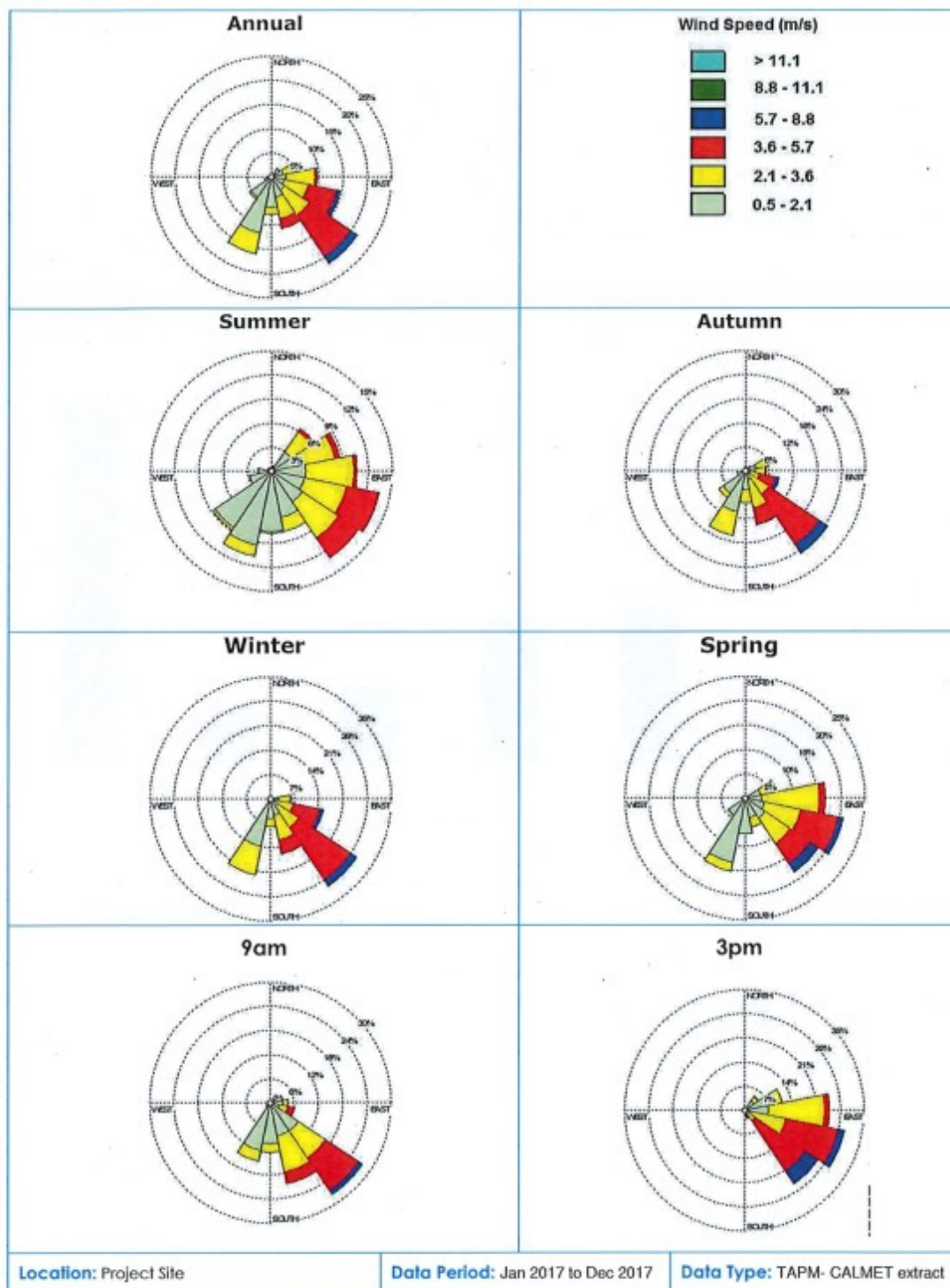


Figure 4-2: Wind Roses for the TAPM-CALMET Derived Dataset at the Project site, 2017

4.1.2.2 ATMOSPHERIC STABILITY

The Pasquill-Gifford stability classification scheme denotes stability classes from A to F. Class A is described as highly unstable and occurs in association with strong surface heating and light winds, leading to intense convective turbulence and much enhanced plume dilution. At the other extreme, class F denotes very stable conditions associated with strong temperature inversions and light winds, which commonly occur under clear skies at night and in the early morning. Intermediate stability classes grade from moderately unstable (B), through neutral (D) to slightly stable (E). Whilst classes A and F are strongly associated with clear skies, class D is linked to windy and/or cloudy weather, and short periods around sunset and sunrise when surface heating or cooling is small. Figure 4-3 shows the stability class percentages from the TAPM-CALMET derived meteorological data for the project site. The data identifies that Stability Class F is most common; this stability class is indicative of stable atmospheric conditions.

As a general rule, unstable (or convective) conditions dominate during the daytime and stable flows are dominant at night. This diurnal pattern is most pronounced when there is relatively little cloud cover and light to moderate winds.

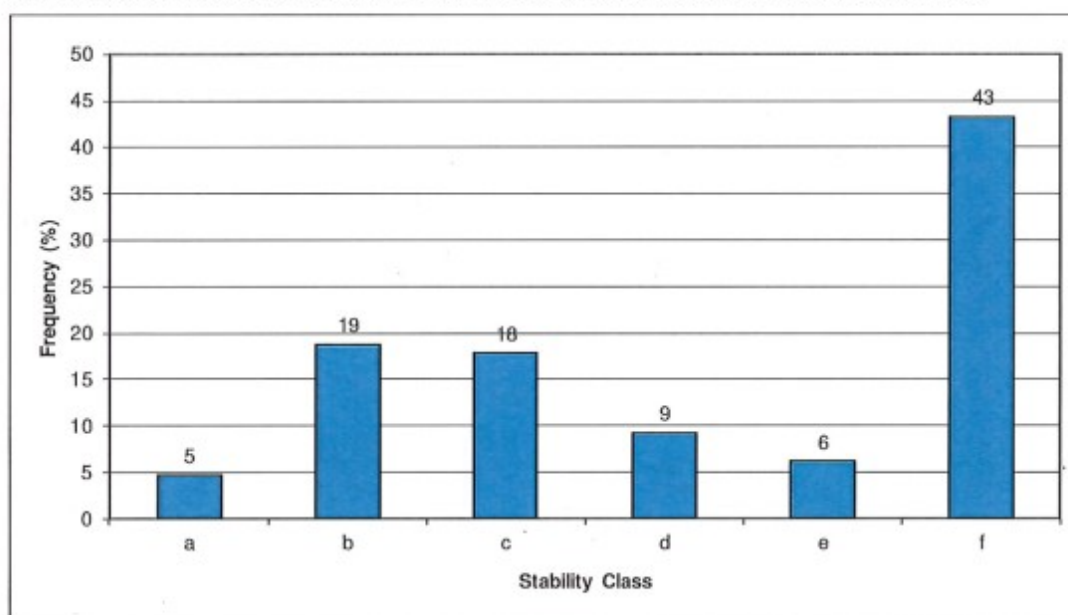


Figure 4-3: Stability Class Percentages for the TAPM-CALMET Derived Data, 2017

4.1.2.3 MIXING HEIGHT

Mixing height is defined as the height of the layer adjacent to the ground over which an emitted or entrained inert non-buoyant tracer will be mixed (by turbulence) within a time scale of about one hour or less.

Diurnal variations in mixing depths are illustrated in Figure 4-4. As would be expected, an increase in the mixing depth during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and the growth of the convective mixing layer.

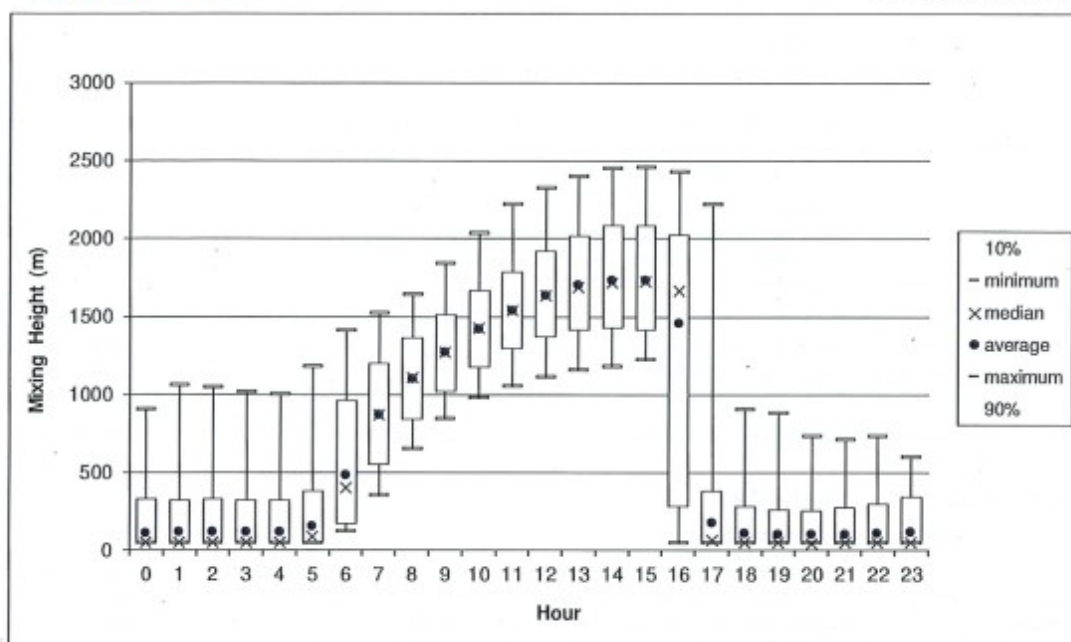


Figure 4-4: Mixing Height of the TAPM-CALMET Derived Data, 2017

4.2 EXISTING AIR QUALITY

The primary sources of air emissions in the region immediately surrounding the Project site are from the adjacent sugar mill activities and wind-blown dust primarily including PM_{10} and $PM_{2.5}$.

Given the remoteness of the location, background levels of pollutants at the Project site are expected to be low except for those affected by the Sugar Mill operations and consequentially, there are no nearby Queensland Department of Environment and Science (DES) air quality monitoring stations currently operating.

In the absence of measured ambient air quality data, background emissions for the Sugar Mill sources were estimated based on the National Pollutant Inventory (NPI) report for the 2018/2019 reporting year (the most recent available data at the time of modelling). Details of the approach are provided in Section 5.2.2.

5 METHODOLOGY

5.1 OVERVIEW

The overall approach to the assessment follows the guidelines outlined in the Generic Guidance and Optimum Model Settings for the CALPUFF modelling system in the 'Approved methods for the Modeling and Assessment of Air Pollutants in NSW' (NSW OEH, 2011). The assessment was conducted as follows:

- An emissions inventory of the primary air pollutants (PM_{2.5}, PM₁₀, NO₂, SO₂, CO and Ethanol) emitted by the demonstration facility was prepared for the maximum operating scenario based on manufacturer supplied source data and fugitive emissions estimated in accordance with the relevant National Pollutant Inventory Emissions Estimation Technique Manual.
- The emissions data was used as input for air dispersion modelling. The modelling techniques were based on a combination of The Air Pollution Model (TAPM) prognostic meteorological model (developed by CSIRO), and the CALMET model suite used to generate a three dimensional meteorological dataset for use in the CALPUFF dispersion model (Section 5.3.3).
- The atmospheric dispersion modelling results were assessed by comparison with the assessment criteria described in Section 3.

5.2 EMISSIONS INVENTORY

5.2.1 POINT SOURCE EMISSIONS

The point source emissions input data for the modelled pollutants emitted by the cane handling and processing activities was derived based upon the maximum proposed cane pressing throughput (for bagasse stockpiling and bagasse crushing in two enclosed sheds fitted with exhaust vents and emission factors specified in the National Pollutant Inventory Emissions Estimation Technique Manual for Sugar Milling and Refining for these activities. This is considered a worst-case scenario. Size classified PM emissions (i.e. PM_{2.5}) were unavailable so PM₁₀ emissions were conservatively adopted as representative of PM_{2.5}.

Ethanol emissions (for odour assessment) via the two exhaust vents have also been quantified using the emission factor specified in the National Pollutant Inventory Emissions Estimation Technique Manual for Sugar Milling and Refining. A maximum throughput of 3t/hr sugar cane billets has been used for the estimations.

The point source emissions input data for the modelled pollutants emitted by the combustion boilers was derived based upon the maximum hourly fuel consumption for the two proposed boilers and emission factors specified in the National Pollutant Inventory Emissions Estimation Technique Manual for Combustion Boilers for LPG. This is also considered a worst-case scenario.

Appendix A provides further details of the emissions estimation methodology adopted.

The physical stack modelling parameters were provided by CocoNutZ. Table 5-1 outlines the emissions data modelled.

5.2.2 BACKGROUND EMISSIONS

Point and fugitive (i.e. VOCs) source emissions for the Sugar Mill were estimated based on the National Pollutant Inventory (NPI) report for the 2018/2019 reporting year (the most recent available data at the time of modelling). Stack parameters are based upon the Sugar Mill's Environmental Authority (EPPR00920713).

Table 5-1 outlines the emissions data modelled.

Table 5-1: Modelled Stack Source Emissions Data

Source ID	UTM Coordinates (km)		Ht (m)	Diam (m)	Vel (m/s)	Temp (K)	Emission Rate (g/s)				
	X	Y					CO	NOx	PM ₁₀	PM _{2.5}	Ethanol
Demonstration Facility Sources											
Boiler1	326.745	8179.811	8	0.15	10	303	0.0321	0.1908	0.0111	0.0034	0.0002
Boiler2	326.745	8179.807	8	0.15	10	303	0.0321	0.1908	0.0111	0.0034	0.0002
Vent1	326.779	8179.801	8	1.5	11.3	298	-	-	0.00099	0.00099	0.054
Vent2	326.779	8179.845	8	1.5	5.7	298	-	-	0.00047	0.00047	0.054
Sugar Mill Sources (Background)											
Boiler	326.947	8179.659	46.4	2	15.25	303	22.47	6.54	6.46	3.74	2.15
Fugitive VOCs	326.922	8179.718	5	-	-	-	-	-	-	-	0.34 ¹

1. It is conservatively assumed that all fugitive VOC emissions reported for the sugar mill are ethanol.

5.3 MODELLING

5.3.1 TAPM

To generate the meteorological inputs to run CALPUFF, this study has used the model The Air Pollution Model (TAPM), which is a 3-dimensional prognostic model developed and verified for air pollution studies by the CSIRO. TAPM was configured as outlined in Table 5-2.

Table 5-2: TAPM Set Up Data

Parameter	Setting
Centre Coordinates	16°27.5 S; 145°22.5 E
Dates Modelled	30 December 2016 to 31 December 2017 (2 start-up days)
Grid Domains	Four nested grid domains of 30 km, 10 km, 3 km and 1 km;
Vertical Levels	25 vertical levels from 10 m to an altitude of 8000 m above sea level
Data assimilation	Bureau of Meteorology Cairns Airport Weather Station for 2017

5.3.2 CALMET

CALMET is an advanced non-steady-state diagnostic three-dimensional meteorological model with micro-meteorological modules for overwater and overland boundary layers. The model is the meteorological pre-processor for the CALPUFF modelling system.

The CALMET simulation was run as No-Obs simulation with the gridded TAPM three-dimensional wind field data from the innermost grid. CALMET then adjusts the prognostic data for the kinematic effects of terrain, slope flows, blocking effects and three-dimensional divergence minimisation.

Vipac adopted the no observation approach for this site which uses prognostic data generated using TAPM nudged with observational data for the assessment. The CALMET modelling setup is presented in Table 5-3.

Table 5-3: CALMET setup parameters

Parameter	Setting
Meteorological grid domain	20km x 20km (80 x 80 x 10 grid dimensions)
Meteorological grid resolution	0.25km
Surface meteorological stations	None
Upper air meteorological station	None
3D Wind field	3D wind fields from TAPM (1km resolution) input as an initial guess to CALMET

5.3.3 CALPUFF

CALPUFF is a non-steady-state Lagrangian Gaussian puff model. CALPUFF employs the three-dimensional meteorological fields generated from the CALMET model by simulating the effects of time and space varying meteorological conditions on pollutant transport, transformation and removal.

The emissions have been modelled in accordance with the *Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia'* using CALPUFF using the following key inputs:

- meteorological dataset for 1/1/2017 to 31/12/2017 generated in CALMET.
- 80 x 80 grid with a grid spacing 250m.
- terrain data from NASA SRTM1 - Shuttle Radar Topography Mission 1 arc second
- emission rates and source configurations as presented in Section 5.2.
- partial plume adjustment for terrain influences.
- Building wake effects for structures and building within the Project site.

- a radius of terrain feature set to 2km and minimum radius of influence to 0.1km.

5.3.4 METHOD FOR CONVERSION OF OXIDES OF NITROGEN TO NITROGEN DIOXIDE

Oxides of nitrogen (NO_x) emitted from internal combustion engines are composed primarily of nitric oxide (NO) and nitrogen dioxide (NO₂). Although NO and NO₂ are reported together as NO_x, they have different characteristics, including different formation mechanisms, measurement techniques, and toxicity (Olsen, et al., 2010). Eventually, all NO emitted is oxidized to NO₂ in the atmosphere in the presence of ozone and sunlight. The reaction takes place over several hours and can result in increased ground level NO₂ concentrations further down-plume (far field) and decreased closer to the source (near field).

The formation of NO₂ from NO is a complex photochemical process depending on a number of factors is that include the total amount of available NO_x and ozone. To simplify this reaction two different NO_x to NO₂ have been modelled.

The gridded receptors representing impacts from far field combustion sources have been modelled as a 100% conversion ratio given the distances to the site. This is considered to be a conservative estimation of the actual conversion. For the sensitive receptors close to the source (<200m), a ratio of 40% has been used. This is based on the monitoring results presented in the Clean and Healthy Air for Gladstone Final Ambient Air Quality Monitoring Plan (DERM, 2009) where between 20 - 40% of the NO_x is present as NO₂.

Given the above, a ratio of 0.4 has been used as a conservative approach for NO_x emissions associated with impacts from combustion sources at the proposed facility on local sensitive receptors.

5.4 SENSITIVE RECEPTORS

The Project site and the nearest sensitive receptors (R) are shown in Figure 5-1 and summarised in Table 5-4. It is noted that some receptors, such as R8 to R13, are representative of the closest of multiple dwellings.

Table 5-4: Sensitive Receptor Locations

Sensitive Receptor ID	UTM Coordinates		Description
	East (m)	South (m)	
R1	326764	8179748	Kid St Residence
R2	326752	8179729	Kid St Residence
R3	326735	8179693	Kid St Residence
R4	326682	8179654	Mill St Commercial
R5	326655	8179657	Mill St Commercial
R6	326615	8179670	Mill St Commercial
R7	326575	8179668	Mill St Commercial
R8	326468	8179728	Junction Rd Residence
R9	326497	8179785	Junction Rd Residence
R10	326537	8179851	Junction Rd Residence
R11	326572	8179926	Junction Rd Residence
R12	326602	8179978	Junction Rd Residence
R13	326700	8180068	Junction Rd Residence
R14	326907	8179599	Residence
R15	326938	8179606	Residence
R16	326893	8179515	Residence



Figure 5-1: Sensitive Receptor Locations

6 RESULTS AND DISCUSSION

6.1 OVERVIEW

This section presents the results of the air dispersion modelling for the maximum worst case operation inclusive of background (i.e. for assessment of cumulative impacts including the sugar mill operations). The tabulated results are presented for the model predictions at the sensitive receptors for each pollutant and compared with relevant ambient air quality criteria.

Contour plots showing the spatial distribution of model predictions inclusive of background in the surrounding environment are shown in Appendix B.

6.2 RESULTS

The model predictions in isolation and including background at the modelled sensitive receptors at the Project site for the worst-case maximum operation running for one full year are shown in Table 6-1 and Table 6-2.

It can be seen from the tables that the predicted concentrations of all of the gases (CO, NO₂, SO₂ and Ethanol) and particulates (PM₁₀ and PM_{2.5}) are below the criteria at all of the modelled sensitive receptors. In addition, predicted concentrations are well below odour criteria as specified for Ethanol.

It is also worth noting that, with the exception of NO₂, the contribution of the proposed Demonstration Facility to the air quality levels predicted at the sensitive receptors is much lower than the neighbouring sugar mill.

Table 6-1: Model Predictions - Gases

ID	In Isolation ($\mu\text{g}/\text{m}^3$)						Cumulative ($\mu\text{g}/\text{m}^3$)					
	CO		NO ₂		SO ₂		CO		NO ₂		SO ₂	
	8 Hour	1 Hour	Annual	1 Hour	24 Hour	Annual	8 Hour	1 Hour	Annual	1 Hour	24 Hour	Annual
Ave time												
R1	10.4	60.4	0.32	0.14	0.02	0.00	116.0	60.4	2.2	24.3	4.2	1.5
R2	15.1	54.9	0.30	0.13	0.03	0.00	110.2	54.9	2.2	25.3	4.2	1.6
R3	11.4	53.4	0.23	0.12	0.02	0.00	104.1	53.4	2.2	21.4	3.6	1.6
R4	4.8	28.2	0.16	0.06	0.01	0.00	97.8	33.3	1.8	27.3	3.7	1.3
R5	4.5	69.1	0.19	0.16	0.02	0.00	91.0	69.1	1.7	29.2	3.7	1.2
R6	7.5	122.0	0.29	0.28	0.02	0.00	74.6	122.0	1.6	28.6	3.4	1.1
R7	10.2	112.1	0.42	0.26	0.03	0.00	69.3	112.1	1.6	29.2	3.6	1.0
R8	8.4	76.0	1.46	0.17	0.02	0.00	64.5	76.1	2.5	44.7	2.5	0.8
R9	12.7	107.4	2.89	0.25	0.04	0.01	73.4	107.7	3.9	51.9	2.4	0.8
R10	26.0	153.3	4.27	0.35	0.05	0.01	62.2	153.3	5.2	43.7	2.1	0.8
R11	14.0	146.0	3.28	0.34	0.04	0.01	65.1	146.1	4.1	25.6	2.1	0.7
R12	18.0	146.9	2.46	0.34	0.04	0.01	60.9	146.9	3.1	33.4	1.8	0.5
R13	10.4	145.2	1.34	0.33	0.02	0.00	53.4	145.2	1.8	36.7	1.7	0.4
R14	1.5	25.5	0.07	0.06	0.00	0.00	31.4	25.5	0.1	15.9	1.2	0.0
R15	2.3	24.8	0.07	0.06	0.00	0.00	34.5	24.8	0.1	14.6	1.3	0.0
R16	2.1	20.6	0.05	0.05	0.00	0.00	55.4	24.0	0.1	19.5	2.4	0.0
Criteria	11,000	250	62	570	229	57	11,000	250	62	570	229	57
Maximum Conc	26.0	153.3	4.3	0.4	0.0	0.0	116.0	153.3	5.2	51.9	4.2	1.6
Criteria met?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 6-2: Model Predictions - Particulates

ID	In Isolation				Cumulative			
	PM ₁₀ (µg/m³)		PM _{2.5} (µg/m³)		PM ₁₀ (µg/m³)		PM _{2.5} (µg/m³)	
	24 Hour	Annual	24 Hour	Annual	24 Hour	Annual	24 Hour	Annual
R1	1.27	0.05	0.44	0.01	12.45	4.58	7.20	2.64
R2	1.80	0.04	0.59	0.01	12.49	4.80	7.23	2.77
R3	1.37	0.03	0.46	0.01	10.84	4.83	6.27	2.78
R4	0.79	0.02	0.29	0.01	11.13	4.03	6.44	2.32
R5	1.21	0.03	0.42	0.01	11.11	3.73	6.43	2.15
R6	1.65	0.04	0.55	0.01	10.34	3.37	5.96	1.94
R7	1.79	0.06	0.57	0.02	10.98	3.04	6.30	1.74
R8	1.26	0.22	0.41	0.07	8.48	2.67	4.70	1.49
R9	2.33	0.43	0.74	0.14	8.32	2.93	4.52	1.58
R10	3.18	0.63	0.99	0.20	7.01	2.98	3.79	1.56
R11	2.39	0.49	0.74	0.16	7.27	2.43	3.93	1.28
R12	2.80	0.37	0.88	0.12	6.47	2.00	3.45	1.06
R13	1.45	0.20	0.46	0.07	6.09	1.32	3.23	0.71
R14	0.19	0.01	0.08	0.00	3.81	0.11	2.20	0.06
R15	0.24	0.01	0.11	0.00	3.99	0.08	2.30	0.04
R16	0.26	0.01	0.09	0.00	7.12	0.14	4.12	0.08
Criteria	50	25	25	8	50	25	25	8
Maximum Concentration	3.2	0.6	1.0	0.2	12.5	4.8	7.2	2.8
Criteria met?	✓	✓	✓	✓	✓	✓	✓	✓

Table 6-3: Model Predictions - Ethanol

	In isolation		Cumulative	
ID	Ethanol (µg/m³)			
Averaging time	3 minutes		3 minutes	
R1	77		934	
R2	70		790	
R3	68		683	
R4	36		420	
R5	88		422	
R6	155		438	
R7	143		403	
R8	97		326	
R9	137		463	
R10	195		501	
R11	186		474	
R12	187		483	
R13	185		561	
R14	32		604	
R15	32		609	
R16	26		508	
Criteria	3,800	62,700	3,800	62,700
Maximum Concentration	187		934	
Criteria met?	✓		✓	

7 CONCLUSIONS

An air quality assessment for the R&D (Demonstration) facility for kecap manis production adjacent to an existing plant site at 34 Mill St, Mossman. The overall approach to the assessment follows the the guidelines outlined in the Generic Guidance and Optimum Model Settings for the CALPUFF modelling system in the 'Approved methods for the Modeling and Assessment of Air Pollutants in NSW'.

The results of the modelling assessment may be summarised as follows:

- The predicted concentrations of all of the gases (CO, NO₂, SO₂ and Ethanol) and particulates (PM₁₀ and PM_{2.5}) are below the criteria at all of the modelled sensitive receptors. In addition, predicted concentrations are well below odour criteria as specified for Ethanol.
- With the exception of NO₂, the contribution of the proposed Demonstration Facility to the air quality levels predicted at the sensitive receptors is much lower than the neighbouring sugar mill.

Overall, the modelling results indicate that the operation of the proposed kecap manis production facility will not adversely impact the amenity of local residential receptors.

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Appendix A EMISSIONS ESTIMATION ASSUMPTIONS

Emission factors can be used to estimate emissions of pollutants to the air from various sources. Emission factors relate the quantity of a substance emitted from a source to some measure of activity associated with the source. Common measures of activity include distance travelled, quantity of material handled, or the duration of the activity.

The National Pollutant Inventory Emission Estimation Technique Manual for Sugar Milling and Refining (January 2001) provides the equations and emission factors to determine the emissions of PM₁₀ from dust generating activities. These emission factors incorporate emission factors published by the USEPA in their AP-42 documentation.

Table A-1 and Table A-2 summarises the PM₁₀ and Ethanol emission factors adopted from the Manual for the emissions estimations. As discussed in Section 5.2, size classified PM emissions (i.e. PM_{2.5}) were unavailable so PM₁₀ emissions were conservatively adopted as representative of PM_{2.5}.

As the dust generating activities are within the enclosed sheds, the emission factors were applied to a maximum proposed throughput of 626 kg/h with dust extracted through two exhaust vents (one for each shed).

Table A-1: PM₁₀ emission factors adopted for the emissions estimations

Source	Emission Factor (kg PM ₁₀ /t cane crushed)
Bagasse Stockpile (carting)	2.72×10^{-3}
Bagasse Dust (crushing)	5.67×10^{-3}

Table A-2: Ethanol emission factors adopted for the emissions estimations

Pollutant	Emission Factor (kg/t)
Ethanol	0.065

The National Pollutant Inventory Emission Estimation Technique Manual for Combustion in Boilers (December 2011) provides the equations and emission factors to determine the emissions of combustion pollutants from boilers. These emission factors incorporate emission factors published by the USEPA in their AP-42 documentation.

Table A-2 summarises the PM₁₀ emission factors adopted from the Manual for the emissions estimations.

Two boiler types are proposed for the Demonstration Facility, a 1.5MW Steamtech D type and a 500Kw East Coast Vertical type. Peak fuel consumption loads are expected to be 154kg/h.

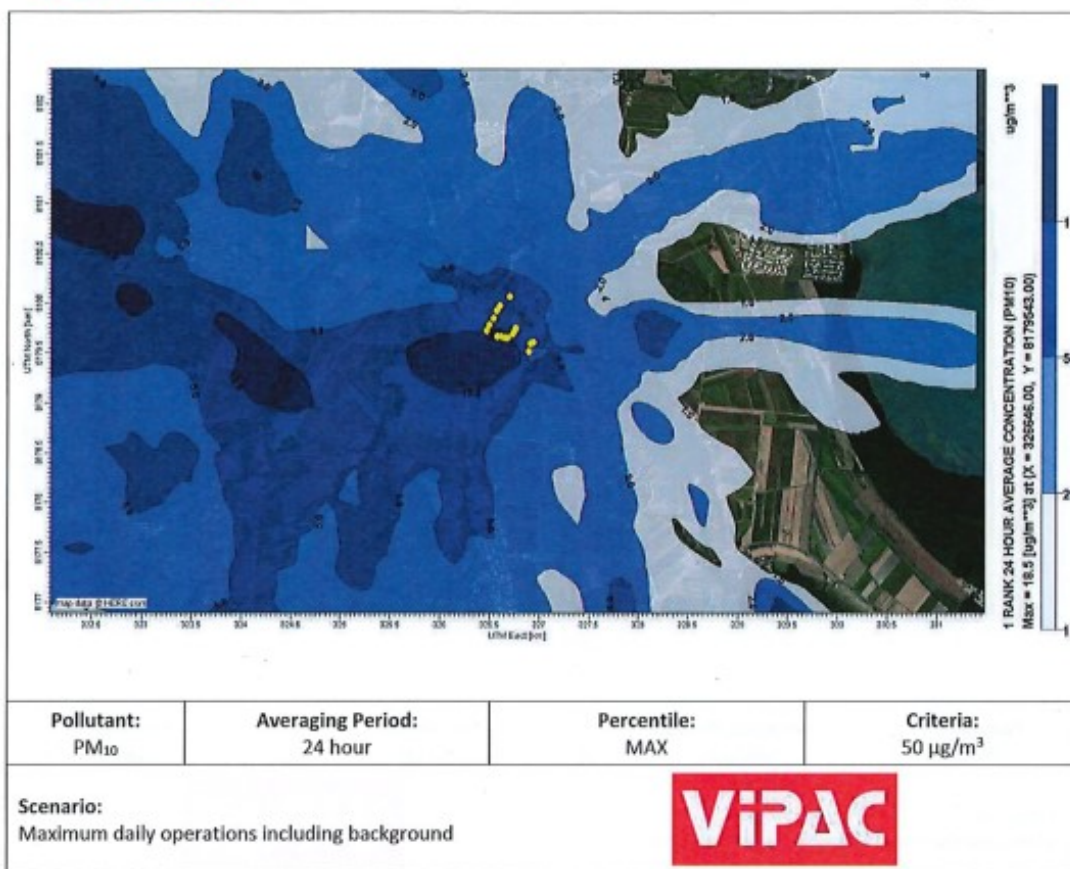
Table B-2: Boiler emission factors adopted

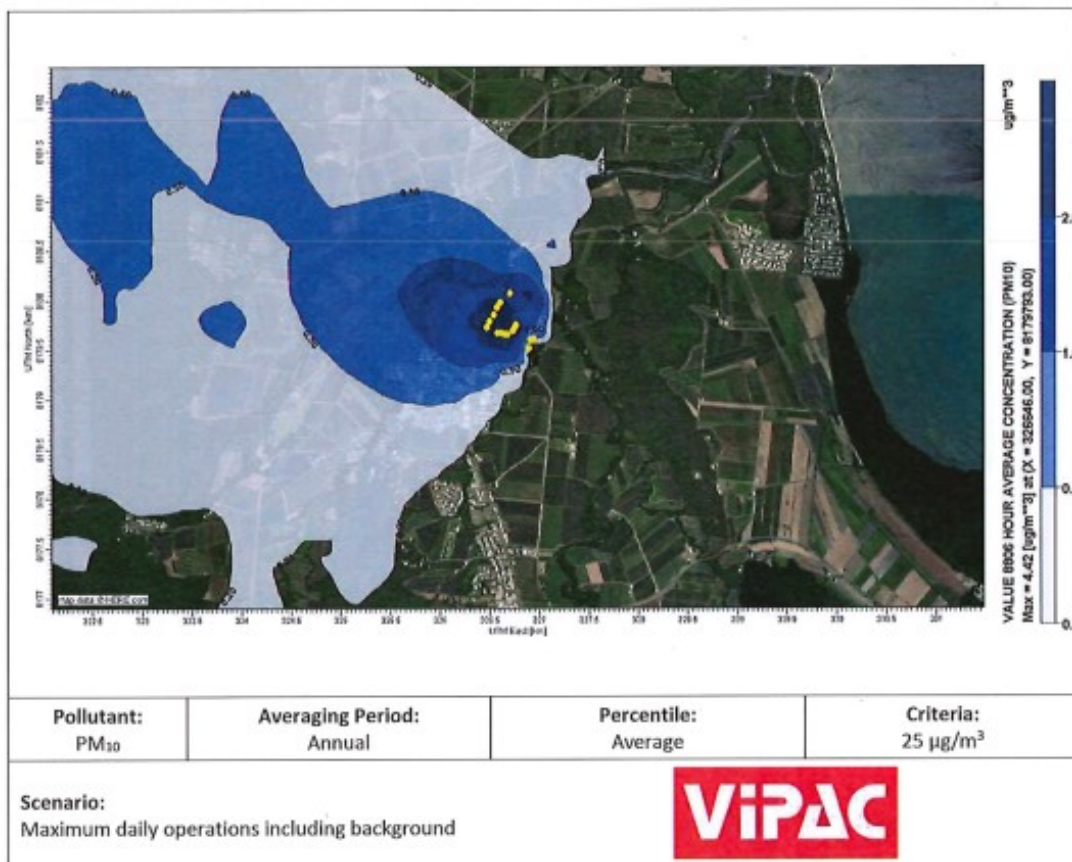
Pollutant	Emission factor (kg/t)
CO	0.75
NOx	4.46
PM ₁₀	0.26
PM _{2.5}	0.08
SO ₂	0.0041
VOC	0.06

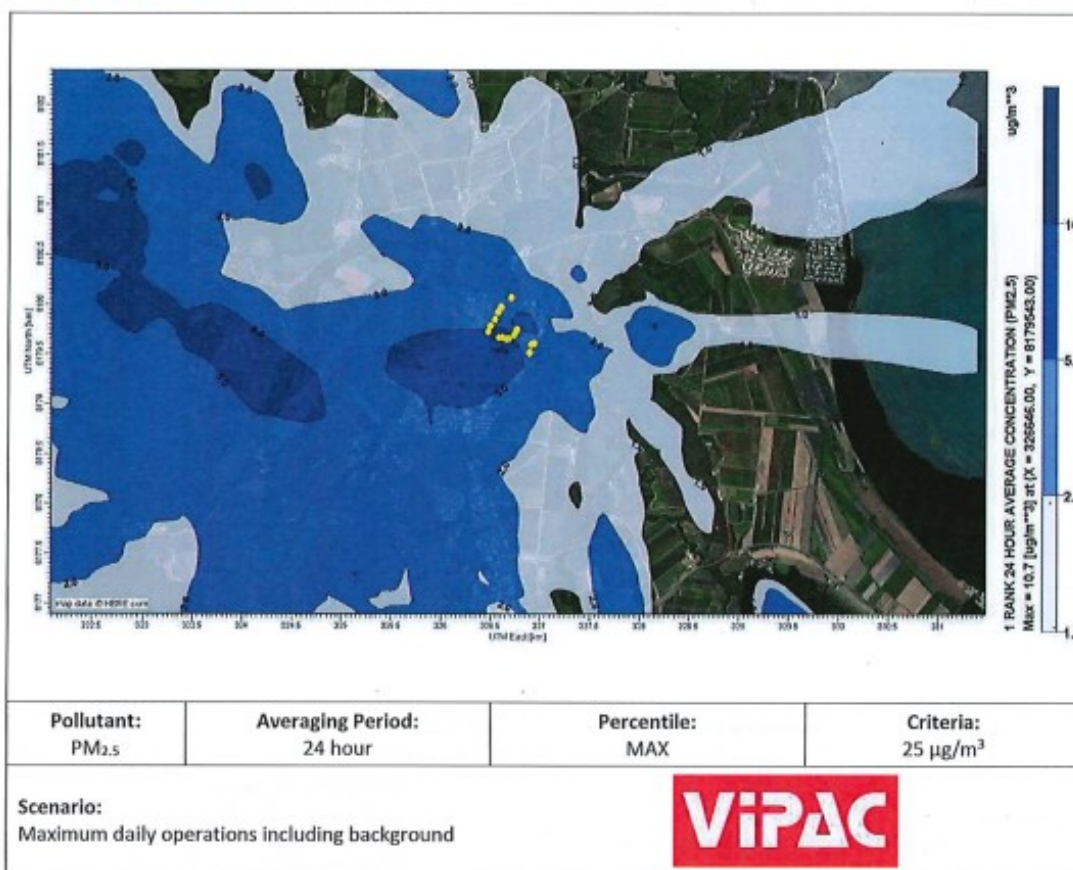


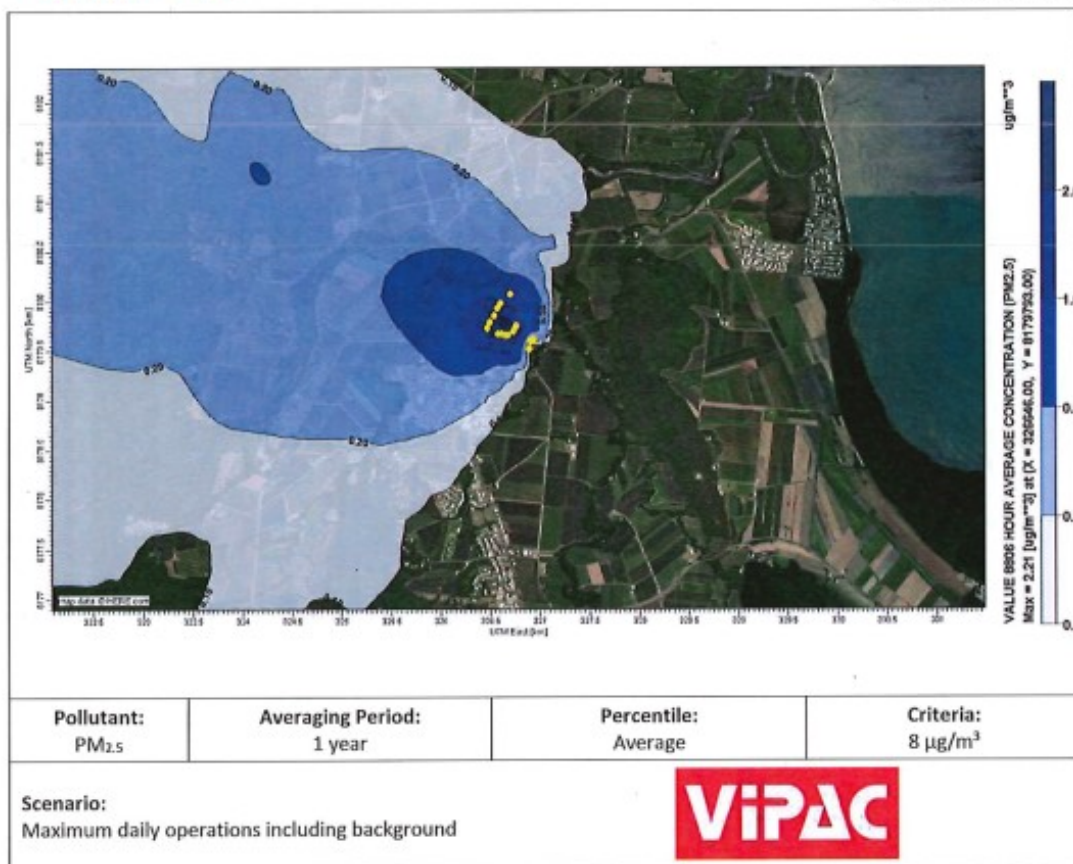
Appendix B CONTOUR PLOTS

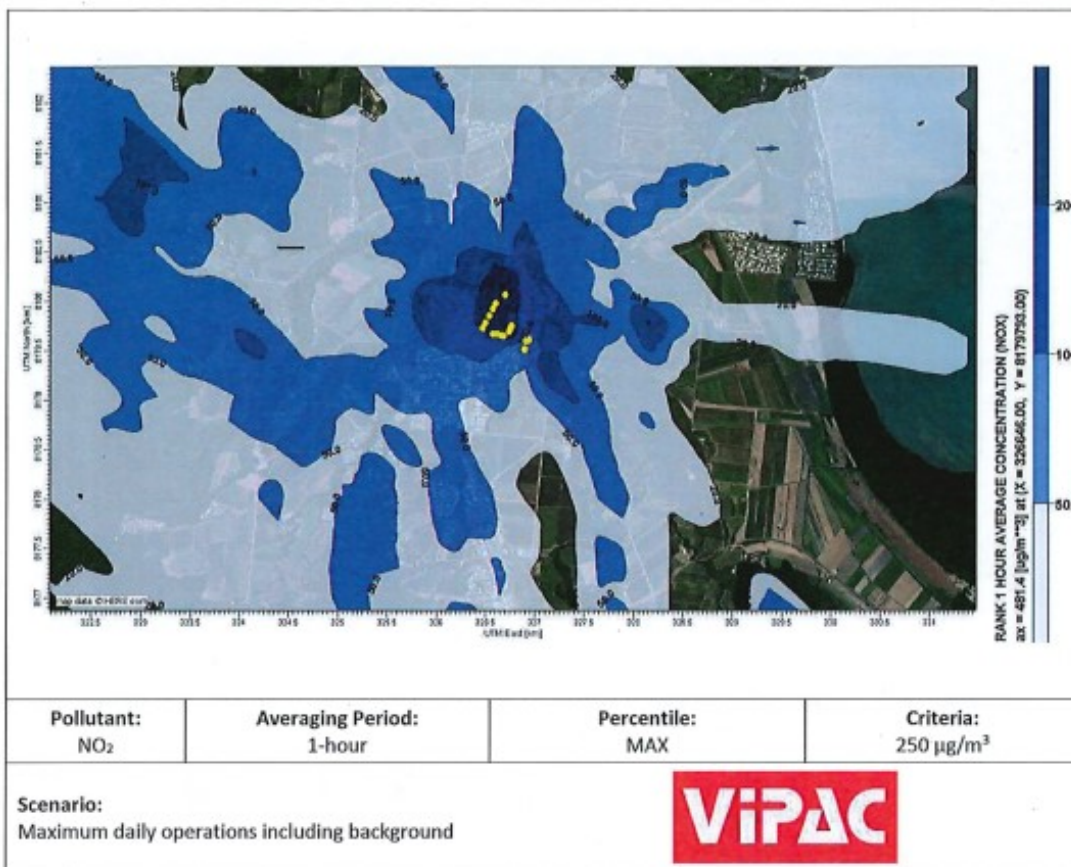
Canberra Town Planning PTY LTD
CTP Mossman Sugar Mill AQ Assessment
Air Quality Assessment

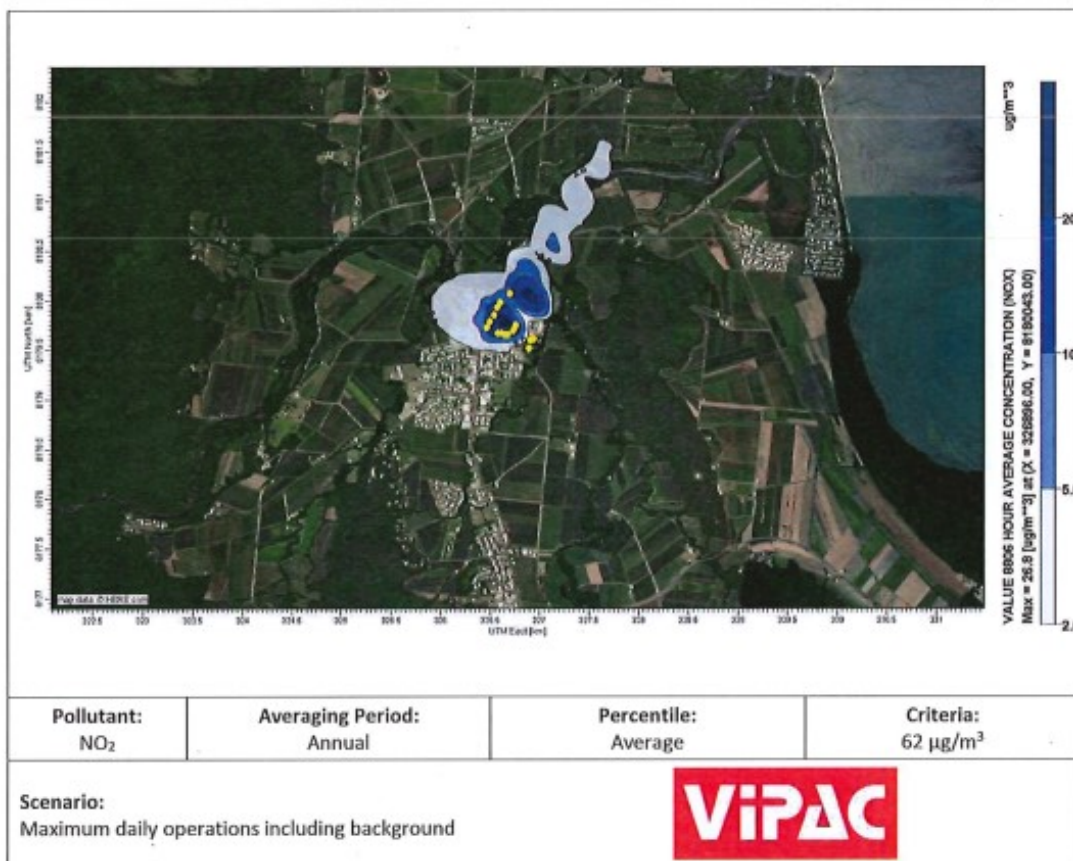


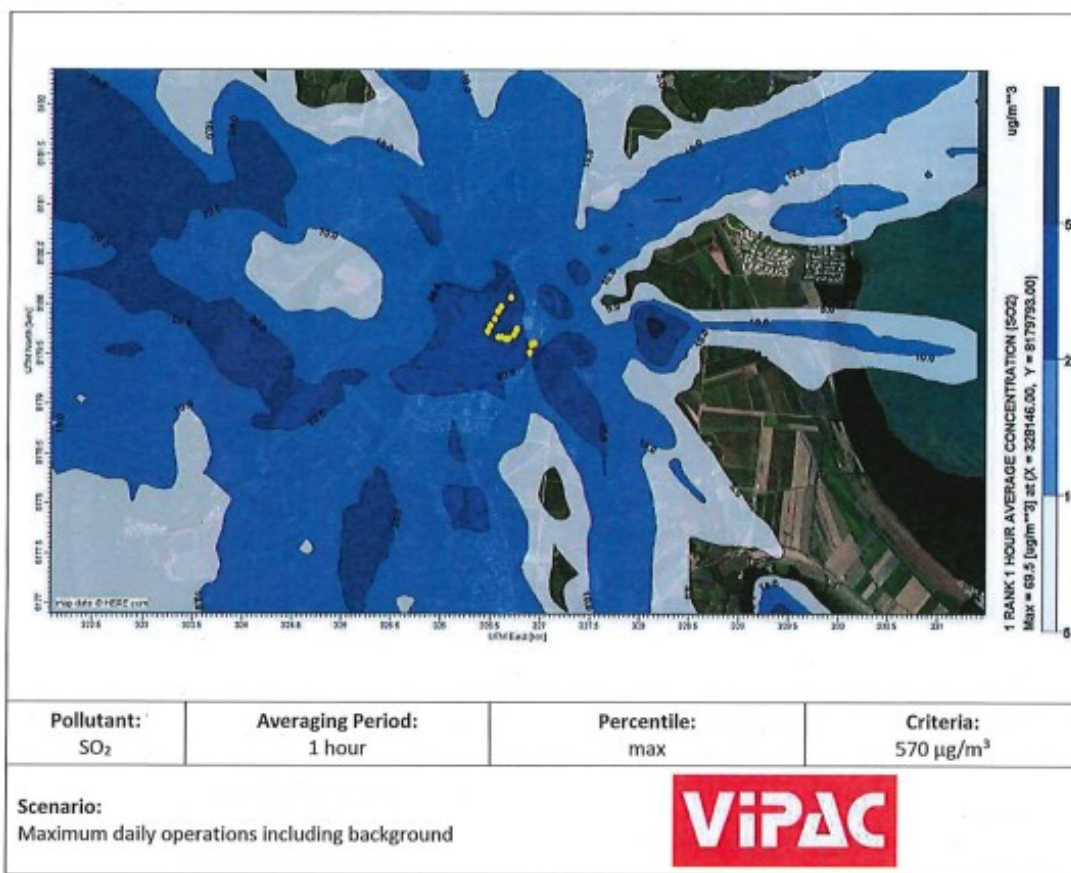


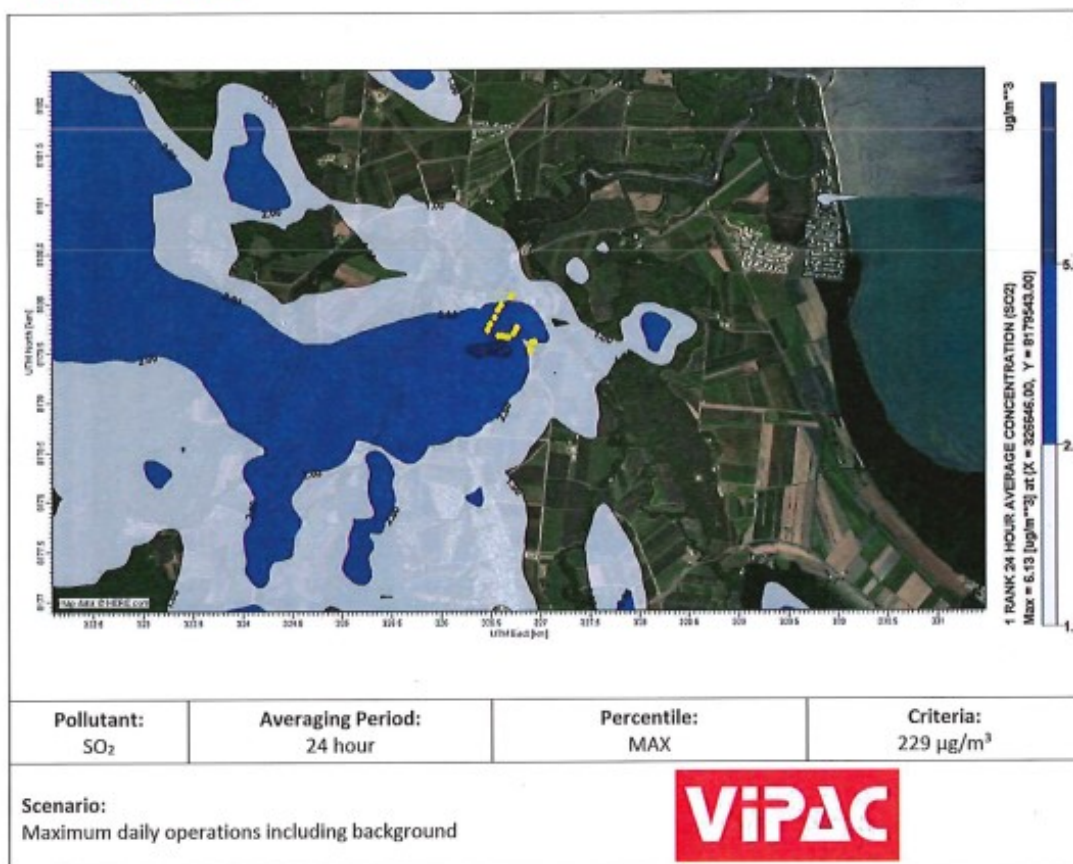


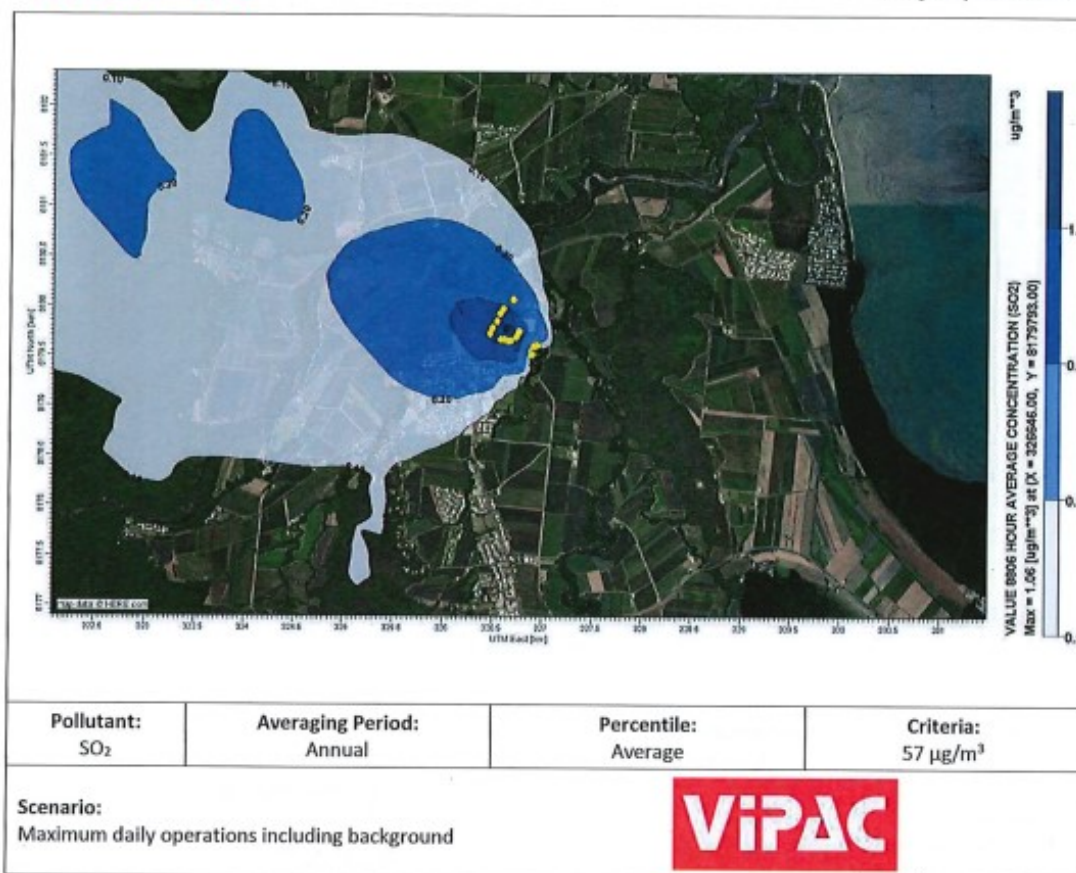


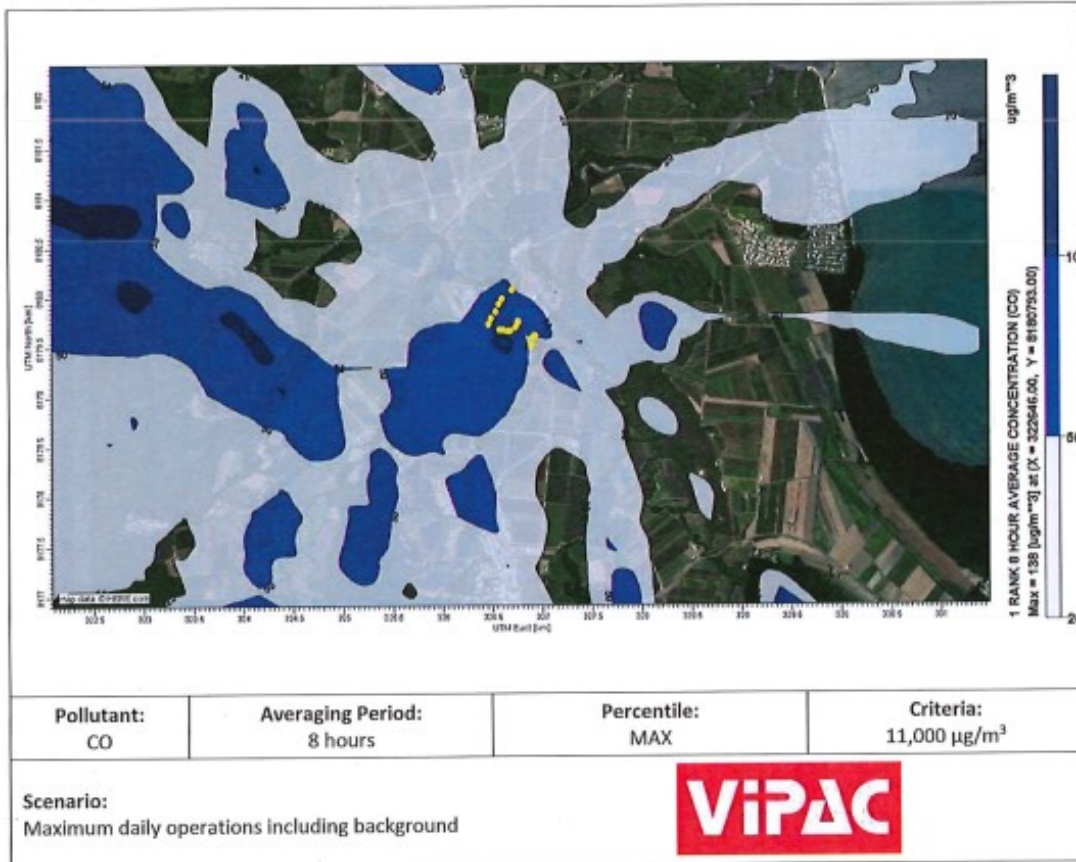














COCONUTZ AUSTRALIA PTY LTD

R&D Facility – 34 Mill Street, Mossman

STORMWATER QUALITY MANAGEMENT PLAN




Report No: CAN-0001/R01

Rev: 1

30 April 2021

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DOCUMENT AUTHORISATION					
Revision	Revision Date	Report Details			
1	30/04/21	Draft			
Prepared By		Reviewed By		Authorised By	
L. Hamilton		J. Cox		J. Cox	

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STORMWATER LAYOUT



1. INTRODUCTION

Premise Australia Pty Ltd (here within referred to as “Premise”) has been commissioned by CocoNutZ Australia Pty Ltd to prepare a Stormwater Quality Management Plan for the R&D Facility at 34 Mill Street, Mossman.

The Land Parcel which the development site and subject area pertain to include:

- Lot 27 on RP804231

The proposed works will comprise of the following components:

- Material change of use for research and technology industry; and
- Construction of an additional shed and associated bunkers

The shed and bunkers make up part of the material change of use including additional changes contained largely within existing buildings and structures on site.

Refer to **Figure 1** below for a Road Map Image of the site and its locality.

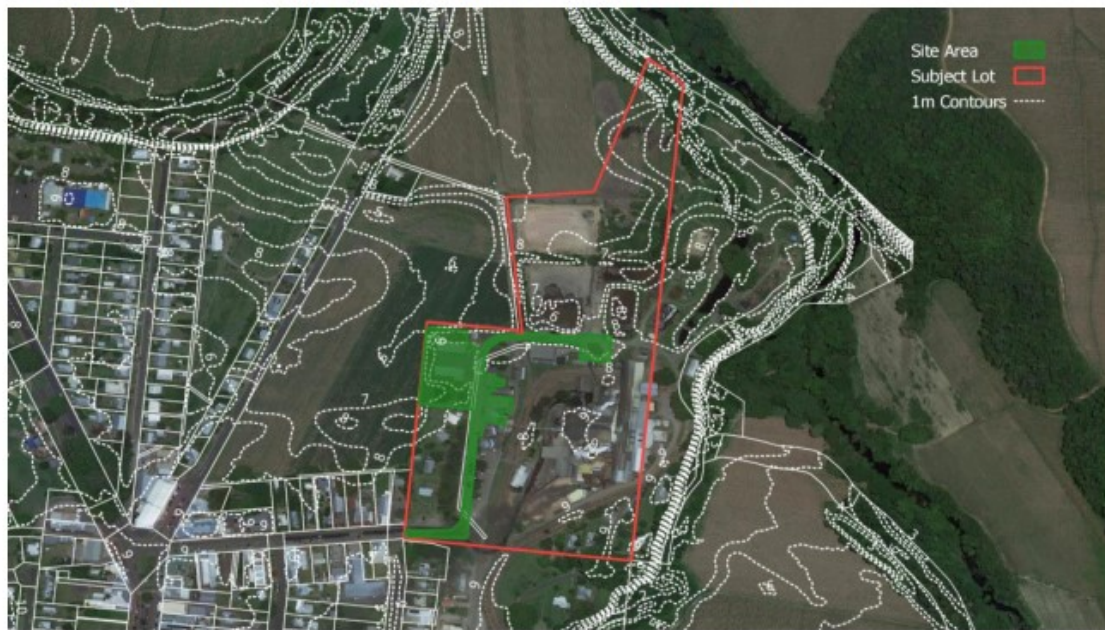


Figure 1 – Existing Study Area with Site area highlighted (Source: Planning Report – *Wolter Consulting*)

2. SITE CHARACTERISTICS

2.1 Site location

The subject site is located on Mill Street in Mossman and forms part of the existing Mossman Sugar Mill. It is formally known as Lot 27 on RP804231. The total area of the site is approximately 1.3ha and the total area of the proposed shed is approximately 365m².

The site is positioned at the north eastern edge of the Mossman Township, approximately 400m from Captain Cook Highway along Mill Street. It is located within the Douglas Shire Council Local Government Area.

2.2 Topography

The site is low lying and generally flat. Based off the topography, drainage of the subject site is generally as follows:

- Existing elevations range from R.L. 6.0-9.0
- Runoff flows generally from south to north
- Existing point of discharge to the creek adjacent to the site with runoff eventually contributing to Mossman River

3. PROPOSED DEVELOPMENT

The proposed development consists of the construction of an additional shed with associated bunkers for storage and a small hardstand area. The additional changes associated with the material change of use are largely to existing buildings and structures elsewhere on the site.

Figure 3 shows the proposed layout of the development.

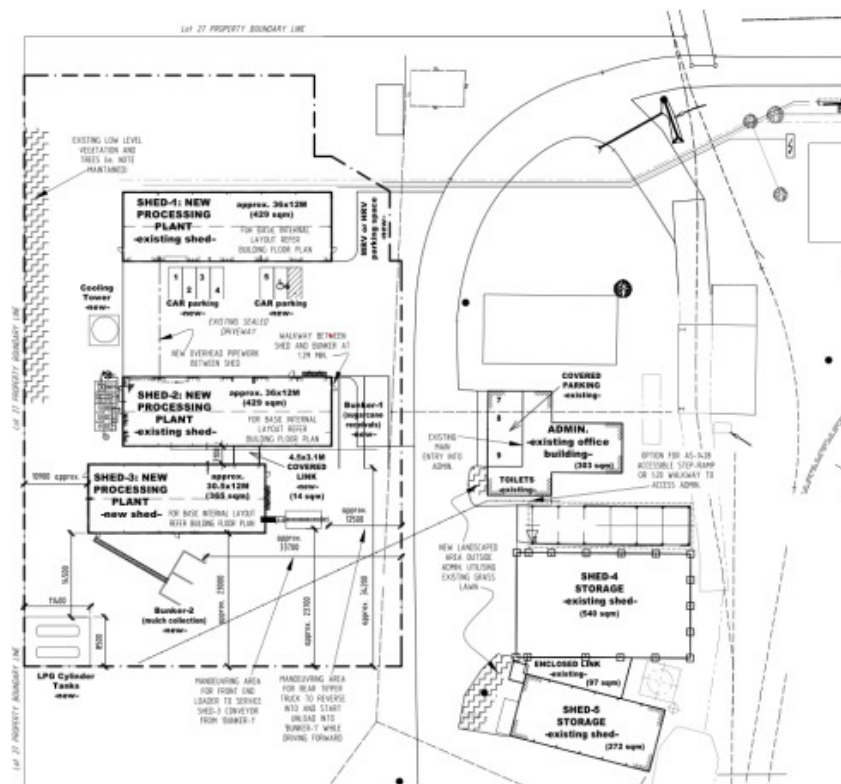


Figure 2 - Proposed Development Layout (Source: Gregory G Terzi Building Design & Drafting)

The proposed development plan has been attached in **Appendix A**.

3.1 Proposed Drainage

Proposed drainage for the shed includes collecting and conveying roofwater and surface runoff to a sump and pump system due to the gradient of the area being quite flat. The pump is intended to discharge to an effluent holding tank with a transfer pump to convey runoff to the Mill process and trade waste as a backup when the mill is offline.

A drainage layout plan has been prepared as part of the application and can be seen in **Appendix D**.

4. DATA

Data in the preparation of this report, information about the site was gathered from the following sources:

- Aerial LiDAR data by Department of Natural Resources and Mines;
- Proposed Site Layout provided by Gregory G Terzi Building Design & Drafting;
- Rainfall and Meteorological Data by the Australian Bureau of Meteorology;
- Aerial Imagery by Nearmap (Accessed on April 2021)

5. STORMWATER QUALITY

5.1 Stormwater Quality Treatment (Construction Phase)

During the construction phase various pollutants are generated which can find their way into the stormwater runoff. These pollutants can affect the quality of the stormwater runoff and hence pollute both the site and the downstream receiving environment. **Table 1** below outline the major sources of pollutants.

Table 1 Typical Construction Phase Pollutants

Construction Phase Pollutants
Litter from construction packaging, paper, food packaging, off cuts, etc.
Sediment from erosion of exposed soils and stockpiles.
Hydrocarbons - from fuel and oil spills, leaks from construction equipment.
Toxic Materials - cement slurry, solvents, cleaning agents, wash waters.
pH altering substances - cement slurry, wash waters.

Erosion and sediment control measures used during the construction phase of the development will be designed and installed in accordance with International Erosion Control Association (Australasia) - "Best Practice Erosion & Sediment Control – for building and construction sites" November 2008 as well as Table 9.4.5.3.b of the Douglas Shire Council Planning Scheme infrastructure Works Code.

5.2 State Planning Policy Compliance

The latest Stormwater Management Design Objectives (SMDO's) have been adopted from Table 9.4.5.3.c of the Douglas Shire Council Planning Scheme infrastructure Works Code for the operational phases of the development and are detailed in **Table 2** below.

Table 2 Stormwater Quality Objectives

Pollutant	Reductions in mean annual load from unmitigated development (%)
Suspended Solids	80
Total Phosphorus	60
Total Nitrogen	40
Gross Pollutants	90

5.3 Stormwater Quality Modelling

Stormwater Pollutant modelling for the development has been generated using the modelling program 'Model for Urban Stormwater Improvement Conceptualisation' (MUSIC), version 6.3.0, adhering to the prescribed Far North Queensland Regional Organisation of Councils Stormwater Quality Design Manual Version No. 03/17 (FNQROC). An assessment was undertaken for both a bioretention system or proprietary system manufactured by SPEL Environmental to provide 2 options of stormwater quality treatment for the development. Details of Catchment assumptions can be seen in **Table 3**.

Table 3 MUSIC Model Catchment Parameters

Catchment ID	Node Type	Total Area (ha)	Fraction Impervious
Shed Roof - Commercial	Industrial	0.036	100%
Bunkers 1 (Roof)	Industrial	0.003	100%
Bunkers 2 (Roof)	Industrial	0.014	100%
Concrete (Sealed Road)	Industrial	0.018	100%

A snapshot of the MUSIC model setup for both options can be seen below.

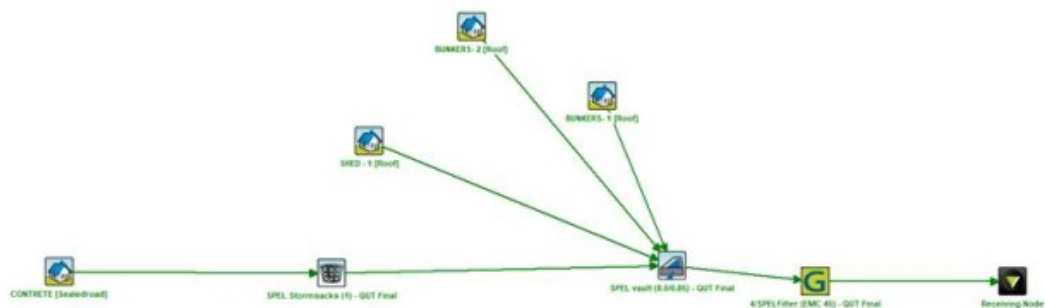


Figure 3 – Option 1 – SPEL Filter and Vault MUSIC Model layout

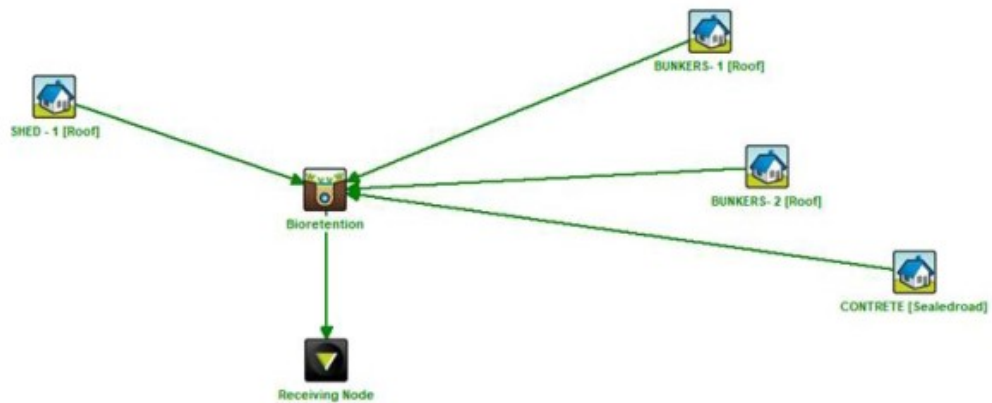


Figure 4: Option 1 – Bioretention MUSIC Model layout

5.4 SPEL StormSack – Option 1

The SPEL StormSack provides effective filtration of solid pollutants and debris typical of urban runoff. It is designed to rest on the flanges of conventional catch basin frames. The parameters for the treatment system are provided in the table below.

Table 4 Treatment Device parameters – Spel Stormsack

Component	Device Parameters
Low Flow By-pass (m3/s)	0
High Flow By-pass (m3/s)	0.01100
Total Suspended Solids (Inflow, outflow) 1 (mg/L)	0,0
Total Suspended Solids (Inflow, outflow) 2 (mg/L)	100.0, 39.0
Total Phosphorus Inflow (mg/L)	100.0
Total Phosphorus Outflow (mg/L)	72.0
Total Nitrogen Inflow (mg/L)	100.0
Total Nitrogen Outflow (mg/L)	55.0
Gross Pollutants Inflow (kg/ML)	15.0
Gross Pollutants Outflow (kg/ML)	0

5.5 SPELFilter and Vault – Option 1

The Stormwater Management StormFilter™ cleans stormwater through a patented passive filtration system, effectively removing pollutants to meet the most stringent regulatory requirements. The StormFilter stormwater treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain the most challenging pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals, and other common pollutants. The parameters for the treatment systems are provided in **Table 5** and **Table 6**.

Table 5 Treatment Device parameters – SPEL Vault

Component	Device Parameters
Low Flow By-pass (m3/s)	0
High Flow By-pass (m3/s)	100
Surface Area (m ²)	8.0
Extended Detention Depth (m)	0.85
Exfiltration Rate(mm/hr)	0.00
Evaporative Loss as % of PET	0.00
Low Flow Pipe Diameter (mm)	90.0
Overflow Wier Width (mm)	5.0

Table 6 Treatment Device parameters – SPELFilter (4 x EMC 45 Filters)

Component	Device Parameters
Low Flow By-pass (m3/s)	0
High Flow By-pass (m3/s)	0.01132
Total Suspended Solids (Inflow , outflow) 1 (mg/L)	0,0
Total Suspended Solids (Inflow , outflow) 2 (mg/L)	100.0, 22.0
Total Phosphorus Inflow (mg/L)	100.0
Total Phosphorus Outflow (mg/L)	41.0
Total Nitrogen Inflow (mg/L)	100.0
Total Nitrogen Outflow (mg/L)	58.0
Gross Pollutants Inflow (kg/ML)	15.0
Gross Pollutants Outflow (kg/ML)	0

5.6 Bioretention – Option 2

A bioretention has been identified as the second treatment solution option for the stormwater runoff generated from the development. The core assumption is that the runoff will be collected and conveyed to bioretention basin to be treated before leaving the site. The typical section for a bioretention basin as described in the Deemed to Comply Solutions – Stormwater Quality Management (Water by Design) is shown below,

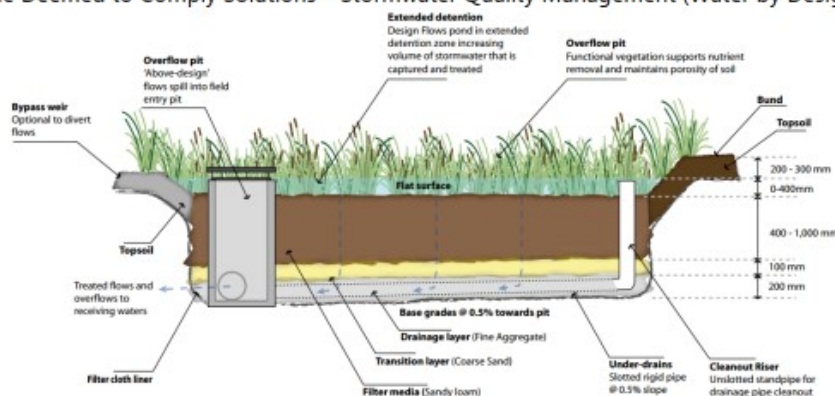


Figure 5: Typical Bioretention Section - Retrieved from Deemed to Comply Solutions (Water by Design)

Table 7 Treatment Device parameters – SPEL Vault

Component	Device Parameters
Low Flow By-pass (m3/s)	0
High Flow By-pass (m3/s)	100
Surface Area (m ²)	18.0
Extended Detention Depth (m)	0.30
Filter Area	18.0
Saturated Hydraulic Conductivity (mm/hour)	200
Filter Depth (m)	0.4
TN Content of Filter Media (mg/kg)	400
Orthophosphate Content of Filter Media (mg/kg)	55.0

5.7 Treatment Train Effectiveness

Table 8 and **Table 9** outline the effectiveness of the MUSIC Model Treatment Train in achieving the set Stormwater Management Design Objectives (SMDO's) for pollutant reduction for the proposed Development.

Table 8 Treatment Train Effectiveness at Receiving Node – Option 1 (SPEL)

Pollutant	Unmitigated Load (kg/yr)	Mitigated Load (kg/yr)	Reduction (%)
Suspended Solids (TSS)	63.2	11.9	91.3
Total Phosphorus (TP)	0.381	0.137	75.6
Total Nitrogen (TN)	6.83	2.76	50.9
Gross Pollutants > 5mm	37.5	0	100

Table 9 Treatment Train Effectiveness at Receiving Node – Option 2 (Bioretention)

Pollutant	Unmitigated Load (kg/yr)	Mitigated Load (kg/yr)	Reduction (%)
Suspended Solids (TSS)	63.2	11.9	89.5
Total Phosphorus (TP)	0.381	0.137	60.6
Total Nitrogen (TN)	6.83	2.76	61.8
Gross Pollutants > 5mm	37.5	0	100

6. STORMWATER QUALITY MAINTENANCE

Prior to commencement of construction, and Erosion and Sediment Control Plan (ESCP) will be prepared and implemented to minimise the impacts on stormwater quality. The plan will address site and catchment specific erosion control measures, generally adhering to the following control measures.

6.1 Pre-Construction

Before construction the following measures will be established and maintained for any disturbed areas:

- Stockpile areas to be designated to minimise impacts on site runoff;
- Provision of shakedown pit for any entry/exit points to the site; and
- Toolbox talk to inform any regular site personnel

6.2 During Construction

- Construction related activities will be contained within the subject site where possible to minimise areas of disturbance;
- Topsoil retention for site rehabilitation;
- Regular inspection of sediment control measures; and
- Dynamic response to any changing site conditions

6.3 Post-Construction

Following construction any disturbed areas will be stabilised through revegetation which is to be maintained until established.

6.4 Proprietary Devices

The stormwater quality devices that are to be supplied by SPEL have specific maintenance procedures. Refer to **Appendix B** for the maintenance plans provided by SPEL.

7. CONCLUSION

The Stormwater Quality Improvement Devices (SQID's) proposed for the development include the option of a SPEL Filter or a bioretention system. The MUSIC modelling of the proposed treatment train demonstrates the Douglas Shire Council's Pollutant Load SMDO's are achieved for the works.

As such, by implementing the treatment system outlined in this report into the proposed development, stormwater runoff from the site will be treated to the satisfaction of the Douglas Shire Council Planning Scheme.

8. QUALIFICATIONS

Our analysis and overall approach have been specifically catered for the requirements of CocoNutZ Australia Pty Ltd and may not be applicable beyond this scope. For this reason, any other third parties are not authorised to utilise this report without further input and advice from Premise.

9. RPEQ CERTIFICATION

As Registered Professional Engineer of Queensland (RPEQ) for this project, on behalf of Premise Australia Pty Ltd, I certify that the modelling undertaken as part of this assessment has been undertaken in accordance with current engineering best practice as recommended in the State Planning Policy.

Name: Jeremy Cox

RPEQ No: 14732

Date: 30th April 2021

Signature: 

10. REFERENCES

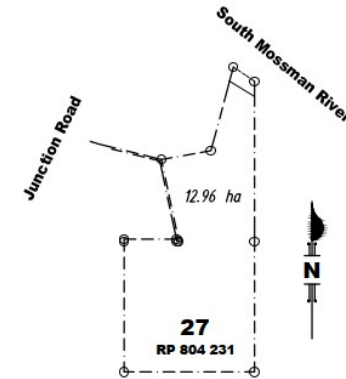
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APPENDIX A DEVELOPMENT PLAN



**FORMING PART OF Lot 27
PROPOSED SITE AREA**

CURRENT QLD GLOBE EXTRACT (approx. 1:2500 ON A3)

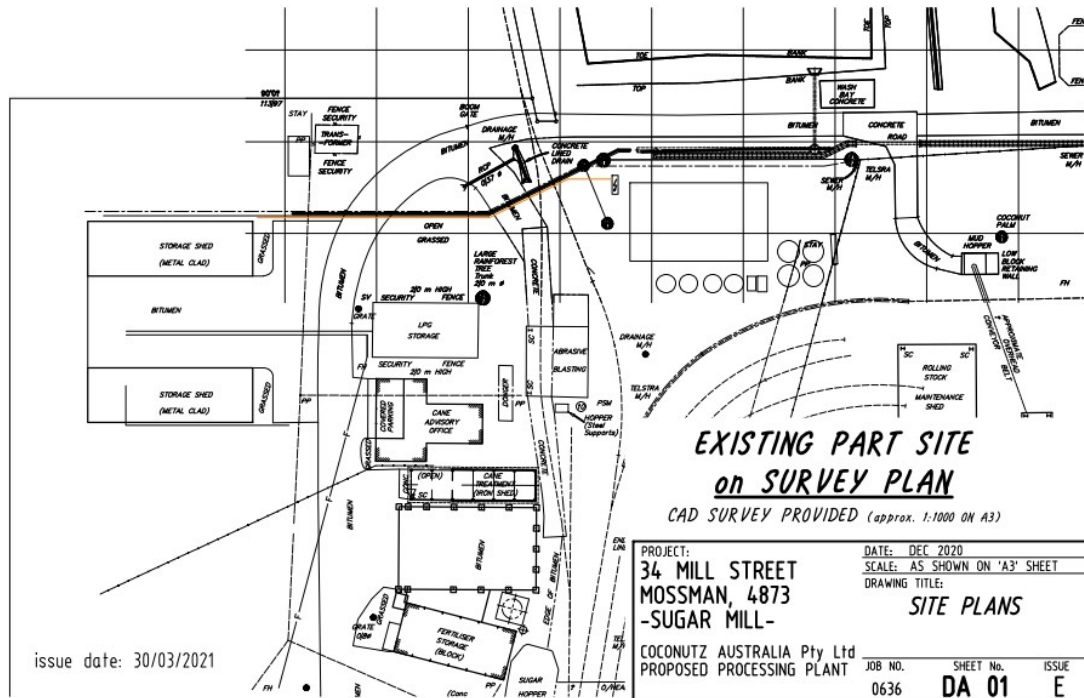


Lot 27 RP804231

PROPERTY BOUNDARIES

(SCALE 1:10,000 ON A3)

phones: 0428 794 235 EDMONTON 4869 QUEENSLAND
GREGORY G TERZI Architectural Drafter Building Design & Drafting
 -Building Designer- -OBCC LICENCE: 111704-8-



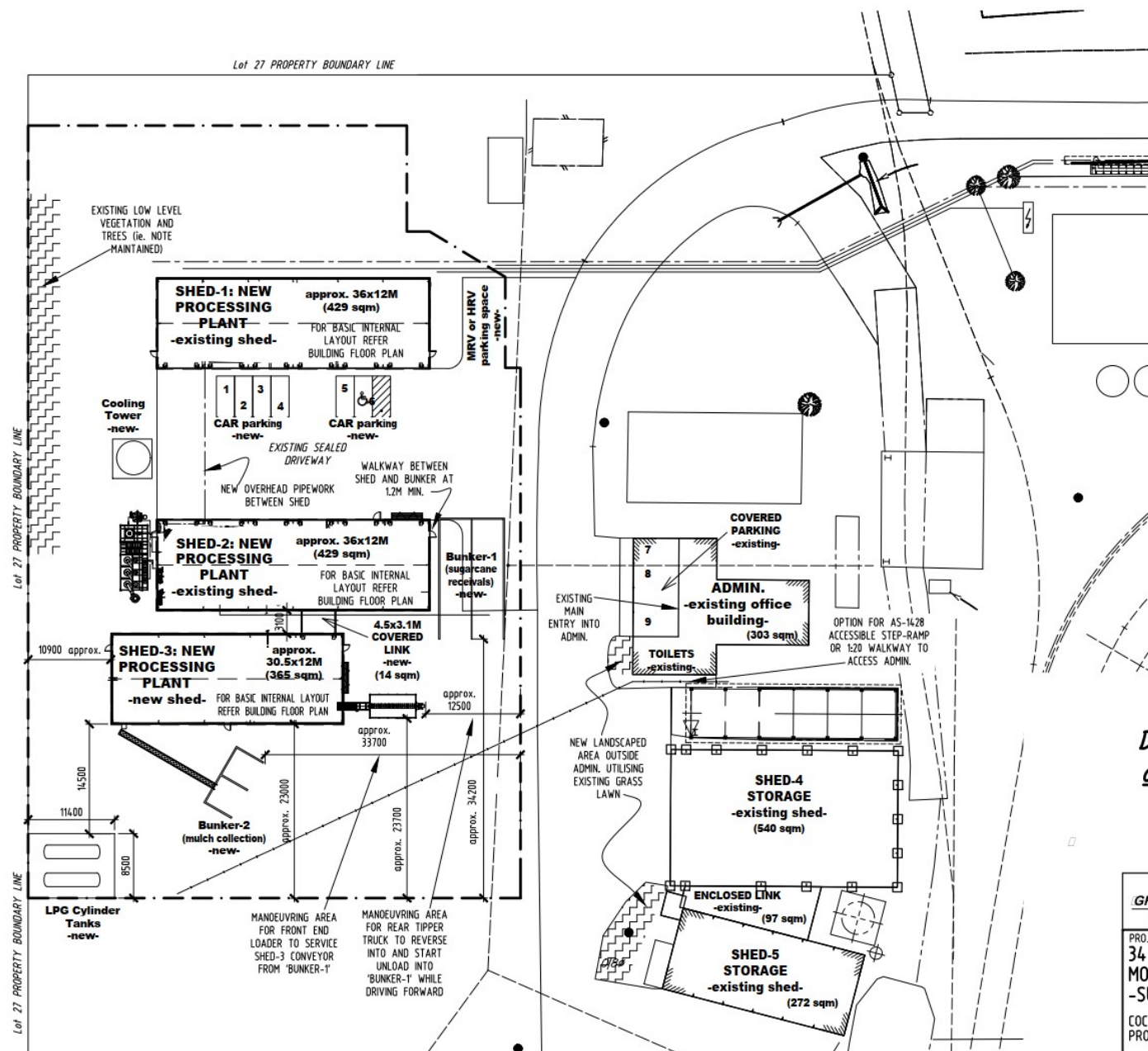
**EXISTING PART SITE
on SURVEY PLAN**

CAD SURVEY PROVIDED (approx. 1:1000 ON A3)

PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	SITE PLANS
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. 0636
PROPOSED PROCESSING PLANT	SHEET No. DA 01
	ISSUE E

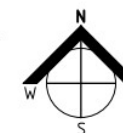
issue date: 30/03/2021

issue date: 30/03/2021

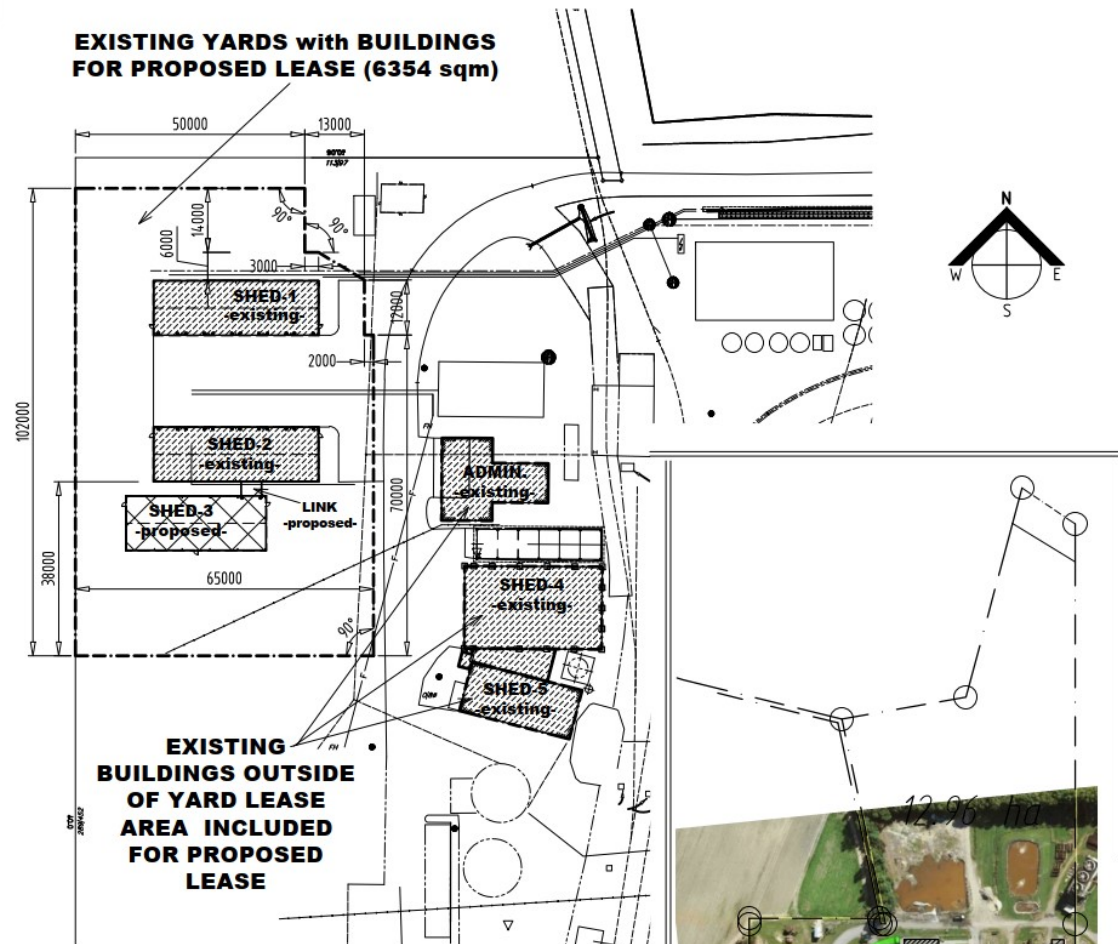


DETAIL SITE PLAN on SURVEY PLAN

CAD SURVEY PROVIDED
(approx. 1:500 ON A3)



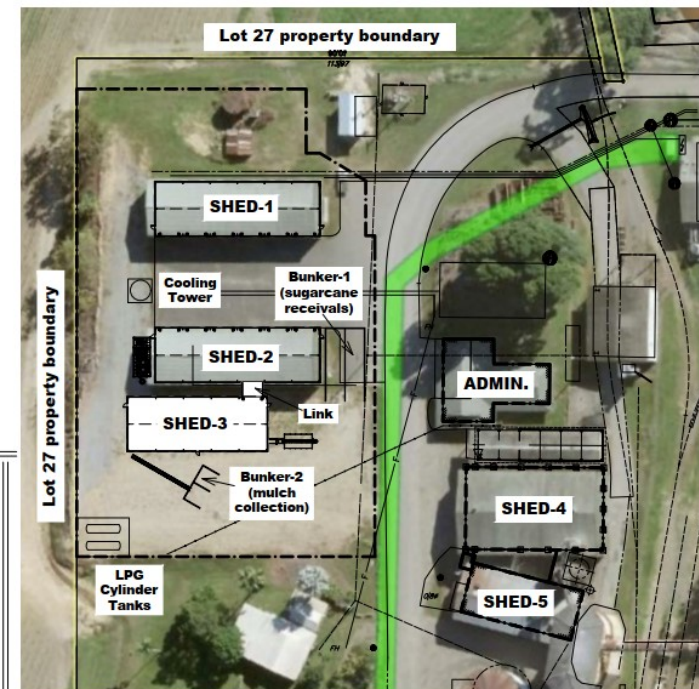
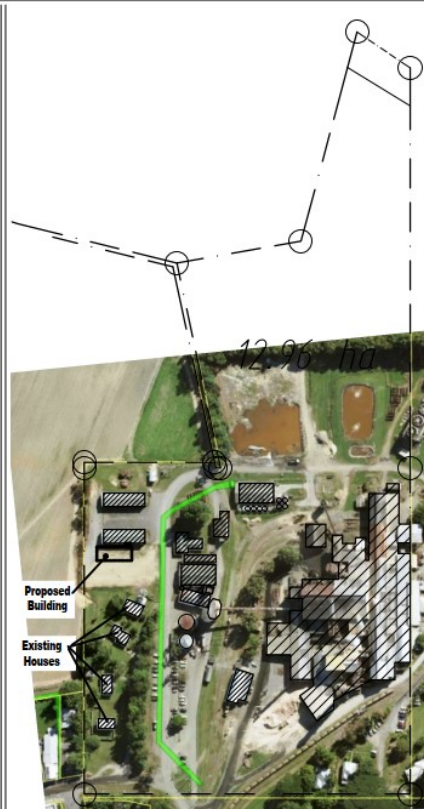
phone: 0428 294 235 EDMONTON 4869, QUEENSLAND	
GREGORY G TERZI	Associate Systems Architectural Technology
Building Design & Drafting	
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-	
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	proposed
	DETAIL SITE PLAN
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. SHEET No. ISSUE
PROPOSED PROCESSING PLANT	0636 DA 03 D



**PROPOSED LEASED AREA & BUILDINGS
on SURVEY PLAN**

CAD SURVEY PROVIDED
(approx. 1:1000 ON A3)

phone: 0428 294 235 EDMONTON 4869, QUEENSLAND
GREGORY G TERZI Associate Diploma
Architectural Technology Building Design & Drafting
-Building Designer- -Medium Rise- -QBCC LICENCE: 1117048-



**PROPOSED LEASED AREA & BUILDINGS
on AERIAL VIEW / SURVEY PLAN**

CURRENT QLD GLOBE EXTRACT
(approx. 1:1000 ON A3)

PROPERTY BREAK DOWN FOR SITE COVER:

TOTAL SITE AREA = 12.96 ha OR 129,600 sqm

- PROPOSED BUILDINGS = approx. 0.3% of site
- EXISTING MILL AND OTHER ASSOCIATED MAIN BUILDINGS (Built-up) = approx. 13% of site
- EXISTING HOUSES = approx. 0.5% of site

REMAINING AREA = approx. 86.2% of site

PLANNING

SCHEME INFO.

(approx. sqm)

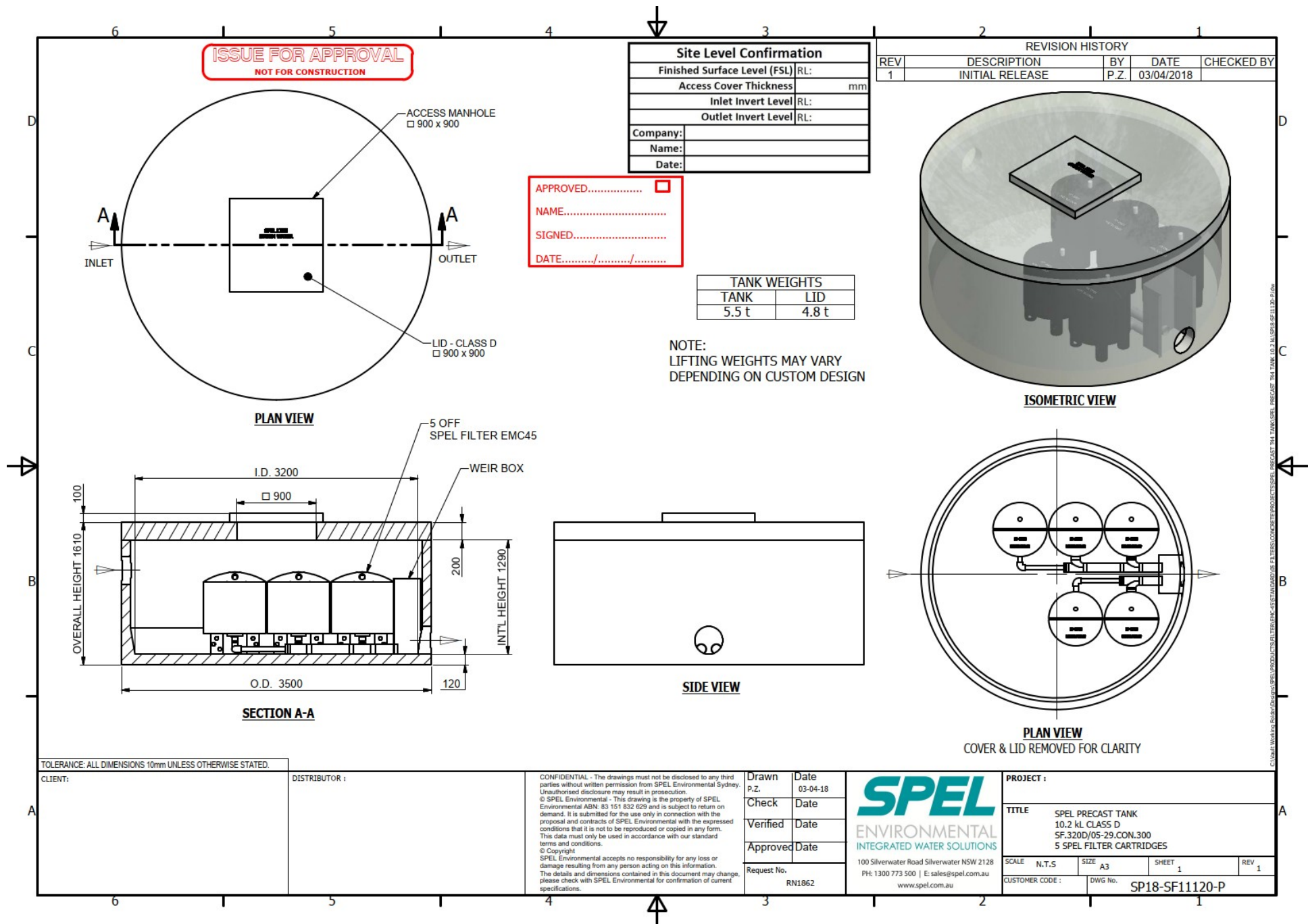
PROJECT:	DATE: DEC 2020
34 MILL STREET	SCALE: AS SHOWN ON 'A3' SHEET
MOSSMAN, 4873	DRAWING TITLE:
-SUGAR MILL-	SITE PLANS
COCONUTZ AUSTRALIA Pty Ltd	JOB NO. SHEET No. ISSUE
PROPOSED PROCESSING PLANT	0636 DA 02 C

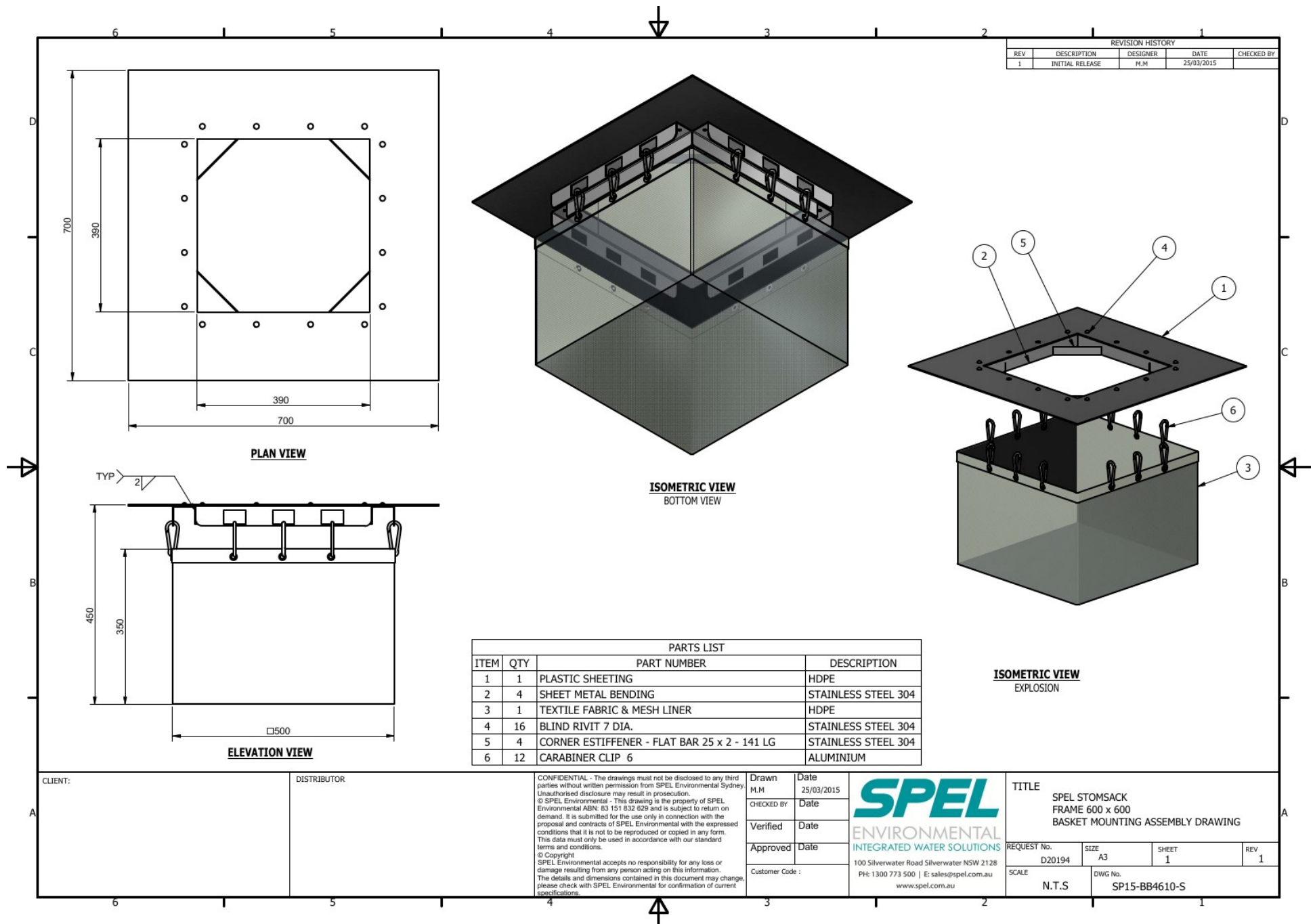
issue date: 30/03/2021

APPENDIX B

STORMWATER QUALITY DEVICE PRODUCT SPECIFICATIONS







Model Number

Job Number



SPEL StormSack

OPERATIONS & MAINTENANCE

www.spel.com.au

SPEL ENVIRONMENTAL
INTEGRATED WATER SOLUTIONS

Maintenance of the SPEL StormSack is essential to preservation of its condition to ensure lifetime operational effectiveness.

The SPEL StormSack is a highly engineered water quality device that is deployed directly in the stormwater system as primary treatment to capture contaminants close to the surface. To ensure full operational capacity, it is vital to ensure that the pollutants it captures are periodically removed, and filtration components are thoroughly cleaned.

Maintenance frequencies and requirements of the SPEL StormSack are dependent on the biological factors of the site in which it is situated. These factors can include excessive sediment loading or occurrence of toxic chemicals due to the natural and unnatural factors such as site erosion, chemical spills or extreme storms.

This manual has been designed by the SPEL StormSack Manufacturer the client or device owner in the maintenance of the SPEL StormSacks.

This manual should be used in conjunction with the relevant site traffic management and safety plans, as well as any other provided documentation from SPEL.

1. General Description

The SPEL StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The StormSack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.

Components:

- a. Adjustable Flange and Deflector: Aluminium Alloy 6063-T6
- b. Splash Guard: neoprene rubber
- c. StormSack: woven polypropylene geotextile with US Mesh 20
- d. Corner Filler: Aluminium Alloy 5052-H32
- e. Lifting Tabs: Aluminium Alloy 5052-H32
- f. Replaceable Oil Boom: polypropylene 3 inch (76 mm) diameter
- g. Mesh Liner: HDPE, diamond configuration
- h. Support Hardware: CRES 300 Series

Sizes:

STANDARD SPEL STORMSACK TO SUIT PIT SIZES

- 450x450mm
- 600x600mm
- 900x600mm
- 900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times.

1. Personal Health & Safety

When carrying out maintenance operations of the SPEL StormSack all contractors and staff personnel must comply with all current workplace health and safety legislation.

The below measures should be adhered to as practically as possible:

- Comply with all applicable laws, regulations and standards
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

2. Personal Protective Equipment

When carrying out maintenance operations of the SPEL StormSack, wearing the appropriate personal protective equipment is vital to reducing potential hazards. Personal protective equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots



3. Maintenance of the SPEL StormSacks is a specialist activity.

When carrying out maintenance operations of the SPEL StormSack, factors such as equipment handling methods, pollutants and site circumstances can impose potential risks to the maintainer and nearby civilians.

4. Captured Pollutants

The material captured by the SPEL StormSack can be harmful and needs to be handled correctly. The nature and amount of the captured pollutants depends on the characteristics of the site. Pollutants can include from organic material such as leaves and sticks through to debris such as plastics, glass and other foreign objects such as syringes.

5. Site Circumstances

It is essential that Occupational Safety and Health guidelines and site specific safety requirements are followed at all times. It is important that all following steps specified by SPEL are carried out to ensure safety in the entire maintenance operation. The general workplace hazards associated with working outdoors also need to be taken into account.

6. Equipment Handling

Handling activities such as removing the drain grate as well as managing pedestrians and other non-worker personnel at the site should be exercised in accordance with specified safety procedures and guidelines.

7. Confined Spaces

Confined space entry procedures are not covered in this manual. It is requested that all personnel carrying out maintenance of the SPEL StormSack must evaluate their own needs for confined space entry and compliance with occupational health and safety regulations

When maintenance operations cannot be carried out from the surface and there is a need to enter confined space, only personnel that currently hold a Confined Space Entry Permit are allowed to enter the confined space. All appropriate safety equipment must be worn, and only trained personnel are permitted to use any required breathing apparatus gear. Necessary measures and controls must always be exercised to meet the confined space entry requirements. Non trained staff are not permitted to participate in any confined space entries.

8. Traffic Management

Typically stormwater gully pits are situated on roads and carparks, or adjacent to roads in a footpath or swale. As traffic requirements vary depending on the circumstance of the site, separate traffic control plans should be prepared for each site.

The specific road safety requirements for each site can be obtained from the relevant road authority to ensure all maintenance operations comply with the laws and regulations. State government publications can also be useful to find out the signage requirements, placement of safety cones and barricades that are required when working on public roads.

1. General Monitoring

The SPEL StormSack must be checked on a regular basis to analyse whether it requires maintenance or cleaning.

As gully pit grates are usually quite heavy, it is vital to exercise the correct lifting techniques and also ensure that the area surrounding the open pit is shielded from access of non-work personnel.

To ensure optimal performance of the SPEL StormSack, the material collected by the filter bag should not exceed the level of approximately a half to two thirds of the total bag depth. When this material collected is showing signs of exceeding this level they should be scheduled to be emptied.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when previous months have had little or no rainfall.



2. Gully Pit Cover Removal

Opening a Hinged Pit Cover

- A. Insert the lifting hooks beneath the grate
- B. Check hinge points are not damaged and debris is not caught in the hinge area
- C. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held, should be removed or secured during maintenance activities.



Opening a Non-Hinged Pit Cover

- A. Place lifting hooks beneath grate, where possible in the four corners of the grate. Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters. Alternatively if safe to do so grip the grate with your hands.
- B. Position each person on either side of the grate.
- C. Lift the grate, ensuring that good heavy lifting posture is used at all times.
- D. Place the grate on angle on the gutter, to allow for the lifting hooks to be removed.
- E. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back.



3. Cleaning Methods

Cleaning using an inductor truck

- A. Open Gully pit
- B. Place the indicator hose, suck out all of the sediment, organic leaf material, litter and other materials that were collected in the filter bag
- C. Allow the filter bag to be sucked up in the inductor hose for a few seconds to allow for the filter mesh pores to be cleaned.
- D. Use the inductor hose to remove any build-up of material around the overflows and in the bottom of the pit.
- E. Remove filter back from pit
- F. Remove any sediment and litter caught in the Gully pit grate
- G. Back opening channels are to be cleared of any debris to ensure flow is not hindered.
- H. Thoroughly examine the structural integrity of the filter bag and frame.
- I. Reinstall filter bag and gully pit covers

Hand Maintenance

- A. Open Gully pit
- B. Using the correct lifting technique, lift the StormSack out by the diagonal lifting corners fitted to the frame.
- C. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the StormSack, or remove excess material using a shovel or etc. Take care not to damage the bag when removing litter from the bag.
- D. Lift the StormSack clear of the stormwater pit.



- E. Position the StormSack over the collection bin or vehicle.
- F. Lift and empty the bag by holding the bottom lifting loops only.
- G. Brush the StormSack with a stiff brush to remove the sediment from the filter pores.
- H. Thoroughly examine the structural integrity of the filter bag and frame.
- I. Reinstall StormSack and gully pit covers.



4. SPEL StormSack Post Maintenance Inspection

After the SPEL Stormsack has been removed, emptied and cleaned, it should be thoroughly examined to sure that:

- There is no movement or damage to the Cage
- There is no movement or damage to the plastic pit seals
- Structural integrity is in good condition including all fixings, joints and connections.
- The filter bag pores are not clogged
- The filter bag is not damaged in anyway.

The gully pit, pipe inlet/outlets and its cover should also be inspected to ensure there is no damage, debris build up or any potential to cause the SPEL StormSack to operate inefficiently.



5. Material Disposal

Collected materials can be potentially harmful to humans and the environment.

Once all captured material from the SPEL Stormsack has been removed, it must be taken off site and disposed of at a transfer station or a similar approved disposal site.

6. SPEL StormSack Repairs

Depending on the extent of the damage to the SPEL StormSack unit, it can usually be repaired.

Small tears to the filter bag can be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of filter material onto the filter bag.

If large tears or irreparable damage to the frame and structure are present, it is advisable to replace the components.

All required spare parts can be sourced from SPEL Environmental at a cost to the owner of the SPEL Stormsack.

7. Emergency Procedures

Spills and blockages can be detrimental to the performance of a stormwater management system, potentially damaging the surrounding built infrastructure, waterways and environment.

Spill Procedures

In the event of a spill discharging into a gully pit, all effected sediment must be removed from the filter bags and the filter bags are to be removed and replaced with new filter bags. All additional cleaning as a result of the spill should also be carried out in accordance with the normal operation procedures.

Blockages

In the unlikely event of surface flooding around a gully pit which has a SPEL StormSack fitted, the following steps should be carried out:

- A. Check the overflow bypass.
- B. If overflow is clear and surface flooding still exists remove the SPEL StormSack and check the outlet pipe for blockages. Removal of the SPEL StormSack can be difficult if clogged with sediment and holding water.
- C. If the filter is clogged brush the side walls to dislodge particles trapped at the interface allowing water to flow through the filter.
- D. If the outlet pipe is blocked, it is likely that a gully sucker truck will be required to unblock it. Litter can be removed from the SPEL StormSack using the gully sucker truck before the SPEL StormSack is removed. If a gully sucker truck is not available and the SPEL StormSacks need to be removed by hand follow the below steps.
 - i. Remove excess debris by hand or brush the side of the filter bag
 - ii. Remove entire SPEL Stormsack by taking hold of the inside of the frame.
 - iii. Unblock the outlet pipe



HEAD OFFICE

PO Box 6144
Silverwater NSW 1811

100 Silverwater Rd
Silverwater NSW 2128

Phone: +61 2 8705 0255

Fax: +61 2 8014 8699



DESIGN OFFICES

New South Wales	61 2 8705 0255
Canberra	61 2 6128 1000
Queensland	61 7 3271 6960
Victoria & Tasmania	61 3 5274 1336
South Australia	61 8 8275 8000
West Australia	61 8 9350 1000
Northern Territory	61 2 8705 0255
New Zealand	64 9 276 9045

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SPELFilter

Operation & Maintenance Manual

www.spel.com.au

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Introduction

Understanding how to correctly and safely maintain the SPELFilter is essential for the preservation of the filter's condition and its operational effectiveness. The SPELFilter is a highly engineered stormwater filtration device designed to remove sediments, heavy metals, nitrogen and phosphorus from stormwater runoff.

The filters can be housed in either a concrete or fibreglass structure that evenly distributes the flow between cartridges. Flow through the filter cartridges is gravity driven and self-regulating, which makes the SPELFilter system a low maintenance, high performance stormwater treatment device.

This manual will provide the necessary steps that are to be taken to correctly and efficiently ensure the life of the SPEL Filter product.



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3

Specifications/Features

SPEL Environmental manufactures two height cartridges for varying site constraints as shown below. Each cartridge is designed to treat stormwater at a flow rate of 1.47 Litres per second and 2.83 Litres per second for the half-height cartridge (model No. SF.14-EMC) and full-height cartridge (model No. SF.29-EMC) respectively.

SPEL Filter - SF.14-EMC



SPEL Filter - SF.29-EMC



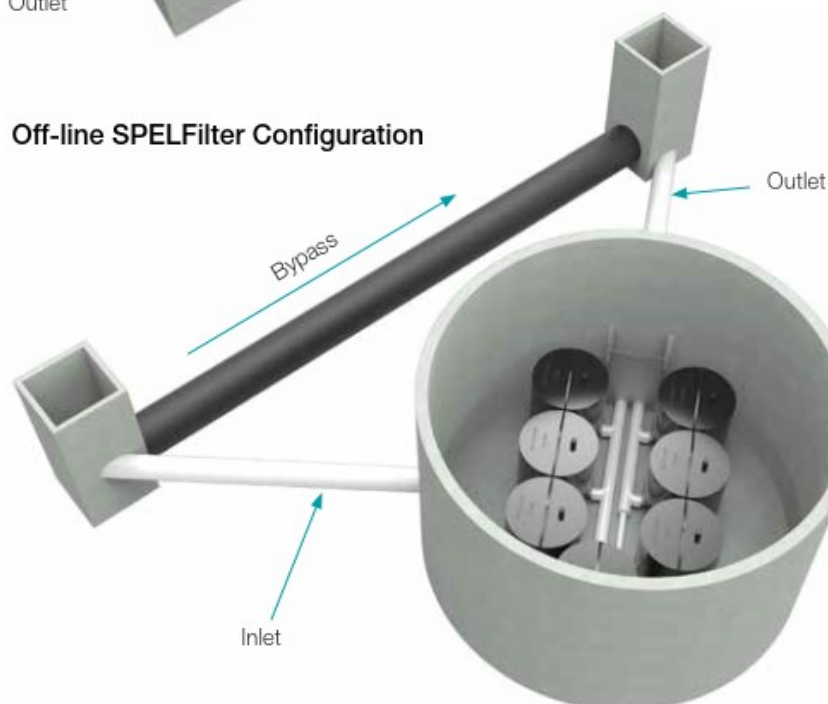
System Configuration

SPELFilter cartridges are installed in concrete or fibreglass tanks commonly referred to as 'vaults'. The vault selection and configuration are based on site characteristics and/or constraints; computational stormwater quality modelling; and selected SPELFilter models. Typical SPELFilter system configurations are shown below.

In-line SPELFilter Configuration



Off-line SPELFilter Configuration



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Health and Safety

A. Personal Health & Safety

When carrying out the necessary installation operations of the SPEL Filter all contractors and staff personnel must comply with all current workplace health and safety legislation.

The below measures should be adhered to as practically as possible.

- Comply with all applicable laws, regulations and standards
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

B. Personal Protective

Equipment / Safety equipment

When carrying out the necessary installation operations of the SPEL Filter, wearing the appropriate personal protective equipment and utilising the adequate safety equipment is vital to reducing potential hazards.

Personal protective equipment / safety equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots
- Ear muffs
- Hard hat/s
- Sunscreen

C. Confined space

In the event access is required into the vault, confined space permits will be required which is not covered in this manual. Typical equipment required for confined space entry include:

- Harness
- Gas detector
- Tripod
- Spotter

D. Traffic Control

It is not uncommon for SPEL Filter cartridges to be installed underneath trafficable areas. Minimum traffic control measures will need to be put in place in accordance with traffic control plans set out by respective local and state road authorities.



Vaults are to be treated as confined space. Entry by permit only.



Monitor weather conditions prior to operation maintenance. Do not enter a vault during an episode of heavy rain as this can create a risk of drowning.



Maintenance frequency

The SPELFilter's design allows for a greater life span when frequently maintenance. Maintenance is broken up into three categories which include: standard inspection; general cleaning; and cartridge replacement.

Standard inspection

Standard inspections are conducted at regular four-month intervals. At this time, an approved trained maintenance officer or SPEL representative shall undertake all measures outlined in Maintenance Procedure, Standard Inspection.

General Cleaning

At the end of each standard inspection, trigger measures will identify if general cleaning is required. General cleaning will need to be executed immediate during standard inspections if the follow triggers are satisfied:

- Build-up of debris/pollutants within the vault greater than 150mm;
- Accumulation of debris/pollutants on the outlet chamber of the SPELFilter vault;
- After large storm events, tidal or flooding impacts at the request of the owner;

Cartridge Replacement

Stormwater treatment is dependent on the effectiveness of the SPELFilter cartridge system. As the SPELFilter ages, pollutants will inundate the cartridge and ultimately reduce the treatment flow rate. At this point, a SPELFilter flow test apparatus will be utilities to determine if replacement cartridges are required.

Based on the [site] concept modelling (MUSIC) and previous industry experience, we estimate the life of the SPELFilter to be between 6 - 8 years. As a minimum requirement, each SPELFilter cartridge should be replaced within 10 years.

The life cycle of the SPELFilter can be impacted if standard inspections and general maintenance is not undertaken in accordance with this operation and maintenance manual. Other factors that will affect the above life cycle of the SPELFilter include:

- Installation of cartridge system during construction phase and impacted by construction sediment loads;
- Neglecting to install pre-treatment using an industry approved GPT or a surface inlet pit trash bag such as the SPEL StormSack.
- Unforeseen environmental hazards affecting the SPELFilter functionality.

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Maintenance Procedure

Stormwater pollutants captured and retained by the SPELFilter system need to be periodically removed to ensure environmental values are upheld. All associated maintenance works is heavily dependent on the site's operational activities and generated stormwater pollutants. To ensure the longevity of the installed SPELFilter treatment system, it is imperative that the procedures detailed in this manual are followed and all appropriate measures are actioned immediately.

Standard inspection

The standard inspection requires personal experience of SPEL products to visual inspection the vault and filter conditions.

Confined space requirements may not be required if a full inspection and assessment of each SPELFilter can be achieved at surface level without being deemed a confined space entry.

The standard inspection requires personal experience of SPEL products to visual inspection the vault and filter conditions.

Confined space requirements may not be required if a full inspection and assessment of each SPELFilter can be achieved at surface level without being deemed a confined space entry.

Site Inspection Procedures

1. Implement Pre-start safety measures.

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected. Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

2. Set-up Gantry Tri-pod above Manhole.

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the SPEL Filters. Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid.

Once you have sent up the Gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

4. Conduct Gas tests. (If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely.

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space

6. SPELFilter system assessment.

Perform a review of the SPELFilter system using the SPELFilter assessment report/checklist. Sign off and forward a copy of the report to property manager and SPEL representative.

7. Reinstate SPELFilter system and disposal.

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

8. Sign off and forward a copy of the report to property manager and SPEL representative.

Maintenance Procedure (cont.)

General Cleaning

Vacuum out of Filter tank, removal and disposal of pollutants

At the completion of a standard inspection, general cleaning may be deemed necessary immediately or scheduled for a future date. Steps undertaken for general cleaning should be in general accordance with the procedure outlined below but not limited.

1. Implement Pre-start safety measures.

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected. Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

2. Set-up Gantry Tri-pod above Manhole.

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the SPEL Filters. Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid.

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4. Conduct Gas tests.

(If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely.

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space

6. SPELFilter system assessment.

Perform a review of the SPELFilter system using the SPELFilter assessment report/checklist.

7. Pollutant removal from tank.

Perform clean-up using a licenced vacuum truck contractor or wet/dry vacuum, depending on level of sediment built up and/or tank size.

8. Reinstate SPELFilter system and disposal.

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

9. Sign off and forward a copy of the report to property manager and SPEL representative.

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Maintenance Procedure (cont.)

Cartridge Replacement

SPEL Filter replacement procedures may vary depending on the configuration of the SPEL Filters, the type of vault and engineers specs. Replacement instructions for manhole SPEL Filter systems and precast vault SPEL Filter systems are contained in this section.

Custom SPEL Filter systems may have particular replacement issues that will be addressed during the design.

At the completion of a standard inspection, SPEL Filter replacement may be deemed necessary immediately or scheduled for a future date. Steps undertaken for cartridge replacement should be in general accordance with the procedure outlined below but not limited.



1. Implement Pre-start safety measures.

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected. Area in which work is to be carried out must be clean, safe and hazard free.

2. Set-up Gantry Tri-pod above Manhole.

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the SPEL Filters. Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid.

Once you have sent up the Gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

4. Conduct Gas tests. (If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely.

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space procedures are followed.

6. Remove exhausted cartridges.

Disconnect all internal pipe work from inside the vault. Un-bolt anti-floatation measures and remove cartridges from the vault using Gantry Tri-pod method.

7. Pollutant removal.

Using a wet/dry vacuum or sucker truck, suck out all the residual pollutant from the vault.

8. Install pipework and SPEL Filters.

Please refer to the below standard install diagrams for the SPEL Filters. Then refer to your site specific drawings, as site requirements may require something different to the standard layout. Lower filters into tank, position into place, connect filter outlet pipework with the supplied fittings.

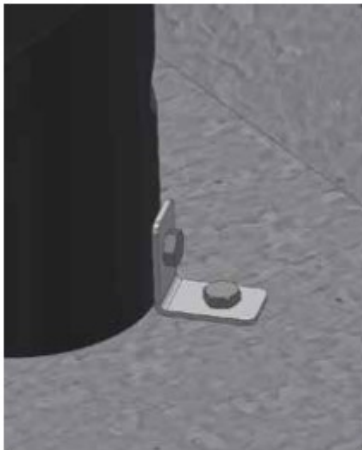
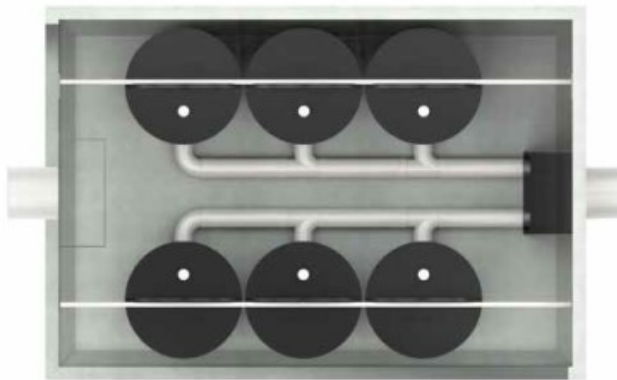
9. Install anti-floatation system.

Please refer refer to the detailed drawings showing how the Anti – Floatation (Anchor) bars are to be installed.

10. Sign off and forward a copy of the report to property manager and SPEL representative.

Cartridge Replacement (cont.)

**Standard install with PVC
Outlet pipework and anti
floatation bars**



Alternative anti-floatation
bolt down system



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Site Exit and Clean Up

At the end of the scheduled maintenance, approved contractors or SPEL maintenance crew are required to reinstate the site to pre-existing conditions. Steps included but limited to are:

- Ensure all access covers are securely inserted back into their frames;
- Remove and dispose collected pollutants from the site in accordance with local regulator authorities;
- Retrieve all traffic control measures and maintenance tools; and
- Return all exhausted and/or damaged SPEL products to SPEL Environmental to begin recycling program.



APPENDIX C MODEL INFORMATION



1 Source nodes
 2 Location, SHED - 1, BUNKERS- 1, BUNKERS- 2, CONTRETE, Ground
 3 ID, 1, 2, 3, 4, 5
 4 Node
 Type, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode
 5 Zoning Surface Type, Roof, Roof, Roof, Sealedroad, Revegetatedland
 6 Total Area (ha), 0.036, 0.003, 0.014, 0.018, 0.437
 7 Area Impervious (ha), 0.036, 0.003, 0.014, 0.018, 0
 8 Area Pervious (ha), 0, 0, 0, 0, 0.437
 9 Field Capacity (mm), 80, 80, 80, 80, 80
 10 Pervious Area Infiltration Capacity coefficient - a, 243, 243, 243, 243, 243
 11 Pervious Area Infiltration Capacity exponent - b, 0.6, 0.6, 0.6, 0.6, 0.6
 12 Impervious Area Rainfall Threshold (mm/day), 1, 1, 1, 1, 1
 13 Pervious Area Soil Storage Capacity (mm), 18, 18, 18, 18, 18
 14 Pervious Area Soil Initial Storage (% of Capacity), 10, 10, 10, 10, 10
 15 Groundwater Initial Depth (mm), 50, 50, 50, 50, 50
 16 Groundwater Daily Recharge Rate (%), 0, 0, 0, 0, 0
 17 Groundwater Daily Baseflow Rate (%), 31, 31, 31, 31, 31
 18 Groundwater Daily Deep Seepage Rate (%), 0, 0, 0, 0, 0
 19 Stormflow Total Suspended Solids Mean (log mg/L), 1.92, 1.92, 1.92, 1.92, 1.92
 20 Stormflow Total Suspended Solids Standard Deviation (log
 mg/L), 0.44, 0.44, 0.44, 0.44, 0.44
 21 Stormflow Total Suspended Solids Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 22 Stormflow Total Suspended Solids Serial Correlation, 0, 0, 0, 0, 0
 23 Stormflow Total Phosphorus Mean (log mg/L), -0.59, -0.59, -0.59, -0.59, -0.59
 24 Stormflow Total Phosphorus Standard Deviation (log mg/L), 0.36, 0.36, 0.36, 0.36, 0.36
 25 Stormflow Total Phosphorus Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 26 Stormflow Total Phosphorus Serial Correlation, 0, 0, 0, 0, 0
 27 Stormflow Total Nitrogen Mean (log mg/L), 0.25, 0.25, 0.25, 0.25, 0.25
 28 Stormflow Total Nitrogen Standard Deviation (log mg/L), 0.32, 0.32, 0.32, 0.32, 0.32
 29 Stormflow Total Nitrogen Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 30 Stormflow Total Nitrogen Serial Correlation, 0, 0, 0, 0, 0
 31 Baseflow Total Suspended Solids Mean (log mg/L), 0.78, 0.78, 0.78, 0.78, 0.78
 32 Baseflow Total Suspended Solids Standard Deviation (log mg/L), 0.45, 0.45, 0.45, 0.45, 0.45
 33 Baseflow Total Suspended Solids Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 34 Baseflow Total Suspended Solids Serial Correlation, 0, 0, 0, 0, 0
 35 Baseflow Total Phosphorus Mean (log mg/L), -1.11, -1.11, -1.11, -1.11, -1.11
 36 Baseflow Total Phosphorus Standard Deviation (log mg/L), 0.48, 0.48, 0.48, 0.48, 0.48
 37 Baseflow Total Phosphorus Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 38 Baseflow Total Phosphorus Serial Correlation, 0, 0, 0, 0, 0
 39 Baseflow Total Nitrogen Mean (log mg/L), 0.14, 0.14, 0.14, 0.14, 0.14
 40 Baseflow Total Nitrogen Standard Deviation (log mg/L), 0.2, 0.2, 0.2, 0.2, 0.2
 41 Baseflow Total Nitrogen Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 42 Baseflow Total Nitrogen Serial Correlation, 0, 0, 0, 0, 0
 43 Flow based constituent generation - enabled, Off, Off, Off, Off, Off
 44 Flow based constituent generation - flow file, , , , ,
 45 Flow based constituent generation - base flow column, , , , ,
 46 Flow based constituent generation - pervious flow column, , , , ,
 47 Flow based constituent generation - impervious flow column, , , , ,
 48 Flow based constituent generation - unit, , , , ,
 49 OUT - Mean Annual Flow (ML/yr), 0.536, 44.7E-3, 0.209, 0.268, 4.23
 50 OUT - TSS Mean Annual Load (kg/yr), 73.5, 6.22, 28.7, 37.2, 586
 51 OUT - TP Mean Annual Load (kg/yr), 0.193, 16.1E-3, 75.6E-3, 97.2E-3, 1.52
 52 OUT - TN Mean Annual Load (kg/yr), 1.25, 0.104, 0.484, 0.629, 9.84
 53 OUT - Gross Pollutant Mean Annual Load (kg/yr), 10.2, 0.853, 3.98, 5.12, 0.00
 54 Rain In (ML/yr), 0.57791, 0.0481592, 0.22474, 0.288955, 7.01516
 55 ET Loss (ML/yr), 0.0414888, 0.0034573, 0.0161346, 0.0207444, 2.787
 56 Deep Seepage Loss (ML/yr), 0, 0, 0, 0, 0
 57 Baseflow Out (ML/yr), 0, 0, 0, 0, 0
 58 Imp. Stormflow Out (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 0
 59 Perv. Stormflow Out (ML/yr), 0, 0, 0, 0, 4.22858
 60 Total Stormflow Out (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 4.22858
 61 Total Outflow (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 4.22858
 62 Change in Soil Storage (ML/yr), 0, 0, 0, 0, -0.000367674
 63 TSS Baseflow Out (kg/yr), 0, 0, 0, 0, 0
 64 TSS Total Stormflow Out (kg/yr), 73.5406, 6.21533, 28.6523, 37.1945, 585.942
 65 TSS Total Outflow (kg/yr), 73.5406, 6.21533, 28.6523, 37.1945, 585.942


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66 TP Baseflow Out (kg/yr),0,0,0,0,0
67 TP Total Stormflow Out (kg/yr),0.192748,0.016086,0.0756485,0.0972226,1.52396
68 TP Total Outflow (kg/yr),0.192748,0.016086,0.0756485,0.0972226,1.52396
69 TN Baseflow Out (kg/yr),0,0,0,0,0
70 TN Total Stormflow Out (kg/yr),1.24699,0.104336,0.484394,0.629223,9.83872
71 TN Total Outflow (kg/yr),1.24699,0.104336,0.484394,0.629223,9.83872
72 GP Total Outflow (kg/yr),10.2327,0.852723,3.97937,5.11633,0
73
74 No Imported Data Source nodes
75
76 USTM treatment nodes
77 Location,SPEL vault (8.0/0.85) - QUT Final
78 ID,7
79 Node Type,DetentionBasinNode
80 Lo-flow bypass rate (cum/sec),0
81 Hi-flow bypass rate (cum/sec),100
82 Inlet pond volume,0
83 Area (sqm),8
84 Initial Volume (m^3),
85 Extended detention depth (m),0.85
86 Number of Rainwater tanks,
87 Permanent Pool Volume (cubic metres),0
88 Proportion vegetated,0
89 Equivalent Pipe Diameter (mm),90
90 Overflow weir width (m),5
91 Notional Detention Time (hrs),0.109
92 Orifice Discharge Coefficient,0.6
93 Weir Coefficient,1.7
94 Number of CSTR Cells,1
95 Total Suspended Solids - k (m/yr),8000
96 Total Suspended Solids - C* (mg/L),20
97 Total Suspended Solids - C** (mg/L),20
98 Total Phosphorus - k (m/yr),6000
99 Total Phosphorus - C* (mg/L),0.13
100 Total Phosphorus - C** (mg/L),0.13
101 Total Nitrogen - k (m/yr),500
102 Total Nitrogen - C* (mg/L),1.4
103 Total Nitrogen - C** (mg/L),1.4
104 Threshold Hydraulic Loading for C** (m/yr),3500
105 Horizontal Flow Coefficient,
106 Reuse Enabled,Off
107 Max drawdown height (m),
108 Annual Demand Enabled,Off
109 Annual Demand Value (ML/year),
110 Annual Demand Distribution,
111 Annual Demand Monthly Distribution: Jan,
112 Annual Demand Monthly Distribution: Feb,
113 Annual Demand Monthly Distribution: Mar,
114 Annual Demand Monthly Distribution: Apr,
115 Annual Demand Monthly Distribution: May,
116 Annual Demand Monthly Distribution: Jun,
117 Annual Demand Monthly Distribution: Jul,
118 Annual Demand Monthly Distribution: Aug,
119 Annual Demand Monthly Distribution: Sep,
120 Annual Demand Monthly Distribution: Oct,
121 Annual Demand Monthly Distribution: Nov,
122 Annual Demand Monthly Distribution: Dec,
123 Daily Demand Enabled,Off
124 Daily Demand Value (ML/day),
125 Custom Demand Enabled,Off
126 Custom Demand Time Series File,
127 Custom Demand Time Series Units,
128 Filter area (sqm),
129 Filter perimeter (m),
130 Filter depth (m),
131 Filter Median Particle Diameter (mm),
132 Saturated Hydraulic Conductivity (mm/hr),
133 Infiltration Media Porosity,
134 Length (m),
135 Bed slope,
136 Base Width (m),
137 Top width (m),
138 Vegetation height (m),

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139 Vegetation Type,
 140 Total Nitrogen Content in Filter (mg/kg),
 141 Orthophosphate Content in Filter (mg/kg),
 142 Is Base Lined?,
 143 Is Underdrain Present?,
 144 Is Submerged Zone Present?,
 145 Submerged Zone Depth (m),
 146 B for Media Soil Texture,-9999
 147 Proportion of upstream impervious area treated,
 148 Exfiltration Rate (mm/hr),0
 149 Evaporative Loss as % of PET,0
 150 Depth in metres below the drain pipe,
 151 TSS A Coefficient,
 152 TSS B Coefficient,
 153 TP A Coefficient,
 154 TP B Coefficient,
 155 TN A Coefficient,
 156 TN B Coefficient,
 157 Sfc,
 158 S*,
 159 Sw,
 160 Sh,
 161 Emax (m/day),
 162 Ew (m/day),
 163 IN - Mean Annual Flow (ML/yr),1.06
 164 IN - TSS Mean Annual Load (kg/yr),123
 165 IN - TP Mean Annual Load (kg/yr),0.354
 166 IN - TN Mean Annual Load (kg/yr),2.18
 167 IN - Gross Pollutant Mean Annual Load (kg/yr),15.1
 168 OUT - Mean Annual Flow (ML/yr),1.06
 169 OUT - TSS Mean Annual Load (kg/yr),54.6
 170 OUT - TP Mean Annual Load (kg/yr),0.223
 171 OUT - TN Mean Annual Load (kg/yr),2.07
 172 OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
 173 Flow In (ML/yr),1.05788
 174 ET Loss (ML/yr),0
 175 Infiltration Loss (ML/yr),0
 176 Low Flow Bypass Out (ML/yr),0
 177 High Flow Bypass Out (ML/yr),0
 178 Orifice / Filter Out (ML/yr),1.05552
 179 Weir Out (ML/yr),0.0022478
 180 Transfer Function Out (ML/yr),0
 181 Reuse Supplied (ML/yr),0
 182 Reuse Requested (ML/yr),0
 183 % Reuse Demand Met,0
 184 % Load Reduction,0.0108934
 185 TSS Flow In (kg/yr),122.914
 186 TSS ET Loss (kg/yr),0
 187 TSS Infiltration Loss (kg/yr),0
 188 TSS Low Flow Bypass Out (kg/yr),0
 189 TSS High Flow Bypass Out (kg/yr),0
 190 TSS Orifice / Filter Out (kg/yr),54.3037
 191 TSS Weir Out (kg/yr),0.251802
 192 TSS Transfer Function Out (kg/yr),0
 193 TSS Reuse Supplied (kg/yr),0
 194 TSS Reuse Requested (kg/yr),0
 195 TSS % Reuse Demand Met,0
 196 TSS % Load Reduction,55.615
 197 TP Flow In (kg/yr),0.354483
 198 TP ET Loss (kg/yr),0
 199 TP Infiltration Loss (kg/yr),0
 200 TP Low Flow Bypass Out (kg/yr),0
 201 TP High Flow Bypass Out (kg/yr),0
 202 TP Orifice / Filter Out (kg/yr),0.222207
 203 TP Weir Out (kg/yr),0.000762983
 204 TP Transfer Function Out (kg/yr),0
 205 TP Reuse Supplied (kg/yr),0
 206 TP Reuse Requested (kg/yr),0
 207 TP % Reuse Demand Met,0
 208 TP % Load Reduction,37.1
 209 TN Flow In (kg/yr),2.1818
 210 TN ET Loss (kg/yr),0
 211 TN Infiltration Loss (kg/yr),0

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212 TN Low Flow Bypass Out (kg/yr),0
213 TN High Flow Bypass Out (kg/yr),0
214 TN Orifice / Filter Out (kg/yr),2.06809
215 TN Weir Out (kg/yr),0.00456202
216 TN Transfer Function Out (kg/yr),0
217 TN Reuse Supplied (kg/yr),0
218 TN Reuse Requested (kg/yr),0
219 TN % Reuse Demand Met,0
220 TN % Load Reduction,5.00299
221 GP Flow In (kg/yr),15.0647
222 GP ET Loss (kg/yr),0
223 GP Infiltration Loss (kg/yr),0
224 GP Low Flow Bypass Out (kg/yr),0
225 GP High Flow Bypass Out (kg/yr),0
226 GP Orifice / Filter Out (kg/yr),0
227 GP Weir Out (kg/yr),0
228 GP Transfer Function Out (kg/yr),0
229 GP Reuse Supplied (kg/yr),0
230 GP Reuse Requested (kg/yr),0
231 GP % Reuse Demand Met,0
232 GP % Load Reduction,100
233 PET Scaling Factor,
234
235 Generic treatment nodes
236 Location,SPEL Stormsacks (1) - QUT Final,4/SPELFilter (EMC 45) - QUT Final
237 ID,6,8
238 Node Type,GPTNode,GenericNode
239 Lo-flow bypass rate (cum/sec),0,0
240 Hi-flow bypass rate (cum/sec),0.011,0.01132
241 Flow Transfer Function
242 Input (cum/sec),0,0
243 Output (cum/sec),0,0
244 Input (cum/sec),10,10
245 Output (cum/sec),10,10
246 Input (cum/sec), ,
247 Output (cum/sec), ,
248 Input (cum/sec), ,
249 Output (cum/sec), ,
250 Input (cum/sec), ,
251 Output (cum/sec), ,
252 Input (cum/sec), ,
253 Output (cum/sec), ,
254 Input (cum/sec), ,
255 Output (cum/sec), ,
256 Input (cum/sec), ,
257 Output (cum/sec), ,
258 Input (cum/sec), ,
259 Output (cum/sec), ,
260 Input (cum/sec), ,
261 Output (cum/sec), ,
262 Gross Pollutant Transfer Function
263 Enabled,True,True
264 Input (kg/ML),0,0
265 Output (kg/ML),0,0
266 Input (kg/ML),15,15
267 Output (kg/ML),0,0
268 Input (kg/ML), ,
269 Output (kg/ML), ,
270 Input (kg/ML), ,
271 Output (kg/ML), ,
272 Input (kg/ML), ,
273 Output (kg/ML), ,
274 Input (kg/ML), ,
275 Output (kg/ML), ,
276 Input (kg/ML), ,
277 Output (kg/ML), ,
278 Input (kg/ML), ,
279 Output (kg/ML), ,
280 Input (kg/ML), ,
281 Output (kg/ML), ,
282 Input (kg/ML), ,
283 Output (kg/ML), ,
284 Total Nitrogen Transfer Function

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285 Enabled,True,True
286 Input (mg/L),0,0
287 Output (mg/L),0,0
288 Input (mg/L),100,100
289 Output (mg/L),55,58
290 Input (mg/L), ,
291 Output (mg/L), ,
292 Input (mg/L), ,
293 Output (mg/L), ,
294 Input (mg/L), ,
295 Output (mg/L), ,
296 Input (mg/L), ,
297 Output (mg/L), ,
298 Input (mg/L), ,
299 Output (mg/L), ,
300 Input (mg/L), ,
301 Output (mg/L), ,
302 Input (mg/L), ,
303 Output (mg/L), ,
304 Input (mg/L), ,
305 Output (mg/L), ,
306 Total Phosphorus Transfer Function
307 Enabled,True,True
308 Input (mg/L),0,0
309 Output (mg/L),0,0
310 Input (mg/L),100,100
311 Output (mg/L),72,41
312 Input (mg/L), ,
313 Output (mg/L), ,
314 Input (mg/L), ,
315 Output (mg/L), ,
316 Input (mg/L), ,
317 Output (mg/L), ,
318 Input (mg/L), ,
319 Output (mg/L), ,
320 Input (mg/L), ,
321 Output (mg/L), ,
322 Input (mg/L), ,
323 Output (mg/L), ,
324 Input (mg/L), ,
325 Output (mg/L), ,
326 Input (mg/L), ,
327 Output (mg/L), ,
328 Total Suspended Solids Transfer Function
329 Enabled,True,True
330 Input (mg/L),0,0
331 Output (mg/L),0,0
332 Input (mg/L),100,100
333 Output (mg/L),39,22
334 Input (mg/L), ,
335 Output (mg/L), ,
336 Input (mg/L), ,
337 Output (mg/L), ,
338 Input (mg/L), ,
339 Output (mg/L), ,
340 Input (mg/L), ,
341 Output (mg/L), ,
342 Input (mg/L), ,
343 Output (mg/L), ,
344 Input (mg/L), ,
345 Output (mg/L), ,
346 Input (mg/L), ,
347 Output (mg/L), ,
348 Input (mg/L), ,
349 Output (mg/L), ,
350 TSS Flow based Efficiency Enabled,Off,Off
351 TSS Flow based Efficiency, ,
352 TP Flow based Efficiency Enabled,Off,Off
353 TP Flow based Efficiency, ,
354 TN Flow based Efficiency Enabled,Off,Off
355 TN Flow based Efficiency, ,
356 GP Flow based Efficiency Enabled,Off,Off
357 GP Flow based Efficiency, ,

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358 IN - Mean Annual Flow (ML/yr),0.268,1.06
359 IN - TSS Mean Annual Load (kg/yr),37.2,54.6
360 IN - TP Mean Annual Load (kg/yr),97.2E-3,0.223
361 IN - TN Mean Annual Load (kg/yr),0.629,2.07
362 IN - Gross Pollutant Mean Annual Load (kg/yr),5.12,0.00
363 OUT - Mean Annual Flow (ML/yr),0.268,1.06
364 OUT - TSS Mean Annual Load (kg/yr),14.5,12.7
365 OUT - TP Mean Annual Load (kg/yr),70.0E-3,93.0E-3
366 OUT - TN Mean Annual Load (kg/yr),0.346,1.21
367 OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
368 Flow In (ML/yr),0.268245,1.05777
369 ET Loss (ML/yr),0,0
370 Infiltration Loss (ML/yr),0,0
371 Low Flow Bypass Out (ML/yr),0,0
372 High Flow Bypass Out (ML/yr),0,0.0083885
373 Orifice / Filter Out (ML/yr),0,0
374 Weir Out (ML/yr),0,0
375 Transfer Function Out (ML/yr),0.268245,1.04939
376 Reuse Supplied (ML/yr),0,0
377 Reuse Requested (ML/yr),0,0
378 % Reuse Demand Met,0,0
379 % Load Reduction,0,-0.000234291
380 TSS Flow In (kg/yr),37.1866,54.5337
381 TSS ET Loss (kg/yr),0,0
382 TSS Infiltration Loss (kg/yr),0,0
383 TSS Low Flow Bypass Out (kg/yr),0,0
384 TSS High Flow Bypass Out (kg/yr),0,0.861286
385 TSS Orifice / Filter Out (kg/yr),0,0
386 TSS Weir Out (kg/yr),0,0
387 TSS Transfer Function Out (kg/yr),14.5025,11.8082
388 TSS Reuse Supplied (kg/yr),0,0
389 TSS Reuse Requested (kg/yr),0,0
390 TSS % Reuse Demand Met,0,0
391 TSS % Load Reduction,61.0007,76.7676
392 TP Flow In (kg/yr),0.0972001,0.222912
393 TP ET Loss (kg/yr),0,0
394 TP Infiltration Loss (kg/yr),0,0
395 TP Low Flow Bypass Out (kg/yr),0,0
396 TP High Flow Bypass Out (kg/yr),0,0.00269004
397 TP Orifice / Filter Out (kg/yr),0,0
398 TP Weir Out (kg/yr),0,0
399 TP Transfer Function Out (kg/yr),0.0699863,0.090264
400 TP Reuse Supplied (kg/yr),0,0
401 TP Reuse Requested (kg/yr),0,0
402 TP % Reuse Demand Met,0,0
403 TP % Load Reduction,27.9977,58.3001
404 TN Flow In (kg/yr),0.629102,2.07248
405 TN ET Loss (kg/yr),0,0
406 TN Infiltration Loss (kg/yr),0,0
407 TN Low Flow Bypass Out (kg/yr),0,0
408 TN High Flow Bypass Out (kg/yr),0,0.0171199
409 TN Orifice / Filter Out (kg/yr),0,0
410 TN Weir Out (kg/yr),0,0
411 TN Transfer Function Out (kg/yr),0.346015,1.19167
412 TN Reuse Supplied (kg/yr),0,0
413 TN Reuse Requested (kg/yr),0,0
414 TN % Reuse Demand Met,0,0
415 TN % Load Reduction,44.9985,41.6744
416 GP Flow In (kg/yr),5.11635,0
417 GP ET Loss (kg/yr),0,0
418 GP Infiltration Loss (kg/yr),0,0
419 GP Low Flow Bypass Out (kg/yr),0,0
420 GP High Flow Bypass Out (kg/yr),0,0
421 GP Orifice / Filter Out (kg/yr),0,0
422 GP Weir Out (kg/yr),0,0
423 GP Transfer Function Out (kg/yr),0,0
424 GP Reuse Supplied (kg/yr),0,0
425 GP Reuse Requested (kg/yr),0,0
426 GP % Reuse Demand Met,0,0
427 GP % Load Reduction,100,100
428
429 Other nodes
430 Location,Receiving Node

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431 ID,9
432 Node Type,ReceivingNode
433 IN - Mean Annual Flow (ML/yr),1.06
434 IN - TSS Mean Annual Load (kg/yr),12.7
435 IN - TP Mean Annual Load (kg/yr),93.0E-3
436 IN - TN Mean Annual Load (kg/yr),1.21
437 IN - Gross Pollutant Mean Annual Load (kg/yr),0.00
438 OUT - Mean Annual Flow (ML/yr),1.06
439 OUT - TSS Mean Annual Load (kg/yr),12.7
440 OUT - TP Mean Annual Load (kg/yr),93.0E-3
441 OUT - TN Mean Annual Load (kg/yr),1.21
442 OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
443 % Load Reduction,2.68E-3
444 TSS % Load Reduction,91.3
445 TN % Load Reduction,50.9
446 TP % Load Reduction,75.6
447 GP % Load Reduction,100
448
449 Links
450 Location,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage
Link,Drainage Link,Drainage Link
451 Source node ID,4,6,7,1,3,2,8
452 Target node ID,6,7,8,7,7,7,9
453 Muskingum-Cunge Routing,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not
Routed,Not Routed
454 Muskingum K, , , , , , ,
455 Muskingum theta, , , , , , ,
456 IN - Mean Annual Flow (ML/yr),0.268,0.268,1.06,0.536,0.209,44.7E-3,1.06
457 IN - TSS Mean Annual Load (kg/yr),37.2,14.5,54.6,73.5,28.7,6.22,12.7
458 IN - TP Mean Annual Load (kg/yr),97.2E-3,70.0E-3,0.223,0.193,75.6E-3,16.1E-3,93.0E-3
459 IN - TN Mean Annual Load (kg/yr),0.629,0.346,2.07,1.25,0.484,0.104,1.21
460 IN - Gross Pollutant Mean Annual Load (kg/yr),5.12,0.00,0.00,10.2,3.98,0.853,0.00
461 OUT - Mean Annual Flow (ML/yr),0.268,0.268,1.06,0.536,0.209,44.7E-3,1.06
462 OUT - TSS Mean Annual Load (kg/yr),37.2,14.5,54.6,73.5,28.7,6.22,12.7
463 OUT - TP Mean Annual Load (kg/yr),97.2E-3,70.0E-3,0.223,0.193,75.6E-3,16.1E-3,93.0E-3
464 OUT - TN Mean Annual Load (kg/yr),0.629,0.346,2.07,1.25,0.484,0.104,1.21
465 OUT - Gross Pollutant Mean Annual Load (kg/yr),5.12,0.00,0.00,10.2,3.98,0.853,0.00
466
467 Catchment Details
468 Catchment Name,Douglas Option2
469 Timestep,6 Minutes
470 Start Date,1/01/1917
471 End Date,31/12/1962 11:54:00 PM
472 Rainfall Station, 31055 MOSSMAN
473 ET Station,User-defined monthly PET
474 Mean Annual Rainfall (mm), 1608
475 Mean Annual ET (mm), 2291
476

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1 Source nodes
 2 Location, SHED - 1, BUNKERS- 1, BUNKERS- 2, CONTRETE, Ground
 3 ID, 2, 3, 4, 5, 6
 4 Node
 Type, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode, UrbanSourceNode
 5 Zoning Surface Type, Roof, Roof, Roof, Sealedroad, Revegetatedland
 6 Total Area (ha), 0.036, 0.003, 0.014, 0.018, 0.437
 7 Area Impervious (ha), 0.036, 0.003, 0.014, 0.018, 0
 8 Area Pervious (ha), 0, 0, 0, 0, 0.437
 9 Field Capacity (mm), 80, 80, 80, 80, 80
 10 Pervious Area Infiltration Capacity coefficient - a, 243, 243, 243, 243, 243
 11 Pervious Area Infiltration Capacity exponent - b, 0.6, 0.6, 0.6, 0.6, 0.6
 12 Impervious Area Rainfall Threshold (mm/day), 1, 1, 1, 1, 1
 13 Pervious Area Soil Storage Capacity (mm), 18, 18, 18, 18, 18
 14 Pervious Area Soil Initial Storage (% of Capacity), 10, 10, 10, 10, 10
 15 Groundwater Initial Depth (mm), 50, 50, 50, 50, 50
 16 Groundwater Daily Recharge Rate (%), 0, 0, 0, 0, 0
 17 Groundwater Daily Baseflow Rate (%), 31, 31, 31, 31, 31
 18 Groundwater Daily Deep Seepage Rate (%), 0, 0, 0, 0, 0
 19 Stormflow Total Suspended Solids Mean (log mg/L), 1.92, 1.92, 1.92, 1.92, 1.92
 20 Stormflow Total Suspended Solids Standard Deviation (log
 mg/L), 0.44, 0.44, 0.44, 0.44, 0.44
 21 Stormflow Total Suspended Solids Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 22 Stormflow Total Suspended Solids Serial Correlation, 0, 0, 0, 0, 0
 23 Stormflow Total Phosphorus Mean (log mg/L), -0.59, -0.59, -0.59, -0.59, -0.59
 24 Stormflow Total Phosphorus Standard Deviation (log mg/L), 0.36, 0.36, 0.36, 0.36, 0.36
 25 Stormflow Total Phosphorus Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 26 Stormflow Total Phosphorus Serial Correlation, 0, 0, 0, 0, 0
 27 Stormflow Total Nitrogen Mean (log mg/L), 0.25, 0.25, 0.25, 0.25, 0.25
 28 Stormflow Total Nitrogen Standard Deviation (log mg/L), 0.32, 0.32, 0.32, 0.32, 0.32
 29 Stormflow Total Nitrogen Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 30 Stormflow Total Nitrogen Serial Correlation, 0, 0, 0, 0, 0
 31 Baseflow Total Suspended Solids Mean (log mg/L), 0.78, 0.78, 0.78, 0.78, 0.78
 32 Baseflow Total Suspended Solids Standard Deviation (log mg/L), 0.45, 0.45, 0.45, 0.45, 0.45
 33 Baseflow Total Suspended Solids Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 34 Baseflow Total Suspended Solids Serial Correlation, 0, 0, 0, 0, 0
 35 Baseflow Total Phosphorus Mean (log mg/L), -1.11, -1.11, -1.11, -1.11, -1.11
 36 Baseflow Total Phosphorus Standard Deviation (log mg/L), 0.48, 0.48, 0.48, 0.48, 0.48
 37 Baseflow Total Phosphorus Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 38 Baseflow Total Phosphorus Serial Correlation, 0, 0, 0, 0, 0
 39 Baseflow Total Nitrogen Mean (log mg/L), 0.14, 0.14, 0.14, 0.14, 0.14
 40 Baseflow Total Nitrogen Standard Deviation (log mg/L), 0.2, 0.2, 0.2, 0.2, 0.2
 41 Baseflow Total Nitrogen Estimation
 Method, Stochastic, Stochastic, Stochastic, Stochastic, Stochastic
 42 Baseflow Total Nitrogen Serial Correlation, 0, 0, 0, 0, 0
 43 Flow based constituent generation - enabled, Off, Off, Off, Off, Off
 44 Flow based constituent generation - flow file, , , , ,
 45 Flow based constituent generation - base flow column, , , , ,
 46 Flow based constituent generation - pervious flow column, , , , ,
 47 Flow based constituent generation - impervious flow column, , , , ,
 48 Flow based constituent generation - unit, , , , ,
 49 OUT - Mean Annual Flow (ML/yr), 0.536, 44.7E-3, 0.209, 0.268, 4.23
 50 OUT - TSS Mean Annual Load (kg/yr), 74.2, 6.22, 28.4, 37.1, 578
 51 OUT - TP Mean Annual Load (kg/yr), 0.193, 16.0E-3, 75.6E-3, 97.6E-3, 1.53
 52 OUT - TN Mean Annual Load (kg/yr), 1.26, 0.104, 0.488, 0.626, 9.80
 53 OUT - Gross Pollutant Mean Annual Load (kg/yr), 10.2, 0.853, 3.98, 5.12, 0.00
 54 Rain In (ML/yr), 0.57791, 0.0481592, 0.22474, 0.288955, 7.01516
 55 ET Loss (ML/yr), 0.0414888, 0.0034573, 0.0161346, 0.0207444, 2.787
 56 Deep Seepage Loss (ML/yr), 0, 0, 0, 0, 0
 57 Baseflow Out (ML/yr), 0, 0, 0, 0, 0
 58 Imp. Stormflow Out (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 0
 59 Perv. Stormflow Out (ML/yr), 0, 0, 0, 0, 4.22858
 60 Total Stormflow Out (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 4.22858
 61 Total Outflow (ML/yr), 0.536422, 0.0447018, 0.208608, 0.268211, 4.22858
 62 Change in Soil Storage (ML/yr), 0, 0, 0, 0, -0.000367674
 63 TSS Baseflow Out (kg/yr), 0, 0, 0, 0, 0
 64 TSS Total Stormflow Out (kg/yr), 74.1805, 6.21749, 28.4343, 37.1291, 577.807
 65 TSS Total Outflow (kg/yr), 74.1805, 6.21749, 28.4343, 37.1291, 577.807


```

66 TP Baseflow Out (kg/yr),0,0,0,0,0
67 TP Total Stormflow Out (kg/yr),0.193346,0.0160304,0.0755876,0.0976024,1.53035
68 TP Total Outflow (kg/yr),0.193346,0.0160304,0.0755876,0.0976024,1.53035
69 TN Baseflow Out (kg/yr),0,0,0,0,0
70 TN Total Stormflow Out (kg/yr),1.26324,0.103501,0.488027,0.626378,9.80262
71 TN Total Outflow (kg/yr),1.26324,0.103501,0.488027,0.626378,9.80262
72 GP Total Outflow (kg/yr),10.2327,0.852723,3.97937,5.11633,0
73
74 No Imported Data Source nodes
75
76 USTM treatment nodes
77 Location,Bioretenention
78 ID,1
79 Node Type,BioRetentionNodeV4
80 Lo-flow bypass rate (cum/sec),0
81 Hi-flow bypass rate (cum/sec),100
82 Inlet pond volume,
83 Area (sqm),18
84 Initial Volume (m^3),
85 Extended detention depth (m),0.3
86 Number of Rainwater tanks,
87 Permanent Pool Volume (cubic metres),
88 Proportion vegetated,
89 Equivalent Pipe Diameter (mm),
90 Overflow weir width (m),2
91 Notional Detention Time (hrs),
92 Orifice Discharge Coefficient,
93 Weir Coefficient,1.7
94 Number of CSTR Cells,3
95 Total Suspended Solids - k (m/yr),8000
96 Total Suspended Solids - C* (mg/L),20
97 Total Suspended Solids - C** (mg/L),
98 Total Phosphorus - k (m/yr),6000
99 Total Phosphorus - C* (mg/L),0.13
100 Total Phosphorus - C** (mg/L),
101 Total Nitrogen - k (m/yr),500
102 Total Nitrogen - C* (mg/L),1.4
103 Total Nitrogen - C** (mg/L),
104 Threshold Hydraulic Loading for C** (m/yr),
105 Horizontal Flow Coefficient,3
106 Reuse Enabled,Off
107 Max drawdown height (m),
108 Annual Demand Enabled,Off
109 Annual Demand Value (ML/year),
110 Annual Demand Distribution,
111 Annual Demand Monthly Distribution: Jan,
112 Annual Demand Monthly Distribution: Feb,
113 Annual Demand Monthly Distribution: Mar,
114 Annual Demand Monthly Distribution: Apr,
115 Annual Demand Monthly Distribution: May,
116 Annual Demand Monthly Distribution: Jun,
117 Annual Demand Monthly Distribution: Jul,
118 Annual Demand Monthly Distribution: Aug,
119 Annual Demand Monthly Distribution: Sep,
120 Annual Demand Monthly Distribution: Oct,
121 Annual Demand Monthly Distribution: Nov,
122 Annual Demand Monthly Distribution: Dec,
123 Daily Demand Enabled,Off
124 Daily Demand Value (ML/day),
125 Custom Demand Enabled,Off
126 Custom Demand Time Series File,
127 Custom Demand Time Series Units,
128 Filter area (sqm),18
129 Filter perimeter (m),30
130 Filter depth (m),0.4
131 Filter Median Particle Diameter (mm),
132 Saturated Hydraulic Conductivity (mm/hr),200
133 Infiltration Media Porosity,0.35
134 Length (m),
135 Bed slope,
136 Base Width (m),
137 Top width (m),
138 Vegetation height (m),

```

139 Vegetation Type,Vegetated with Effective Nutrient Removal Plants
 140 Total Nitrogen Content in Filter (mg/kg),400
 141 Orthophosphate Content in Filter (mg/kg),55
 142 Is Base Lined?,Yes
 143 Is Underdrain Present?,Yes
 144 Is Submerged Zone Present?,No
 145 Submerged Zone Depth (m),
 146 B for Media Soil Texture,13
 147 Proportion of upstream impervious area treated,
 148 Exfiltration Rate (mm/hr),0
 149 Evaporative Loss as % of PET,100
 150 Depth in metres below the drain pipe,
 151 TSS A Coefficient,
 152 TSS B Coefficient,
 153 TP A Coefficient,
 154 TP B Coefficient,
 155 TN A Coefficient,
 156 TN B Coefficient,
 157 Sfc,0.61
 158 S*,0.37
 159 Sw,0.11
 160 Sh,0.05
 161 Emax (m/day),0.008
 162 Ew (m/day),0.001
 163 IN - Mean Annual Flow (ML/yr),1.06
 164 IN - TSS Mean Annual Load (kg/yr),146
 165 IN - TP Mean Annual Load (kg/yr),0.383
 166 IN - TN Mean Annual Load (kg/yr),2.48
 167 IN - Gross Pollutant Mean Annual Load (kg/yr),20.2
 168 OUT - Mean Annual Flow (ML/yr),1.01
 169 OUT - TSS Mean Annual Load (kg/yr),14.7
 170 OUT - TP Mean Annual Load (kg/yr),0.149
 171 OUT - TN Mean Annual Load (kg/yr),0.939
 172 OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
 173 Flow In (ML/yr),1.05788
 174 ET Loss (ML/yr),0.0495428
 175 Infiltration Loss (ML/yr),0
 176 Low Flow Bypass Out (ML/yr),0
 177 High Flow Bypass Out (ML/yr),0
 178 Orifice / Filter Out (ML/yr),0.82654
 179 Weir Out (ML/yr),0.179501
 180 Transfer Function Out (ML/yr),0
 181 Reuse Supplied (ML/yr),0
 182 Reuse Requested (ML/yr),0
 183 % Reuse Demand Met,0
 184 % Load Reduction,4.90039
 185 TSS Flow In (kg/yr),145.931
 186 TSS ET Loss (kg/yr),0
 187 TSS Infiltration Loss (kg/yr),0
 188 TSS Low Flow Bypass Out (kg/yr),0
 189 TSS High Flow Bypass Out (kg/yr),0
 190 TSS Orifice / Filter Out (kg/yr),2.16153
 191 TSS Weir Out (kg/yr),12.5396
 192 TSS Transfer Function Out (kg/yr),0
 193 TSS Reuse Supplied (kg/yr),0
 194 TSS Reuse Requested (kg/yr),0
 195 TSS % Reuse Demand Met,0
 196 TSS % Load Reduction,89.926
 197 TP Flow In (kg/yr),0.382492
 198 TP ET Loss (kg/yr),0
 199 TP Infiltration Loss (kg/yr),0
 200 TP Low Flow Bypass Out (kg/yr),0
 201 TP High Flow Bypass Out (kg/yr),0
 202 TP Orifice / Filter Out (kg/yr),0.104958
 203 TP Weir Out (kg/yr),0.0438896
 204 TP Transfer Function Out (kg/yr),0
 205 TP Reuse Supplied (kg/yr),0
 206 TP Reuse Requested (kg/yr),0
 207 TP % Reuse Demand Met,0
 208 TP % Load Reduction,61.0847
 209 TN Flow In (kg/yr),2.48071
 210 TN ET Loss (kg/yr),0
 211 TN Infiltration Loss (kg/yr),0

212 TN Low Flow Bypass Out (kg/yr),0
 213 TN High Flow Bypass Out (kg/yr),0
 214 TN Orifice / Filter Out (kg/yr),0.526948
 215 TN Weir Out (kg/yr),0.409894
 216 TN Transfer Function Out (kg/yr),0
 217 TN Reuse Supplied (kg/yr),0
 218 TN Reuse Requested (kg/yr),0
 219 TN % Reuse Demand Met,0
 220 TN % Load Reduction,62.235
 221 GP Flow In (kg/yr),20.1821
 222 GP ET Loss (kg/yr),0
 223 GP Infiltration Loss (kg/yr),0
 224 GP Low Flow Bypass Out (kg/yr),0
 225 GP High Flow Bypass Out (kg/yr),0
 226 GP Orifice / Filter Out (kg/yr),0
 227 GP Weir Out (kg/yr),0
 228 GP Transfer Function Out (kg/yr),0
 229 GP Reuse Supplied (kg/yr),0
 230 GP Reuse Requested (kg/yr),0
 231 GP % Reuse Demand Met,0
 232 GP % Load Reduction,100
 233 PET Scaling Factor,2.1
 234
 235 No Generic treatment nodes
 236
 237 Other nodes
 238 Location,Receiving Node
 239 ID,7
 240 Node Type,ReceivingNode
 241 IN - Mean Annual Flow (ML/yr),1.01
 242 IN - TSS Mean Annual Load (kg/yr),14.7
 243 IN - TP Mean Annual Load (kg/yr),0.149
 244 IN - TN Mean Annual Load (kg/yr),0.939
 245 IN - Gross Pollutant Mean Annual Load (kg/yr),0.00
 246 OUT - Mean Annual Flow (ML/yr),1.01
 247 OUT - TSS Mean Annual Load (kg/yr),14.7
 248 OUT - TP Mean Annual Load (kg/yr),0.149
 249 OUT - TN Mean Annual Load (kg/yr),0.939
 250 OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
 251 % Load Reduction,4.65
 252 TSS % Load Reduction,89.9
 253 TN % Load Reduction,62.2
 254 TP % Load Reduction,61.0
 255 GP % Load Reduction,100
 256
 257 Links
 258 Location,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link
 259 Source node ID,2,3,4,5,1
 260 Target node ID,1,1,1,1,7
 261 Muskingum-Cunge Routing,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed
 262 Muskingum K, , , , ,
 263 Muskingum theta, , , , ,
 264 IN - Mean Annual Flow (ML/yr),0.536,44.7E-3,0.209,0.268,1.01
 265 IN - TSS Mean Annual Load (kg/yr),74.2,6.22,28.4,37.1,14.7
 266 IN - TP Mean Annual Load (kg/yr),0.193,16.0E-3,75.6E-3,97.6E-3,0.149
 267 IN - TN Mean Annual Load (kg/yr),1.26,0.104,0.488,0.626,0.939
 268 IN - Gross Pollutant Mean Annual Load (kg/yr),10.2,0.853,3.98,5.12,0.00
 269 OUT - Mean Annual Flow (ML/yr),0.536,44.7E-3,0.209,0.268,1.01
 270 OUT - TSS Mean Annual Load (kg/yr),74.2,6.22,28.4,37.1,14.7
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 272 OUT - TN Mean Annual Load (kg/yr),1.26,0.104,0.488,0.626,0.939
 273 OUT - Gross Pollutant Mean Annual Load (kg/yr),10.2,0.853,3.98,5.12,0.00
 274
 275 Catchment Details
 276 Catchment Name,Douglas Option2
 277 Timestep,6 Minutes
 278 Start Date,1/01/1917
 279 End Date,31/12/1962 11:54:00 PM
 280 Rainfall Station, 31055 MOSSMAN
 281 ET Station,User-defined monthly PET
 282 Mean Annual Rainfall (mm), 1608
 283 Mean Annual ET (mm), 2291
 284

APPENDIX D STORMWATER LAYOUT



OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN – R&D FACILITY

34 Mill Street, Mossman 4873

For CocoNutz Australia Pty Ltd
April 2021



WOLTER
consulting group

Planning Urban Design Landscape Environment Surveying

Level 2, 1 Breakfast Creek Road, Newstead QLD 4006

PO Box 436 New Farm QLD 4005

P: (07) 3666 5200 F: (07) 3666 5202

admin@wolterconsulting.com.au

ABN: 63 366 350 062

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APPENDICES

Appendix A: Environmental Procedures

1. GLOSSARY & DEFINITIONS

Abbreviation	Description
ARI	Average Recurrence Interval
AS	Australian Standard
ASS	Acid Sulfate Soils
BioA	Biosecurity Act 2014
CEMP	Construction Environmental Management Plan
CPESC	Certified Practitioner of Erosion and Sediment Control
CLR	Contaminated Land Register
dB	Decibels
dBA	A-weighted decibels
DEE	Department of Environment and Energy
DES	Department of Environment and Science
DAFF	Department of Agriculture Forestry and Fisheries (QLD)
DBH	Diameter at Breast Height
DSC	Douglas Shire Council
EA	Environmental Authority
EPAct	Environmental Protection Act 1994 (QLD)

Abbreviation	Description
EIS	Environmental Impact Statement
EMR	Environmental Management Register
EMP	Environmental Management Plan
EP	Equivalent Person
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (C'wealth)
ERA	Environmentally Relevant Activity
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
EVNT	Endangered, Vulnerable and Near Threatened
GIS	Geographic information system
km	Kilometre
LA _{eq, adj, 15min}	A-weighted SPL of a continuous steady sound, adjusted for tonal character that within any 15 minute period has the same square sound pressure as a sound level that varies with time
LGA	Local Government Area
m	Metre
MCU	Material Change of Use

Abbreviation	Description
MNES	Matter of National Environmental Significance
MSES	Matter of State Environmental Significance
MLES	Matter of Local Environmental Significance
NATA	National Association of Testing Authorities
NCA	Nature Conservation Act 1992 (QLD)
PASS	Potential Acid Sulfate Soils
QLD	Queensland
R&D	Research and Design
RE	Regional Ecosystem
RoL / RaL	Reconfiguration of a Lot
ROW	Right of Way
SDS	Safety Data Sheets
SPL	Sound Pressure Level
TPZ	Tree Protection Zone
VMA	Vegetation Management Act 1999 (QLD)
WONs	Weed of National Significance

Term	Description
The Activity	Operation of the research and design facility and all associated aspects
Administering Authority	Unless otherwise defined the Local Government authority responsible for the geographic region in which the project is located
Authorised Person	A person holding office under an appointment pursuant to the <i>Environmental Protection Act 1994</i> .
Background Noise Level	The A-weighted sound pressure level exceeded for 90% of the time period (15 minutes or greater) using fast response.
Clearing	<p><i>In reference to Grass Scrub or Bush:</i> Removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include</p> <ul style="list-style-type: none"> i. Flattening or compaction by vehicles if the vegetation remains living ii. Slashing or mowing of vegetation to facilitate access tracks iii. Weed removal <p><i>In refence to Trees:</i> Cutting down, ringbarking, pushing over, poisoning or destroying in any way.</p>

Term	Description
Commercial Place	A place used as an office or business or commercial purposes
Construction Foreman	The principal contractors site representative
Consultant	The person or team the principle employs with respect to environmental issues and administration of the EMP
Contaminant	A gas, liquid or solid or an odour or an organism (including a virus) or energy sources including noise, heat radioactivity and electromagnetic radiation.
Contamination	The release (whether by act or emission) of a contaminant into the environment.
Contractor (Major, Major Civil)	Party or company performing civil construction works on the site (including employees and sub-contractors)
Environment	<ul style="list-style-type: none"> a) Ecosystems and their constituent parts including people communities; and b) All natural and physical resources; and c) The qualities and characteristics of locations and places however large or small that contribute to their

Term	Description
	<p>biological diversity and integrity, intrinsic or attributed scientific value, or interest amenity/harmony/sense of community; and</p> <p>d) The social, economic, aesthetic and cultural conditions that affect or are affected by the things mentioned in a) to c).</p>
Environmental Incident	Any occurrence that has resulted in or has the potential to result in adverse consequences to the environment, including air, water, land, natural resources, flora, fauna, habitats, ecosystems and/or biodiversity.
Environmental Harm	Any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an Environmental Value.
Environmental Nuisance	The unreasonable interference or likely interference with an environmental value.
Environmental Value	<ul style="list-style-type: none"> a) A quality or physical characteristic of the environment that is conducive to ecological health, public amenity or safety; or b) Another quality of the environment identified and declared to be an

Term	Description
	environmental value under an environmental protection policy or regulation.
Land	Land excluding waters and the atmosphere
LA _{eq,adj} , 15min	A-weighted SPL of a continuous steady sound, adjusted for tonal character that within any 15 minute period has the same square sound pressure as a sound level that varies with time
Material Environmental Harm	<p>Environmental Harm other than environmental nuisance:</p> <ul style="list-style-type: none"> a) That is not trivial or negligible in nature, extent or context; or b) That causes actual or potential loss or damage to property of an amount of, or amounts totalling more than the threshold amount but less than the maximum amount; or c) That results in costs of more than the threshold amount but less than the maximum amount being incurred in taking appropriate action to: <ul style="list-style-type: none"> i. Prevent or minimise the harm; and ii. Rehabilitate or restore the environment to its

Term	Description
	condition before the harm
Noise Sensitive Place	<p>Any of the following places:</p> <ul style="list-style-type: none"> a) A dwelling; b) A library, child-care centre, kindergarten, school, college, university or other educational institution; c) A hospital, surgery or other medical institution; d) A protected area, or an area identified under a conservation plan as a critical habitat or an area of major interest pursuant to the Nature Conservation Act 1992 e) A Marine Park f) A park or garden that is open to the public for use other than for sport or organised entertainment.
Noxious	Harmful or injurious to health or well-being
Site Manager	The Developer's site representative
Proponent, Principle or Developer	The entity responsible for overall control and responsibility of the project (i.e. CocoNutz Australia Pty Ltd).

Term	Description
Regulated Waste	Non-domestic waste mentioned in Schedule 8 of the <i>Environmental Protection Regulation 2008</i>
Serious Environmental Harm	<p>Environmental Harm other than environmental nuisance:</p> <ul style="list-style-type: none"> a) That causes actual or potential harm to environmental values that is irreversible, of a high impact, or widespread; or b) That causes actual or potential harm to environmental values of an area of high conservation value or special significance; or c) That causes actual or potential loss or damage to property or damage to property of an amount of, or amounts totalling more than the threshold amount; or d) That results in costs of more than the threshold amount being incurred in taking appropriate action to: <ul style="list-style-type: none"> i. Prevent or minimise the harm; and ii. Rehabilitate or restore the environment to its

Term	Description
	condition before the harm
Study Area	The area surrounding the study site in which the EMP and associated environmental aspects have been investigated.
Subject Site (the site)	The footprint in which the facility and activity will be undertaken
Waste	Gas, liquid, solid or energy (or combination of any) that is surplus to or unwanted from any industrial, commercial, domestic or other activity, whether or not of value.
Waters	Includes the bed and/or banks of any water(s) stormwater runoff and any part of a stream, river, lake, lagoon, pond, dam, swamp, wetland, unconfined surface water, underground water, natural and artificial watercourse, stormwater channel, stormwater drain or roadside gutter.
Watercourse	As defined in section 5 of the Water Act 2000 (QLD) and includes the bed and banks and any other element of a river, creek or stream confining or containing water.
Waterway	As defined under the Fisheries Act 1994 (QLD) and marked on the spatial data layer Queensland Waterways for Waterway Barrier Works

Term	Description
Weeds	Inclusive of all Weeds of National Significance, and all classes of locally defined species and species declared as <i>prohibited or restricted</i> as per the <i>Biosecurity Act 2014</i>

2. INTRODUCTION

2.1. BACKGROUND

Wolter Consulting Group (WCG) was engaged by Cococutz Australia Pty Ltd (CAPL, hereafter referred to as 'the principle') to prepare an Environmental Management Plan (EMP) to provide a framework to manage the cumulative environmental impacts potentially resulting from the process of manufacturing product at a R&D facility located within the existing Mossman Sugar Mill.

The Mossman Sugar Mill is located at 34 Mill Road, Mossman and the R & D facility which is the subject of this EMP is located within the greater mill facility (owned and operated by Far Northern Milling Pty Ltd). The facility will operate under a five (5) year lease agreement between the Principal and Far North Milling Pty Ltd and will utilise some aspects of the mill infrastructure.

This Environmental Management Plan (EMP) has been prepared to provide a framework to achieve compliance with relevant environmental regulations and legislation and to inform management of the activities associated with the production stream.

2.2. SITE LOCATION AND CHARACTERISTICS

In definition of this plan, the overall study area will represent the area associated with the greater sugar mill activities whilst the subject site (or the site) will be represented

by the structures, machinery and immediate surrounds in which the activity will be conducted (i.e. the propose R&D facility).

Relevant features and characteristics of the study area include:

- Road access suitable for heavy vehicles.
- Existing storage and processing of mill mud and cane fibre (bagasse).
- Housing nearby is owned by Far Northern Milling.
- Far North Milling Pty Ltd Mossman sugar mill. Operational 24/7 during the cane processing season (June-November), and weekday work outside of this for maintenance activities.

The subject site (i.e. location of the facility) is represented by area to the north west of the greater mill property containing two (2) existing but un-used structures that will house the R&D facility, internal road networks and office spaces.

Refer to **Figure 1** for aerial image of the Study Area and Subject Site.

2.3. PROJECT & PROCESS DESCRIPTION

The principle is a food technology company that specialises and holds patents for fermentation biotechnology to produce natural flavours and aromas to be used in foodstuffs and condiments. Specifically, it has been realised that sourcing a major ingredient (coconut sugar) in the product Kecap Manis requires highly intensive and dangerous procedures that are non-sustainable with the growing demand for the product.

Figure 1: Aerial image of the site and contextual detail

The principle proposes to construct an R&D facility to evaluate utilising bio-technology to replace the coconut sugar with a natural sugar alternative at a scale which will confirm if the process can be commercialised. This evaluation has been estimated to produce 3,000T of Kecap Manis using 10,700T of sugar cane over the first year of operation. Operations are to be conducted 24 hours a day with certain aspects of the production train being limited to daytime hours.

The activity will be required to operate under ERA 28 Sugar milling and refining and is proposed to operate under two (2) distinct operational phases due to constraints associated with operational noise impacts. Refer **Section 4.5** for further details regarding noise impacts.

The process consists four (4) broad stages summarised as follows.

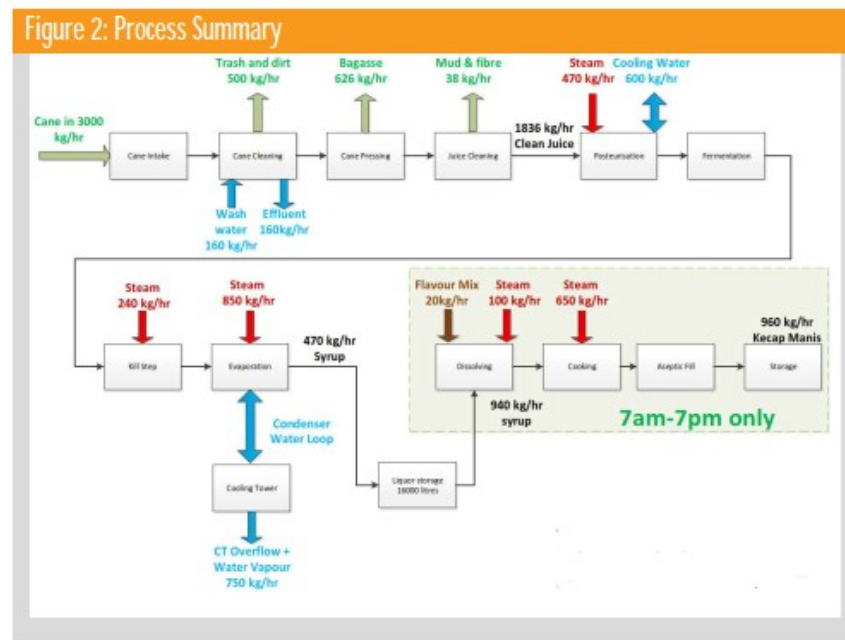
1. **Cane supply, cleaning and juice extraction.** Green harvested sugar cane will be transported from cane sidings to site by road using a multi-lift and deposited on a concrete pad at the Eastern side of the facility. The anticipated production rate of the facility is based on a throughput of three (3) tonnes per hour of cane billets. This is equivalent to 72 tonnes per day of cane billets, approximately three (3) loads on a multi-lift. Based on 70% efficiency and 150 operating days per season, the annual billet consumption is 10,700 tonnes per year. Billet storage of 12 hours is required for overnight operations which is equivalent to a cane storage requirement of around 100m³. Extraneous matter delivered with the cane billets will be removed in two (2) stages of cane cleaning. The waste material removed will be added to Far Northern Milling's (FNM) biomass stockpile. Tramp iron will be removed using an

electromagnet on a cane conveyor. Juice will be extracted from the cane using a twin tandem of mills. Exhausted cane fibre will be added to FNM's biomass stockpile. The cane juice will be filtered, decanted and centrifuged to remove suspended solids. The solids will be added to FNM's mill mud stockpile.

2. **Fermentation and Pasteurisation.** Clean juice is pasteurised to prevent natural microbes in cane juice from impacting the fermentation process. Four fermenters are used for the biocatalytic transformation of the cane juice. The temperature is controlled using a chiller unit. To ensure no microbes remain in the juice, a "kill-step" heats the juice up to a temperature high enough to sterilise the juice.
3. **Evaporation.** The hot juice is thickened into a syrup using four (4) evaporation stages. An initial 3-body evaporation uses the vapour generated at each stage to heat the following stage and evaporates 90% of the required water. A final stirred evaporation stage provides the fine control to get the product to the required water content. A condenser is used to extract the final vapour from the evaporators, and the energy from this is removed in the cooling tower. Evaporated syrup has a high sugar content and low water activity, giving it a long shelf life and can be packed and used at a later stage for final processing into Kecap Manis. The syrup is stored in a heated buffer tank where it is will be processed further during day working hours.
4. **Cooking and packaging.** Dry ingredients are added to the syrup to create the desired flavour profile. It is then cooked at boiling point to finalise the flavour

in stirred, heated vessels. The product then passes through a cooler and is aseptically packed into bags and stored in plastic drums on pallets. The product will be loaded onto semis and shipped overseas.

The process is summarised on **Figure 2** below with relevant inputs and outputs included.



2.4. STATUTORY REQUIREMENTS

This EMP aims to generally comply with the relevant requirements of the *Environmental Protection Act 1994* (EPAct), Local Authority Policy and Local Laws, Environmental Management Plan, Research and Design Facility – CocoNutz Australia Pty Ltd

and stated requirements of the Local Authority. All persons associated with this project are to read and understand their Environmental Duty under the EPAct.

This EMP generally complies with the relevant requirements of:

- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).
- *Environmental Protection Act 1994* (Qld).
- *Environmental Protection (Air) Policy 2019* (Qld).
- *Environmental Protection (Water) Policy 2009* (Qld).
- *Ecoaccess Guideline Noise – Planning for noise control.*
- *Environmental Protection (Waste Management) Policy 2000* (Qld); and
- *Nature Conservation Act 1992* (Qld).

2.5. AIMS & OBJECTIVES OF THE EMP

The objectives of this EMP are:

- To provide a framework to inform relevant stakeholders of the minimum environmental management requirements that must be met or exceeded during the activities on site.
- To provide achievable management systems to generally comply with the requirements of the EPAct and regulatory Local Authority Policy / requirements.

- The identification and details, roles and responsibility of all site staff with respect to compliance with the minimum environmental management requirements.
- To provide evidence of practical and achievable plans for the management of the site to ensure vegetation clearing is conducted in a transparent and responsible manner. This is achieved by producing an integrated framework for comprehensive management, monitoring and control of operational phase impacts. Specific commitments to strategies and design standards are also provided.
- To provide Local, State and Commonwealth Authorities, and Management with a framework to confirm compliance with policies and conditions.
- To provide the community with evidence that the management of the site is occurring in an environmentally acceptable manner; and
- To provide a framework for management with an effective tool to accomplish the above.

2.6. FUNCTIONS OF THE EMP

This EMP provides for the following functions:

- The monitoring of releases of contaminants into the environment.
- The corrective actions to be implemented in the event of accidental release of contaminants beyond that considered acceptable.
- The relevant training of those associated with the development's construction to competent levels in the following (at a minimum):

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- Relevant environmental conservation objectives and targets.
- Control procedures of day to day operational activities to prevent or minimize environmental harm.
- Contingency plans and emergency procedures to deal with unforeseeable risks and hazards to the environment.
- Organisational structure and responsibility to ensure that roles are appropriately defined to manage environmental issues.
- Effective communication of environmental matters; and
- Documentation systems to ensure that record keeping is effective and intuitive and achieves the goal of demonstrating environmental commitments.

2.7. OTHER REQUIREMENTS

A current version of this EMP must be kept on site during the operational phase of the activity.

The Principal is not to implement this EMP, nor amend this EMP, where such implementation or amendment would result in a contravention of any condition imposed under the EPAct or Local / State Government Policy / Approvals, unless otherwise approved by the Administering Authority.

The Principal must submit details of any proposed amendment to this EMP to the Administering Authority.

2.8. EMP STRUCTURE

Specific management systems have been provided to assist the project to comply with the requirements detailed above. As part of the management, monitoring, auditing and reporting functions; data sheets, check lists and record sheets have been included in the Appendices of this report.

The EMP is structured as follows:

- An introduction providing an overview of the proposal and details of the EMP.
- Program and contractual obligations of relevant stakeholders.
- Assessment of the current environmental significance of the study area and surrounds and identification of potential sensitive receivers.
- Discussion and evaluation of the potential environmental impacts resulting from the development.
- Details of the proposed Environmental Management Systems / Procedures.
- Training Requirements.
- EMP implementation and relationship to Quality Assurance Systems.
- Continual Improvement Requirements.
- Conclusion and recommendations

Each significant environmental issue is addressed by an 'Environmental Procedure' (EP) that encompasses the following details.

Table A: Environmental Procedure Content

EP Section	Description
Objectives	The performance requirements for the element
Management Strategy	The strategies that will be implemented to achieve the objectives.
Actions	Mechanisms proposed to achieve management strategy including monitoring requirements.
Performance Criteria/Indicators	Demonstration of implementation of Management Strategies and Monitoring
Reporting/Responsibility	The format, timing and responsibility for reporting and auditing of the results of monitoring and
Corrective Action	The action to be implemented if the performance objective is not achieved and identification of the relevant stakeholder responsible for the non-conformance

Refer **Appendix A** for Environmental Procedures.

2.9. CONTINUAL IMPROVEMENT

This EMP is to be periodically reviewed and updated by the Principal to reflect knowledge gained during the course of operational phase activities, and to reflect new knowledge, or future best practices as they become available. Changes to the EMP will be developed, and implemented, in consultation with the administering authority.

It is recommended that such reviews be undertaken:

- At regular time frames annually.
- When new practices are undertaken on the site outside those covered by this EMP.

- If the production process is modified.
- When new knowledge on existing processes becomes available.

2.10. EMP LIFESPAN

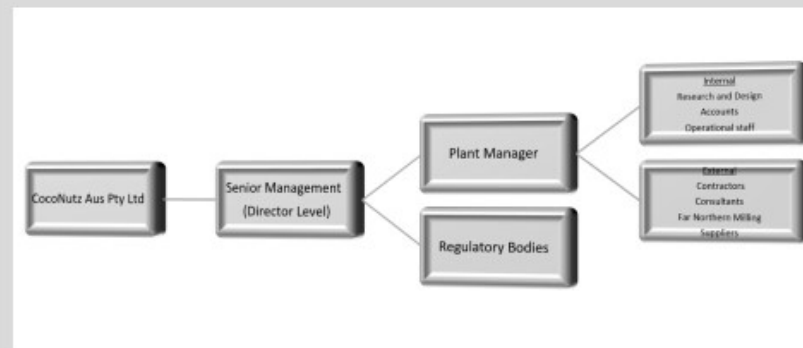
The requirements of this document (and future revisions) will remain in force for the lifespan of the activity.

3. PREAMBLE

3.1. ORGANISATIONAL CHART

The following organisational chart describes the general framework with respect to environmental management issues to be implemented/adopted during the activity and production process.

Figure 3: Organisational Chart



Unless otherwise stated under contract, and with consideration that the principle (i.e. CAPL) will be responsible for the site, the principle is generally nominated pursuant to this EMP as the entity responsible for environmental management.

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The principle may at their discretion, delegate responsibility to relevant sub-contractors where the delegation is agreed upon in writing and/or contractual agreement. This may be relevant for construction phase activities or other scenarios where delegation of authority is required.

3.2. PROGRAM & CONTRACTUAL OBLIGATIONS

The principle is required to provide monitoring from commencement of the works and activity for the operational lifespan of the activity. Refer Definitions in **Section 1.0**. Although the Principal may hold ultimate responsibility to ensure that the proposed activity complies with relevant environmental legislation, such as the *Environmental Protection Act (EPAct) 1994*, where duties are subordinated to a Contractor, this EMP should be treated as a condition of contract.

It should be noted that the *Environmental Protection Act* places a duty on any person, undertaking any activity, to report any incident/s that may cause environmental harm (i.e. General Environmental Duty).

3.3. CORRECTIVE ACTION

The Principal (or principles delegate) or the Contractor is required to complete Corrective Action Request (CAR) forms where non-compliance with the procedures in this document is identified. The Principal (or principles delegate) or the Contractor are also required to maintain a register of CARs that shall demonstrate that all required remediation/monitoring measures have been completed.

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In some instances, further investigation or monitoring will be required to establish whether the Contractor has adequately implemented the EMP or is in compliance with relevant legislation, guidelines and statutes. If it is established that the cause for complaint has arisen from the Contractor's actions or omissions, then the costs of the monitoring may be deducted from payments to the Contractor, to offset Consultant costs.

3.4. DISPLAY OF THIS EMP

A copy of this EMP is to be kept on site in a location readily accessible to personnel carrying out activities at the site.

3.5. RECORD KEEPING

Any records or documents which are to be retained as part of this EMP are to be held for a period of no less than three (3) years. Records are to be available for examination by an authorised person upon request.

3.6. ALTERATIONS

No change, replacement or new operation is permitted if the change, replacement or new operation increases, or is likely to substantially increase, the risk of environmental harm above that which is expressly provided by this EMP.

An example of a substantial increase in the risk of environmental harm is an increase of 10% or more in the quantity of a contaminant to be released into the environment.

3.7. CALIBRATION

All instruments and devices used for the measurement or monitoring of any parameter required by this EMP must be calibrated, and appropriately operated and maintained in accordance with manufacturer's recommendations.

3.8. TECHNICAL TRAINING

All personnel involved in the undertaking of monitoring of environmental variables shall be suitably trained to undertake such monitoring and in the use of any instruments required to do so.

4. ENVIRONMENTAL ASSESSMENT

This section has been formulated to assess the study area's environmental values and potential impacts of the proposed activity. It provides a description of the ecological values identified based on desktop review assessing the environmental aspects within the study area and study site.

The EA identifies relevant features and potential sensitive receptors of the area based on the following categories:

- Land Management.
- Water Resources.
- Nature Conservation.
- Air Quality.
- Noise Emissions.
- Waste.
- Transport; and
- Cultural Heritage.

Each section will also provide assessment of the potential direct and indirect impacts that may result from the proposed activity.

4.1. LAND MANAGEMENT

4.1.1. LAND USE AND HUMAN ACTIVITIES

Mossman is considered as a regional centre and as such holds a variety of land uses designated under the Douglas Shire Council (DSC) planning scheme (DSCPS). Of particular relevance to this assessment is the identification of sensitive receivers. In relation to land use versus the proposed activity we would consider that areas nominated for residential usage to represent the most likely to be impacted from potential direct and indirect impacts. The closest residential properties to the subject site (aside from those owned by FNM to house mill staff) are located approximately 130m SSW (Lot 10 on RP706271).

4.1.2. SOIL MANAGEMENT

Subsurface soil conditions have been obtained from review of borelogs associated with the groundwater bore located on 32/SP176441 (immediately east of the study area).

In general, the subsurface environment is described as *Mossman River Alluvium* overlying the base weathered slate *Hodgkinson Formation*. The overlying alluvium is composed of 7.3m clay overlying sand and gravel to 20.7m depth. From 20.7m Grey clays dominate until the base slates occur at 30.5m. The occurrence of old timber at 24.4m reiterates the dominance of alluvial materials in the soil column with the predominant soil building process of deposition being typical of estuarine and riverine ecosystems.

4.1.3. ACID SULFATE SOIL

The majority of the study area is 5-20 AHD with the northern extent <5m AHD where soil excavation or compaction may expose ASS or PASS to reactive O².

4.1.4. DIRECT IMPACTS

The activity does not involve earthworks excavation nor filling activities and as such there will be no direct impacts on the environment resulting from the presence of subsurface ASS or PASS.

Additionally, the dominance of clay in the upper layers of the soil profile suggest that soils are stable and unlikely to be impacted by the operation of the facility.

4.1.5. INDIRECT IMPACTS

Given the interpreted stability of soils associated with the study area, indirect impacts are unlikely.

4.2. WATER RESOURCES

4.2.1. GROUNDWATER

The Environmental Protection (water) Policy identifies groundwater zones across QLD where similar groundwater characteristics can be categorised. The study area is nominated as *Zone 9 Groundwater – Coastal and floodplain*. The typical chemistry of

groundwater associated with this category describes high levels of salts (NaCl) with generally lower salinity levels.

In addition to the EPP groundwater zone classification, a groundwater bore is located in close proximity to the study area (on 32/SP176441). The bore has been monitored since 1975 and provides suitable data to extrapolate groundwater details within the study area.

The average depth to groundwater within the bore is -6.44m below natural surface with a max depth of -7.19m and a minimum depth of -4.52m below natural surface.

Water chemistry generally confirms the EPP categorisation with high levels of Sodium (Na) and Chlorine (Cl) observed throughout the reported monitoring period.

4.2.2. SURFACE WATER

The study area is located within the Mossman River Basin which contains 16.4km² of estuarine systems, 2.0km² of palustrine systems, 4.3km² of riverine systems and 0.2km² of lacustrine environments.

Regarding the study area, surface waters represented by the South Mossman River (2nd order) and Parker Creek (3rd order) closely adjoin the study areas northern and eastern boundaries. The South Mossman River is considered as a *watercourse* pursuant to the *Water Act 2000* and Parker Creek as a *Drainage* line and both are tributaries to the Mossman River system located to the north of the study area. Both waterways represent sensitive receivers to potential impacts from the activity.

Review of 100Year ARI flood levels determined from Mossman flood studies indicate that the 1:100 flood ARI is likely to affect the study area, however the subject site is located to be immune. Substantial areas of the north-eastern extent of the greater mill site are likely to be inundated during significant flood events. We note these areas include land nominated as a release point under the greater mill EA (Ref: EPPR00920713).

4.2.3. DIRECT IMPACTS

Potential anthropogenic impacts to groundwater include industrial operations, leaking fuel tanks and runoff from roads. Interference with groundwater will not be required within the production line process however the release of surface waters has potential to impact the quality and chemical composition of both the groundwater and surface waters within the range of influence.

Whilst discharge of potentially polluted stormwater to the environment has substantial potential to cause environmental harm, it is understood that all surface water flows that occur within the subject site will be directed into the FNM mill stormwater treatment train. Given the area upon which the facility is located already represents sealed hardstand with buildings that are to be retro fitted, additional stormwater flows above that already experienced by the mill are not anticipated. Direction of stormwater into the greater mill treatment train will provide adequate management to prevent direct impacts from potentially polluted water flows. Additionally, any effects of groundwater recharge that may result from discharge

waters will be via the FNM mill stormwater treatment train and will be treated in accordance with the current Environmental Authority.

Interference with groundwater will not be required within the production line process.

4.2.4. INDIRECT IMPACTS

Potential alteration to the chemical composition and quality of both surface and groundwaters associated with the site may indirectly result in impacts to aquatic fauna and macroinvertebrate populations with flow on effects through the food chain. Adequate management of discharge waters is paramount to prevent long term impacts.

4.3. NATURE CONSERVATION

4.3.1. TERRESTRIAL FLORA

Given the study sites current usage, terrestrial flora is generally limited to individual retained trees and screening plantings. However, riparian vegetation associated with the South Mossman River and Parkers Creek is present at the eastern and north eastern boundaries of the greater mill site (i.e. the study area) with a substantial tongue extending from the north approximately 250m into the site.

The riparian vegetation is identified on the Queensland Herbariums Regional Ecosystem mapping as RE 7.3.23 *Simple to complex semi-deciduous notophyll to mesophyll vine forest*. Areas within the site are indicated as remnant vegetation however a mosaic of both remnant and high value regrowth is associated with the

riparian complex. RE 7.3.23 is considered as an *Endangered* community pursuant to the *Vegetation Management Act 1999*.

RE 7.3.10 (*Simple-complex mesophyll to notophyll vine forest*) is also present within the mosaic of riparian vegetation however the majority of this community is centred further to the east where the South Mossman River separates from Parker Creek.

Several protected plants have been recorded within the study area and the areas of riparian vegetation are designated as *Protected Plant Survey Trigger Areas* under the *Nature Conservation Act 1994* and as *Essential Habitat* pursuant to the *VMA 1999*. Based on the vegetation communities associated with the site and study area adjoining the site, two (2) recorded EVNT flora species have potential to occur as follows:

- Orange Tamarind (*Toeckima pterocarpum*) – *Endangered*; and
- Dioclea hexandra – *Vulnerable*.

The area housing the footprint of the R&D facility does not house any specific vegetation of conservation value.

4.3.2. TERRESTRIAL FAUNA

Interrogation of available fauna record databases suggests the potential presence of eight (8) amphibians, four (4) reptiles and four (4) mammals within a 2km radius that have a protected status of *Endangered*, *Vulnerable* or *Near Threatened* pursuant to the *Nature Conservation Act 1992*.

Notwithstanding the fauna holding elevated status under the act, all native species hold protection under the NC Act. Given the large waterway corridor of vegetation present within the greater mill area it is likely that a variety of transient fauna could occur in the study area and study site.

4.3.3. DIRECT IMPACTS

Given that the proposed activity is to adapt and upgrade existing infrastructure on the subject site it is anticipated that no direct impacts will threaten any of the identified EVNT fauna potentially occurring in the study area. No clearing of vegetation will be required to accommodate the proposal and as such EVNT flora and fauna potentially associated with the subject site will not be adversely affected.

4.3.4. INDIRECT IMPACTS

The increase and compositional alterations to the mill operations waste streams resulting from the activity are of a quantity that is not considered to potentially result in any adverse effects to the ecology of the subject site and study area. Management of potential pollutive waste streams (i.e. under the greater mill management systems) is expected to be of an adequate scale to mitigate impacts to a tolerable level.

4.4. AIR QUALITY

Wind roses interrogated as a component of the Air Quality Assessment (undertaken by Vipac 2021) from 9am and 3pm recorded data indicate that the key features of the winds typical to the subject site are:

- Winds are predominantly from the southeast with average wind speed of 2.5 m/s;
- The winds are largely consistent throughout the seasons with flows following the dominating terrain patterns to the east and west of the site.

The primary sources of air emissions in the region immediately surrounding the Project site are from the greater sugar mill activities and wind-blown dust primarily including PM₁₀ and PM_{2.5}.

Given the remoteness of the location, background levels of pollutants at the Project site are expected to be low except for those affected by the Sugar Mill operations and consequentially, there are no nearby Queensland Department of Environment and Science (DES) air quality monitoring stations currently operating. As such, the background emissions levels for the greater mill operations (representing the ambient air quality levels) have been sourced from the National Pollutant Inventory report 2018/2019 and the stack parameters based on the greater mills Environmental Authority (Ref: EPPR00920713). These are provided in **Table B** below.

Table B: Predicted Air Emissions

Emission	Source	Rate (g/s)
CO	Boiler	22.47
NO _x	Boiler	6.54
PM ₁₀	Boiler	6.46
PM _{2.5}	Boiler	3.74
SO ₂	Boiler	2.15
Ethanol	Fugitive VOC	0.34

Further information relating to air quality assessment and air quality is provided in the Air Quality Assessment prepared by VITEC dated 26 March 2021.

4.4.1. DIRECT IMPACTS

It has been determined that emissions from the proposed R&D facility are unlikely to provide concentrations of gases and particulates that exceed the ambient background levels at sensitive receivers (Vitec, 2021) and in fact for all gases and particulates (with the exception of CO) are significantly lower than those emitted by the mill.

4.4.2. INDIRECT IMPACTS

Given the low concentrations of emissions predicted to be created by the facility, indirect impacts on the surrounding environment or sensitive receivers are not anticipated.

4.5. NOISE

The existing noise related environment within the study area is substantially dominated by the existing mill operations that operates under ERA permits, but, is not encumbered with specific upper noise limits to adhere to. This is particularly evident during the crushing season (June-November).

During the crushing period noise modelling has adopted a conservative ambient background noise level of 40dBA (during night periods).

Periods where the greater mill is not undertaking crushing activities, background noise levels will be substantially lower with mill activities limited to general maintenance of plant, buildings and infrastructure.

4.5.1. DIRECT IMPACTS

Potential affected receivers are represented by nearby residences including those owned by Far Northern Milling and house mill staff. The nearest off-site residences are located approximately 130m from the proposed facility to the SSW.

A detailed noise impact assessment has been prepared to detail the ambient background noise levels at potential sensitive receivers, the noise emissions that are predicted from the proposed facility and the potential impacts of the proposed development on sensitive receivers (Acoustics RB Pty Ltd, 2021).

It has been identified that the proposed facility will comply with noise limits during the 2021 crush season with regard to emissions at the nearby sensitive receivers.

4.5.2. INDIRECT IMPACTS

Noise related emissions from point sources can accumulate over time and create what is known as 'background creep'. Background creep is an accumulation of numerous noise related sources that over time increase the ambient noise levels in any given area. As per the Acoustics RB Pty Ltd noise assessment relevant criteria to minimise potential impacts from noise related emissions have been drawn from *Ecoaccess Guideline Noise – Planning for noise control*.

4.6. WASTE

The facility and associated production process will generate a variety of waste products including gases, waters and solids. The waste inventory from the process train includes:

- Cane cleaning effluent water (± 160 kg/hr).
- Cane trash and dirt (± 500 kg/hr).
- Bagasse (± 626 kg/hr).
- Mud and Fibre (± 38 kg/hr).
- Pasteurization Cooling water (± 600 kg/hr).
- Cooling Tower overflow and water vapor (± 750 kg/hr).
- Off specification product.

The waste streams identified in **bold** in the above list provide opportunity for re-use within the process train, thus, are not strictly waste products. These items are discussed further in **Section 5.7**.

Other general wastes likely to be generated from operation of the facility include;

- Spent cleaning agents (Sulphamic Acid and Sodium Hydroxide).
- Office waste.
- Laboratory chemical waste.
- Oils and fuels.
- Paper waste.
- Packaging waste.
- Litter.
- Putrescible food waste.

The various sources of waste-water identified above are considered as trade waste. Trade waste can only be disposed of via council infrastructure under a permit issued via council agreement.

It has also been identified that where cleaning agents (Sulphamic Acid and Sodium Hydroxide) utilized to sterilize food-graded process equipment cannot be recirculated or recycled disposal of diluted product will be required under a trade waste agreement.

4.6.1. DIRECT IMPACTS

The disposal of wastewater (trade waste) to council infrastructure may have substantial impacts on the operational viability of the Mossman wastewater treatment

plant. Uncontrolled trade waste released to the sewer system can negatively impact the biological processes within the treatment plant thus negatively affecting performance of the plant and requiring substantial resources to rectify. The flow on effect of this impact also has potential for council to breach their own licence with regard to uncontrolled releases to the environment.

In addition to the potential impact to microbial function of the plant, the volumes of potential trade waste released to council infrastructure may also exceed the known capacity of the plant and network in general.

4.7. TRANSPORT

4.7.1. ROAD

As access to the internal FNM mill rail network is not practical given the location of the facility, logistics movements at site will be via the Kid St entrance to Mossman Mill. The two (2) main access routes from the main road in Mossman are Williams Street, Ingless Street and Mill Street. All transport to and from site will be by road. Expected vehicle movements are listed below.

- Staff & visitor arrivals and departures via Kid St in cars (6am / 6pm).
- Multi-lift delivery of cane (3 deliveries a day).
- Semis delivering ingredients and consumables (1 every fortnight).
- Semis picking up drums of Kecap Manis for export (estimate 1 semi per day at full production).

- Company ute movements for picking up consumables and other minor tasks.

4.7.2. RAIL

Whilst rail networks are present within the existing mill operations, the proposed activity will not utilise them in any degree.

4.7.3. DIRECT IMPACTS

The slight increase to road usage associated with the activity is not expected to unduly affect functionality within the study area.

4.7.4. INDIRECT IMPACTS

No indirect impacts are anticipated.

4.8. CULTURAL HERITAGE

4.8.1. EUROPEAN

Mossman central mill is a place of local significance under Douglas planning scheme; however, the proposed location of the R&D facility is not known to be of cultural significance.

4.8.2. INDIGENOUS

Interrogation of the Aboriginal and Torres Strait Islander Cultural Heritage Database and Register indicates the subject site as being within an area designated as 'study area'. Given that the subject site is located within a previously disturbed area it is considered that indigenous cultural heritage significance of the site is in-determinate.

5. ENVIRONMENTAL MANAGEMENT REQUIREMENTS

With respect to the operational phase, the following Management Systems have been developed to adequately achieve the aims and objectives of this EMP, and to provide a framework for management of the identified environmental issues.

These management systems are achieved through the use and implementation of the following mechanisms:

1. Environmental Procedures.
2. Monitoring/inspection record data sheets; and
3. Auditing of the EMP requirements.

5.1. GENERAL ENVIRONMENTAL DUTY

A person must not carry out any activity that causes, or is likely to cause, environmental harm, unless the person takes all reasonable and practicable measures to prevent or minimise the harm (*"general environmental duty"*).

Refer **Environmental Procedure EP001** in Appendix One for further details.

5.2. AIR QUALITY AND DUST CONTROL

Detailed assessment and modelling of the potential air emissions of the facility has identified that all modelled gases and particulates emitted from the facility are below those emitted from the greater mill operations. As such, no specific management

strategies are required to mitigate potential impacts. However, all plant and machinery associated with the facility are to be regularly maintained to endure efficient operation.

Notwithstanding, during daily operations there is potential to create indirect impacts with dust due to vehicle movements and general site movements. While these are minor and have been anticipated within the modelling report, site management should consider the potential and appropriate actions undertaken to ensure adverse impacts are rectified.

Refer **Environmental Procedure EP002** in Appendix One for further detail.

5.3. NOISE

During operational activities potential for excessive noise impacts on adjoining properties and noise sensitive receivers are to be duly considered.

The findings of the Acoustic RB Pty Ltd report suggest that nuisance can be avoided, however, there remains the possibility that minor and intermittent exceedances of the noise level limits may occur on occasions during Phase 1. The report therefore recommends that operation of the new facility should be permitted up to the end of the 2021 crush without requiring that any supplementary noise control measures, notably acoustic barriers, be introduced into the current proposal due to the inability to accurately assess potential impacts in the absence of the dominant noise source in the area being the mill crushing activities (inactive at the time of assessment).

Upon commencement of the 2021 crush, but before completion of commissioning of the new facility, monitoring of current ambient and background noise levels in the

community should be undertaken to establish with a degree of accuracy the actual background noise levels to be used for setting limits for acceptable levels of noise emission from the facility during the crush.

In the event that these further determinations establish that non-compliance with the relevant noise level limits is occurring, or may occur on occasions, remedial measures should be evaluated so that appropriate noise control measures can be developed and implemented prior to the commencement of the 2022 crush.

In addition to the crushing noise emissions, noise level limits for commencement of Phase 2 operations, (i.e. the 2022 off-season), are to be set by reference to the ambient and background noise levels measured during the 2021 off-season. If required, appropriate noise control measures should be developed in order that successful operation of the proposed new facility may be conducted during the remainder of the 2022 off-season and thereafter.

As a general strategy to reduce any unexpected noise emissions not catered for within planning documents, all plant and equipment utilised are to be maintained and operated with the overall aim of reducing and minimising excessive noise emissions.

Refer **Environmental Procedure EP003** in Appendix One for further detail.

5.4. VEGETATION MANAGEMENT

The location of the proposed R&D facility is not identified with vegetation communities that will require specific management to prevent impacts. Areas of regulated vegetation located outside of the facility footprint but within the study area have been identified as potentially impacted sensitive receivers. To prevent indirect impacts to

vegetation communities associated with the study area the following management strategies are to be undertaken:

- Where individual trees are located within the area of operation, they are to be protected and retained. In the event that interference to trees may be required during operation of the facility, advice from an AQF level 5 arborist is to be obtained with the aim of maximizing retention possibilities.
- All stormwater and overland flow are to be directed to the greater mill stormwater management system for appropriate treatment prior to release to the environment.
- Trade wastewater is not to be released to the environment.
- Weed management strategies provided within this EMP are to be implemented with particular attention to appropriate disposal being paramount.

Refer **Environmental Procedure EP004** in Appendix One for further detail.

5.5. FAUNA MANAGEMENT

The habitat value of the site is generally located outside of the facility footprint in and around the boundaries of the greater mill operation. Notwithstanding the presence of conservation significant species has been identified within the area and as such, potential for occurrence of fauna within the subject site cannot be disregarded.

Contractors and operational staff are to be mindful of the potential for native fauna to be present within the facility footprint and are to take care to avoid harming fauna during site activities. To achieve the following actions are to be implemented.

1. Minimise unnecessary vegetation removal during construction and operations.
2. In the event trees require removal all clearing activities are to be undertaken in the presence of suitably qualified (authorised with appropriate permits under DEHP approval) Fauna Spotter Catcher Fauna pre-clearance and post-clearance requirements.
3. Ongoing daily fauna management. In the event that fauna is observed within the facility or facility grounds, removal and relocation is to be undertaken by a suitably qualified (authorised with appropriate permits under DEHP approval) Fauna Spotter Catcher

Refer **Environmental Procedure EP005** in Appendix One for further detail.

5.6. WATER MANAGEMENT

During the construction and operational phases of the facility the pollutants listed in **Table C** below may be potentially generated and mobilised within any given water flows.

Table C: Typical Operational Phase Pollutants

Pollutant	Source
Sediment	Exposed soils, inadequately managed stockpiles, mill mud
Rubbish/Litter	Paper waste, packaging, litter, cane off-cuts etc
Hydrocarbons	Spills of fuel and oil, leaks from machinery, equipment failure.
Toxic materials	Solvents, cleaning agents, wash down waters etc.
pH altering substances	Wash waters, cleaning agents

Appropriate measures are to be implemented during works to minimise potential negative impacts from these (but not limited to) pollutants. The following measures are to be implemented at a minimum.

Operational phase management of water related pollutants will include the following.

- Billet loading areas are to be appropriately bunded and equipped with appropriate water sensitive urban design measures such as (but not limited to) gross pollutant traps (GPT).
- Chemical storage in dedicated areas that are capable of containing chemical spills to a capacity beyond that of the total chemical storage capacity. All chemical storage areas are to be provided with spill kits.
- All stormwater flows are to be directed to the greater mill stormwater treatment system enabling monitoring of chemical parameters and treatment / disposal as required to achieve the outcomes of the *Environmental Protection (Water) Regulation* prior to release.

- Process wastewater is to be managed via the requirements of trade waste agreements/permits to be obtained as part of the development application.
- Spill containment kits are to be provided at appropriate locations within the facility.
- Any cleaning of vehicles and/or equipment associated with the facility is only to be undertaken within dedicated areas possessing adequate bunding and treatment devices (e.g. First Flush Systems, GPT). Where washdown of equipment using hazardous chemicals is required it is only to be undertaken where collection of wastewater can be achieved and directed to trade waste if required.

Additionally, trade waste agreements for liquid waste are to be established specifying minimum standards for release to council infrastructure. Where operation is required prior to establishment of trade waste agreements, storage of trade waste will be required in an appropriate manner until such a time where specified limits of disposal are established. In the event that appropriate storage cannot be achieved, plant shut down will be necessary.

Refer **Environmental Procedure EP008** in Appendix One for further detail.

5.7. SITE CONTROL / WASTE MANAGEMENT

Waste Management during operations represents a significant management issue during site operation. Waste streams from the process are to be managed in accordance with all relevant permit and licence requirements with the particular aim of reducing waste volumes to the maximal possible extent. Where accumulation of

waste is unavoidable management is to be undertaken in accordance with the waste management hierarchy provided below (DEHP, 2018).



Figure 4: Waste Management Hierarchy (Source: DEHP)

Waste re-use opportunities are to be maximised during operations. Potential re-use opportunities include:

- Cooling tower overflow water. Recycle and return to FNM mill process.
- Pasteurisation cooling water. Recycle and return to FNM mill process.
- Bagasse, mud and fibres. Reuse in FNM mill process.
- Cane trash and dirt. Return to cane farmer for field fertilisation.
- Boiler blowdown water return to process.
- RO brine water return to process.
- Process wash water return to process.
- Off specification product reprocessing.

Where trade wastes generated by the process cannot be re-used and require disposal, release/disposal will be managed under the framework of Environmentally Relevant Activity (ERA) permits issued under the administration of the DES.

ERA licence 28 (Sugar milling and refining) will be required and the conditions specified within these permits are always to be adhered to. All trade wastes are to be pre-treated in order to achieve the minimum standards specified within the associated permits. Additionally, trade waste agreements for liquid waste are to be established specifying minimum standards for release to council infrastructure. Where operation is required prior to establishment of trade waste agreements, storage of trade waste will be required in an appropriate manner until such a time where specified limits of disposal are established. In the event that appropriate storage cannot be achieved, plant shut down will be necessary.

Non-regulated waste streams are to be treated in accordance with the waste management hierarchy detailed in **Figure 4**. Recycling and industrial refuse bins are to be provided in dedicated adequately bunded, waste disposal areas located generally in accordance with the provided site plan. Where practicable these bins are to be of plastic construction to minimise noise pollution.

Stockpiling of cane billets is to be located within dedicated storage areas provided with appropriate bunding and GPT stormwater controls and away from areas potentially subject to overland flow. Storage limits are to be minimised to the greatest extent possible to prevent storage area overload. A maximum storage time/volume limit is to be established based on a maximum 12 hour (i.e. overnight) limit.

Excessive storage/stockpiling of solid waste produced under the process is to be minimised as far as practically possible prior to transportation to the greater mill mud stockpile. Storage locations for waste mud are to be located away from areas subject to excessive overland flow, be appropriately bunded and provided with stormwater controls to prevent release of contaminated leachate entering the environment. As a final control, all leachate from stormwater drainage will be directed to the greater mill stormwater control processes and be subject to release requirements under the FNM processes.

Refer **Environmental Procedure EP011** in Appendix A for further detail.

5.8. WEED AND PEST MANAGEMENT

Weed propagules and reproductive material may be transported into the facility areas via machinery and vehicles associated with the operation. Weed management of the facility area is to be conducted in accordance with the general procedures provided in **EP009** located in **Appendix One**.

Pursuant to the *Biosecurity Act 2014* it is an offence to release Category 3 and 4 restricted weed species in other areas and as such, it is the proponent's responsibility to ensure weed hygiene measures are enforced for all site activities. Refer **Environmental Procedure 009** in **Appendix One** for further details.

6. TRAINING REQUIREMENTS

The EMP Procedures are to be issued to relevant staff, agents or contractors as part of their site induction, and continuing training under the Contractor's Quality Assurance and Management Procedures. With respect to training of staff, agents and Contractors, the Procedures referenced above have been developed for direct issue to relevant staff, and/or incorporation by the principal into existing job-specific Task/Work Instructions, as part of existing Quality Assurance Procedures.

To ensure competency and knowledge is maintained through the business, CAPL shall:

- Develop and implement inductions, recruitment and ongoing training programmes to ensure that persons performing in specific roles have the necessary skills, knowledge, training or experience to perform competently in those roles.
- Inductions shall incorporate generalised content to provide awareness of the significant environmental aspects and impacts relevant to its activities and operations.
- Training and awareness programs will be developed and delivered to all persons performing tasks which have the potential to cause significant environmental impacts through toolbox meetings
- Programs will include training and awareness of the following topics:
- Significant environmental aspects and impacts of activities relevant to work areas and activities.

- Roles and responsibilities in achieving conformance; and the importance of conformance with the environmental policy, procedures and the EMS; and the consequences of departure from these.
- Environmentally relevant legal and compliance obligations and liabilities and the consequences for departure from these.
- New and or emerging environmental issues which impact on the organization.

7. COMPLIANCE AND MONITORING

7.1. SITE INSPECTIONS AND COMPLIANCE ASSESSMENT

The site manager and / or principal's representative are responsible for ensuring this EMP is complied with. Review of records and related documents demonstrating compliance with this EMP shall be completed at the time of inspection and provided to the administering authority in accordance with relevant license requirements.

7.2. MONITORING

The contractor is responsible for undertaking necessary site inspection and monitoring to demonstrate compliance with project environmental requirements (as stated in this EMP but not limited to) , as directed by the principal's environmental consultant and/or in accordance with relevant license requirements..

All monitoring activities are to be undertaken by a suitably qualified person.

All instruments, equipment and measuring devices must be calibrated, appropriately operated and maintained in accordance with the manufacturers specifications with records detailing such made available on request.

Any laboratory analyses and testing must be carried out by a NATA accredited laboratory.

All monitoring records must include:

- The date on which the sample was taken, or measurement was made.
- The time at which the sample was taken, or measurement was made; and
- The location at which the sample was taken, or measurement was made.

Additional monitoring requirements will be necessary in the event of emergency incidents (e.g. uncontrolled release of substance to environment).

Refer **Environmental Procedure 013** in Appendix One for details

8. RELATED DOCUMENTS

The principle is responsible for ensuring that all requirements relevant to operation of the facility outlined or included in the documents below are complied with at all times.

The principle is responsible for ensuring that its employees and sub-contractors understand the content and relevance of these documents.

The principal must ensure that works comply with the requirements outlined in the following documents:

- Acoustics RB Pty Ltd, 2021. Proposed Research and Technology Industry Facility 34 Mill Street, Mossman. Environmental Noise Assessment Report No. 21-1249.R01
- Vipac Engineers and Scientists Limited, 2021. CTP Mossman Sugar Mill AQ and noise assessment. Air Quality Assessment. 70B-20-0338-TRP-47306597-0 dated 26 March 2021.
- Environmental Authority EPPR00920713 issued to Far North Milling Pty Ltd.
- Far North Milling Pty Ltd, 2019. Stormwater Management Procedure. Doc number FNM-EV-0969.





ENVIRONMENTAL PROCEDURE EP001 – GENERAL ENVIRONMENTAL DUTY

Procedure – General Environmental Duty

Objective

- To comply with environmental duties pursuant to the Environmental Protection Act 1994.

Management Strategy

- Notwithstanding that which is written below, all persons associated with, or working on, the subject site are to familiarise themselves with their Environmental Duties under the EP Act. The following is a limited summary of the EP Act.
- A person must not carry out any activity that causes, or is likely to cause, environmental harm, unless the person takes all reasonable and practicable measures to prevent or minimise the harm ("general environmental duty").

Actions

- A person who, while carrying out an activity, becomes aware that serious, or material, environmental harm is caused (or potentially caused) by the person's, or someone else's, act or omission in carrying out the primary activity, or another activity being carried out in association with the activity.
- However, this does not apply if the harm is authorised to be caused under:
 - i) an environmental protection policy; or
 - ii) an environmental management program; or
 - iii) an environmental protection order; or
 - iv) an environmental authority; or
 - v) an emergency direction
- As soon as reasonably practicable after becoming aware of the event involving the harm, the person must if the person is carrying out the activity during the person's employment, or engagement by, or as the agent of, someone else (the "employer") –
 - i) tell the employer of the event, its nature and the circumstances in which it happened; or
 - ii) if the employer cannot be contacted - give written notice to the administering authority of the event, its nature and the circumstances in which it happened;
- Once the employer becomes aware of an event involving harm, the person must:
 - i) Give written notice to the administering authority of the event, its nature and the circumstances in which it happened;
- In accordance with the EP Act "Environment" includes:
 - i) ecosystems and their constituent parts including people, communities; and
 - ii) all natural and physical resources; and

Procedure – General Environmental Duty

- iii) the qualities and characteristics of locations, places and areas however large or small that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest amenity, harmony and sense of community; and
 - iv) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (i) to (iii).
- “Environmental Harm” is any adverse effect or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value. Environmental Harm may be caused by an activity;
 - i) Whether the harm is a direct or indirect result of the activity; or
 - ii) Whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

Performance Criteria / Indicators

- Environmental harm is not caused (or potentially caused) by the person’s, or someone else’s, act or omission in carrying out the primary activity, or another activity being carried out in association with the activity.
- All (if any) incidents resulting in environmental harm are dealt with in accordance with ‘Actions’ section of this Environmental Procedure.

Reporting / Responsibilities

- It is recommended that the person providing advice of an event causing environmental harm to record the details of the event and the details of the person(s) advised.
- The contractor is to maintain records of staff Induction and continuing training with reference to the above.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Contractor shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Contractor shall advise the Project Manager after completion of the corrective action.

Relevant contacts

Company	Role	Contact	Phone
Wolter Consulting Group	Environmental Consultant	Stephen Hayes	07 3666 5200
Coconutz Australia	Principle Contractor	Lucas van der Walt	0402213269
Department of Environment & Science	Significant Pollution Hotline	NA	1300 130 372

Procedure – General Environmental Duty

Douglas Shire Council	Minor pollution / Environmental Nuisance matters	NA	1800 026 318
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ENVIRONMENTAL PROCEDURE EP002 – AIR QUALITY CONTROL

Procedure – Air Quality Control

Objective

- To minimise the impact on air quality and residential amenity during the operational phase

Management Strategy

- To comply with the *Environmental Protection Act 1994*, it's subordinate *Environmental Protection (Air) Policy 2008*, Local Authority Local Laws and Occupational Health and Safety requirements.
- To minimise reduction of air quality due to the creation of airborne dust and vehicle/chemical emissions to within acceptable limits.
- To achieve no visible dust emissions at the subject site boundary caused by earthworks and construction activities.

Actions

Emission Type - Fumes

- All equipment shall be efficient, operated in accordance with established operating procedures and maintained to minimise exhaust emissions. Engines shall not be left to idle without adequate reasoning.
- All vehicles and plant shall be properly maintained to ensure that emission levels are less than the limits defined by relevant administering authorities and associated Australian Design Rules.

Emission Type - Odours

- All materials and/or processes that generate fumes or odours shall be properly stored and/or used with efficient and appropriate equipment for the scale of the activity.

Emission Type - Dust

1. Dust Control – General Actions:

- Dust control measures are to be implemented wherever a site activity contributes to atmospheric dust concentrations.
- Windbreak screens shall be considered when necessary between dust sources and adjoining sensitive receivers.
- Emissions of dust and/or particulate matter resulting from the work-related activities that may cause an environmental nuisance must not be released beyond the boundaries of the subject site.
- Work related activities must be managed using all reasonable and practical measures to minimise the release of windblown dust to the atmosphere. Reasonable and practicable measures may include (but are not limited to):
 - i) Restriction of vehicular movements within the site to designated access routes;
 - ii) Minimisation of exposed surfaces to that within the current operational area;
 - iii) Rehabilitation and stabilisation of work areas identified as dust point sources;
 - iv) Transfer of materials whilst wet or moist;

Procedure – Air Quality Control

- v) Sealing of trafficable areas

2. Dust Control – Stockpiles

- Stockpiles must be maintained using all reasonable and practical measures to minimise the release of windblown dust to the atmosphere. Reasonable and practicable measures may include (but are not limited to):
 - i) Operation of effective water spray systems during winds likely to generate a nuisance toward neighbouring sensitive receivers.
 - ii) Use of dust suppressant shielding.
 - iii) Orientation of stockpiles with respect to the direction of prevailing winds.
 - iv) Use of bunkers and/or tarpaulins to reduce entrainment.
 - v) Minimisation of stockpile sizes and stabilisation of stockpiles where anticipated to be in place for extended periods (seeding or mulching).
 - vi) Minimise the number of stockpiles required as far as practicable.
 - vii) Removal of surplus material as a preference to stockpiling.

3. Dust Control – Trafficable Areas

- Trafficable areas must be maintained using all reasonable and practical measures to minimise the release of windblown dust to the atmosphere. Reasonable and practicable measures may include (but are not limited to):
 - i) Trafficable surfaces to be kept clean and free of dirt as far as practicably possible.
 - ii) Sealing of trafficable surfaces.
 - iii) Use of water carts to douse trafficable surfaces regularly when conditions require.
 - iv) Reduction and enforcement of site speed restrictions; and
 - v) Using dust suppressants and wind breaks.
- Spills of materials onto sealed areas as a result of delivery or handling must be cleaned/rectified as soon as practicable.
- Restrict traffic movement from areas that are not designated as haul routes / site access.
- Loss of spoils from transport trucks is to be prevented via the use of trailer tarpaulin at all times.

Performance Criteria / Indicators

- Weekly inspections by Principal Contractor (PC) of control measures in place and relative effectiveness of control measures.
- PC to maintain weekly averages of wind speed, direction and rainfall.
- Records of complaints received and associated investigation and corrective actions. Where more than three (3) complaints are received from the same or similar location the PC will implement air quality monitoring to quantitatively measure concentrations at the point of complaint. Corrective actions are to be implemented where the limits provided in the table below are exceeded.

Procedure – Air Quality Control

Air Quality Objectives as per *Environmental Protection (Air) Policy 2008*

Parameter	Maximum Concentration
Annual, 24hr averaged dust concentration as total suspended particulate	90µg/m3
Annual, 24hr averaged dust concentration as PM10	50µg/m3
24hr averaged dust concentration as PM10	150µg/m3
Visibility	20km

Reporting / Responsibilities

- The site manager will be responsible to manage complaints. The site manager will be responsible for relevant forms to be completed and any implementing any actions identified
- The site manager shall submit monthly reports to the Principal summarising monitoring activities, control measures and corrective actions required.
- Non-conformance with this plan shall be recorded and a Corrective Action Request (CAR) issued. All CAR's shall be included in the Non-conformance register.
- The Site manager shall implement corrective actions.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP003 – NOISE CONTROL

Procedure – Noise Control

Objective

- To control noise generated by the activity thus minimising the impact of noise to acceptable levels of amenity to adjoin sensitive receptors

Management Strategy

- To comply with the Environmental Protection Act 1994, it's subordinate Environmental Protection (Noise) Policy 2008, Local Authority Local Laws and Occupational Health and Safety requirements.
- To notify adjoining sensitive receptors if and when excessive noise is expected.

Actions

- Contractor to establish Noise Control strategies to minimise noise levels.
- Control strategies include (but are not limited to)
 - The fitting of exhaust silencers to all mobile plant;
 - Use of exhaust silencers on compressed air machinery;
 - The fitting of engine acoustic shields;
 - The use of physical noise barriers;
 - Review of allowable hours when using noise excessive plant and equipment;
 - Review of working hours.
- Lighting devices to be used in preference of noise emitters to control site operations (excepting for safety warnings).
- All vehicles operating on site shall comply with noise limitations detailed in the Federal Office of Road Safety Australian Design Rule ADR28/01-External Noise of Motor Vehicles
- Reversing alarms fitted to vehicles are to be of 'squawker' design as a preference over 'beeper' design.
- Working hours on site shall comply with relevant local and state laws and guidelines. The table below provides time restrictions detailed in Department of Transport and Main Roads Transport Noise Management Code of Practice Volume 2 – Construction Noise and Vibration.

Work Periods for Construction Activities

Work Period	General Construction & Construction Traffic
Standard Hours	Monday to Friday 7:00am to 6:00pm
	Saturday 8:00am to 1:00pm
Non-Standard Hours – day/evening	Monday to Friday 6:00pm to 10:00pm
	Saturday 1:00pm to 10:00pm
	Sunday 7:00am to 10:00pm

Procedure – Noise Control

Non-Standard Hours – night time	Monday to Sunday 10:00pm to 7:00am
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Performance Criteria / Indicators

- The contractor shall perform weekly inspections of all noise and vibration producing sources to assess compliance of noise control measures.
- Where complaints regarding noise are received, the Project Manager and Contractor will attend the complainant's locality during the noise emitting activity to ascertain what control measures may be required and the validity of the complaint.
- In the event of a dispute an independent party (such as the Consultant) shall undertake a noise monitoring / vibration assessment.
- The contractor is to keep written record of all complaints, monitoring results and corrective actions.
- Criteria for noise complaints are to conform with the Acoustic Quality Objectives specified pursuant to the *Environmental Protection (Noise) Policy 2008* and the extracted table below (*Department of Transport and Main Roads Transport Noise Management Code of Practice Volume 2 – Construction Noise and Vibration.*)
- Persons affected by the noise shall be consulted with regard to suitable noise emission hours and advised of the agreed operations schedule

Table 3.2.1.1(a) External Construction Noise Criteria

Work Period		External Noise Level dB(A) $L_{Aeq,adj,15min}$	
		Lower Limit	Upper Limit
Standard Hours		RBL + 10	75 Where: RBL >55
			70 Where: 40 <RBL ≤55
			65 Where: RBL ≤40
Non -Standard Hours	Evening	RBL + 5	RBL + 5
	Night Time		

Where RBL = the pre-construction Rating Background Level

For further detail Refer *Department of Transport and Main Roads Transport Noise Management Code of Practice Volume 2 – Construction Noise and Vibration.*

Reporting / Responsibilities

Procedure – Noise Control

- The contractor shall perform weekly inspections of all noise and vibration producing sources to assess compliance of noise control measures.
- The Contractor shall submit monthly reports to the Project Manager summarising monitoring activities, control measures and corrective actions required.
- Non-conformance with this plan shall be recorded and a Corrective Action Request (CAR) issued. All CAR's shall be included in the Non-conformance register.
- The Contractor shall implement corrective actions.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Contractor shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Contractor shall advise the Project Manager after completion of the corrective action.

ENVIRONMENTAL PROCEDURE EP004 – VEGETATION MANAGEMENT

Procedure – Vegetation Management

Objective

- To protect native vegetation, and to minimise the environmental impact of vegetation clearing activities on the preserved vegetation.
- To protect fauna from impacts resulting directly from the clearing of vegetation.
- To clear vegetation in a way which minimises harm to native fauna and allows for escape into neighbouring vegetation communities.

Management Strategy

- Maximise the retention of existing native vegetation, as far as is practicable and comply with the requirements of Local, State and Commonwealth Laws for Vegetation Management.
- Ensure native fauna that inhabit the vegetation to be cleared are protected as far as practicable.
- Vegetation to be preserved is to be clearly identified to prevent damage or disturbance.
- Construct protective fence where individual trees may be impacted by site activities.
- If native trees are identified within the clearance zone that may be retained with minor, practical modifications to the activity, such modifications shall be implemented, and the trees protected with fences and/or trunk girdles.
- Restricted weeds (Biosecurity Act 2014) shall be eradicated by nominated weed strategies.
- If mature trees (any tree having a diameter at the base greater than 150mm) are damaged that are not scheduled for clearance, steps shall be undertaken to re-establish the tree if possible, and to carry out relevant rehabilitation works if required.
- If disposal methods are not compliant with Local Authority Guidelines, necessary changes shall be made to correct the disposal procedures

Actions

- Individual trees identified are to be protected by a 1.2m (3 wire) high fence to be constructed within 500mm of any construction activity and are to include as much of the Primary Root Zone as is practicable.
- The Contractor shall provide temporary fences and/or trunk girdles (as described above) to prevent unintended physical damage to the root system, trunk or canopy of native vegetation identified for retention.
- All trees to be lopped or felled shall first be checked for wildlife (eg Koalas, Possums, and Cockatoos). If any wildlife is present, the tree shall not be lopped until the animal has left the tree. Refer Fauna Management Procedure EP005.
- All vegetation to be retained should be healthy and vigorous, with an expected lifespan of at least fifty (50) years. All individual trees and stands of vegetation will be subject to a risk assessment by a qualified Arborist if necessary.

Procedure – Vegetation Management

- Compaction around tree bases by heavy machinery is to be avoided where practicable. Vehicles should not drive or park under tree drip-lines. Stockpiling should not occur under drip-lines. Should work need to be undertaken under the drip-line, time / traffic should be limited, and a mulch layer (10cm depth) or a sufficient soil buffer should be used.
- Temporary protective measures, such as distinctive safety fencing around root zones of large trees will be used where necessary and practicable during construction activities.
- All imported fill material (if required during the construction or operational phases) is to be clean and free of vegetative matter.

Performance Criteria / Indicators

- No protected vegetation or trees are cleared or damaged
- Imported fill is visibly clear of vegetative matter

Reporting / Responsibilities

- The Site manager is responsible for monitoring, control measures and corrective actions.
- The Site manager shall implement corrective actions.

Corrective Action

- In the event that protected vegetation is cleared or damaged without prior approval, the Site manager shall advise the principle.
- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP005 – FAUNA MANAGEMENT

Procedure – Fauna Management

Objective

- To minimise the potential for site activities to cause damage to native fauna that may occur within the facility
- To identify the actions that are to be undertaken on any part of the subject site during clearing activities
- To provide the required scope of works of a suitably qualified Fauna Spotter/Catcher.

Management Strategy

- Minimise risk of harm to resident native fauna to within acceptable limits.
- Minimise the risk of injury/mortality of fauna within the limitations of Occupational Health and Safety (OH&S) Guidelines

Actions

- A DEHP Suitably Qualified Spotter-Catcher will be required during all tree removal works.
- Immediately after a tree is felled the Spotter-Catcher will thoroughly inspect each hollow (if present) for the presence of fauna. The Spotter-Catcher will utilise a torch to aid in this inspection and the mechanical manipulation and modification of some hollows may be required to ensure a thorough inspection is completed. All animals will be captured and removed from the hollows, monitored and relocated off site.
- Wood debris or other material stockpiles may need to be moved, mulched or otherwise disposed of during the course of daily operations. Due to the inherent habitat value of these features, a thorough inspection of each debris stockpile by the Spotter-Catcher on site is recommended prior to the movement or modification to ensure no fauna are injured. The Spotter-Catcher on site will determine the extent of inspection required dependent on the size, location and composition of the individual stockpiles
- Due to the threat and spread of Chytridiomycosis (*Batrachochytrium dendrobatidis*) throughout the native frog population of Australia, all frog handling and management is conducted in a manner to restrict the spread of this disease. All amphibians are handled wearing disposable gloves and held in individual bags when not captured in the same location. Frogs are kept moist until they can be released to avoid dehydration. Frogs are released in areas of moist substrate preferably adjacent to an established waterbody.
- All terrestrial fauna captured on site will be placed in clean calico catch bags until a suitable release time and location are found. These animals will be placed in a cool quiet place away from clearing activity and regularly monitored for signs of stress or injury. All healthy fauna will be relocated into the areas of similar vegetation composition to their natural habitat preferences.
- Detailed records will be made by the Spotter-Catcher with regard to all fauna interactions that occur onsite. The following details are recorded for each animal encountered;
 - a. Species
 - b. Age and Sex (if known)
 - c. Health status

Procedure – Fauna Management

- d. Time, Date and Location of interaction
- e. Release location and time
- f. Outcome of interaction
- g. Additional notes and comments

These records are to be maintained in a database by the site manager.

- In the event that Koala are located in trees to be felled, all works are to be ceased and not to re-commence until such a time that the individual has moved of its own accord.

Performance Criteria / Indicators

- All wildlife occurring in area to be cleared is removed and relocated by a suitably qualified Fauna Spotter/Catcher.
- No fauna in the area to be cleared is harmed as a result of site activities.
- Interaction reports are provided to the principal by the suitably qualified person (i.e. Fauna Spotter/Catcher).

Reporting / Responsibilities

- The Site manager is to keep records of death/injury of animals resulting from operation of the development.
- If an injury to wildlife occurs the Site manager must record all details and inform DES in their specified “return of operations” reporting period or in accordance with their permit conditions.

Corrective Action

- In the event that trees are cleared not supervised by the fauna spotter/catcher, the Site manager shall advise the Principal
- Non-conformance with this plan shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP008 – STORMWATER QUALITY

Procedure – STORMWATER QUALITY

Objective

- To minimise the impact of activities on water quality in water bodies, external to the site, to within acceptable limits

Management Strategy

- To avoid detrimental impact on water quality and the aquatic environment of downstream water bodies as a result of discharge of uncontrolled, contaminated stormwater runoff from the site.
- To comply with the *Environmental Protection Act 1994* and the subordinate *Environment Protection (Water) Policy 2009*
- To undertake a water quality monitoring program

Actions

- Materials stockpiles stored on site shall be located in a suitably prepared location so as to limit the potential for suspended solids to be entrained and transported from the site. Existing overland flow pathways are to be diverted from laydown/storage areas and bunds/fences shall be provided to retain material within the designated storage location.
- Fuels and oils shall be stored in safe locations (bundeds as required by relevant standards and guidelines) where stormwater inundation is likely to occur.
- All spills are to be cleaned and rectified immediately to prevent transport via overland flow.
- All stormwater and overland flow is to be directed into the FNM mill stormwater management system for appropriate monitoring and treatment (where required) in accordance with the FNM stormwater management procedure FNM-EV-0969
- Stockpile and waste disposal areas are to be provided with suitable bunding and stormwater treatment measures to reduce excessive loads on the mill treatment systems.
- Pursuant to the *Environmental Protection (Water) Policy 2009* the Principal (or representative) will not deposit or release any of the following into, or in a place where it is likely to wash into a waterway, a roadside gutter or a stormwater drain:
 - a. Sand
 - b. Silt
 - c. Mud
 - d. Rubbish
 - e. Building Waste
 - f. Sawdust
 - g. Waste Water
 - h. Cement / Concrete

Procedure – STORMWATER QUALITY

- i. Solvents
- j. Oils / fuels
- k. Insecticides
- l. Herbicides
- m. Fungicides or biocides

Performance Criteria / Indicators

- Stormwater quality control infrastructure and mechanisms are to be monitored by the Site manager to ensure satisfactory performance weekly after major rainfall events.
- No water is to be released from site without conformation that site specific water quality parameters have been achieved.
- In the absence of site specific Water Quality Objectives, relevant water quality objectives defined under the Environment Protection (Water) Policy 2009 are to be adopted.

Reporting / Responsibilities

- It is the principals (or principals' representative) responsibility to liaise with Far North Milling to ensure stormwater management procedures are effective.
- It is the principals (or principals' representative) responsibility to liaise with Far North Milling to ensure stormwater monitoring is conducted and that all releases to the environment can continue to achieve the requirements of the FNM Environmental Authority release criteria with additional loads from the facility.
- Stormwater Quality control infrastructure and mechanisms are to be monitored on a daily basis by the Site manager to ensure satisfactory performance and immediately after rainfall events
- The Site manager is to provide monthly reports on monitoring events to the Principal including all corrective actions taken to achieve the performance criteria.
- Non-conformance with this plan shall be recorded and a Corrective Action Request (CAR) issued. All CAR's shall be included in the Non-conformance register.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP009 – WEED MANAGEMENT

Procedure – Weed Management

Objective

- To comply with legal obligations pursuant to the *Biosecurity Act 2014*;
- To prevent the spread of *Prohibited* and *Restricted* weed species as a result of site activities.

Management Strategy

- Removal and ongoing control of weed species.
- Compliance with the *Biosecurity Act 2014*.
- Compliance with Local Authority Laws, policies and guidelines relevant to the control of weed species.

Actions

- Identify existing weed distribution and density on the site.
- Design a staged weed eradication program that forms a part of ongoing site management strategies.
- Regularly inspect the site to identify and control weed species.
- Implementation of weed management strategies must adhere to the following guidelines:
 - Reduce the extent of disturbed areas associated with the facility. Disturbed areas encourage weed germination.
 - Weed management to be undertaken in three stages, Primary Control, Follow-up Control and On-going Maintenance
 - Treatment of infestations to use appropriate methods of manual, mechanical or chemical control (refer below)
 - Weed Hygiene measures are to be implemented where *Prohibited* or *Restricted* weed species are identified on-site.
 - Weed management and associated works is to be undertaken utilising advice from a trained, experienced contractor with suitable qualifications (i.e. current holder of **Ground Distribution Contractors Licence and Agricultural Chemical Distribution Certificate (ACDC)**).
 - All companies involved with the distribution of herbicides must hold a current **Commercial Operators Licence** issued under the *Agricultural Chemicals Distribution Control Act 1966*
- Weed control methodology is to comply with the implementation of the methods described in the table below:

Weed Control Methods

Manual Methods

Name	Description
------	-------------

Procedure – Weed Management

Hand Removal	Appropriate for small numbers of plants in isolated areas. Low impact method. Weed is manually pulled from the soil or where a deep tap root is present a trowel or knife can be used to loosen soil enabling removal of the entire plant. Bag and remove from site.
Crowning	Used on weeds with growth points located at or below ground level (e.g. <i>Asparagus spp.</i>). Above ground components of the plant are trimmed at near to ground level. A knife (or similar) is then inserted close to the base of the plant at an angle ensuring the knife tip is well under the root system. Roots are then severed close to the base of the plant. The crown must be removed from site and disposed of in an appropriate manner.
Mechanical Methods	
Name	Description
Brushcutting	Use of brush cutters to reduce the dominance of larger areas of herbaceous species and grasses. Chemical treatment can be used in association (prior to brush cutting or during active regrowth stage).
Chainsaw	Use of chainsaw to fell species that can then be chemically treated to reduce regrowth potential.
Slashing	Slashing and mowing to reduce weed growth and restrict flowering at critical weed lifecycle periods
Mulching	Mulching and smothering using large and small machinery specifically designed to mulch trees and woody vegetation in-situ. The use of the mulch on-site can assist in suppressing weed growth but should be utilised cautiously as some weed species have characteristic propagative capabilities where vegetative germination is possible.
Blade Ploughing	The use of a dozer blade to push over woody weeds and destroy root systems. Should only be utilised where sensitive weeds removal techniques are not required.
Chemical Methods	
Name	Description
Cut / Paint (Cut/Stump)	Preferred method for woody weeds, trees and some vines (e.g. groundsel, Camphor Laurel). The plant trunk is cut horizontally near to ground level with herbicide applied immediately to the exposed internal structures with a spray bottle or paint brush. Can be utilised during periods of light rain where spray methods are rendered useless.
Frilling	Appropriate for tree sized woody weeds (<100mm diameter). An axe or chainsaw is used to slice sections of the trunk at 100mm intervals around the entire circumference of the tree. These incisions are made at an angle of approx. 45 degrees ensuring the Cambrian layer is not exceeded with the incision. Herbicide (neat or 2:1) is then painted or sprayed into the hole within 7 seconds of the wound being made. Utilise only where public safety issues or not relevant as treated tree specimens are likely to drop branches as the tree dies.
Scrape / Paint	Similar to cut/stump but more useful on vine species particularly where it is necessary or preferable to retain the vine structure intact (e.g. aerial tubers on Madeira vine). Propagules are initially removed (where appropriate) before scraping the plant tissue away on one side of the stem for up to 100cm before leaving a small

Procedure – Weed Management

	gap and repeating on the other side of the stem. Undiluted herbicide is then applied to the exposed xylem tissue within 7 seconds of exposure.
Spot/Foliar Spray	Low volume distribution of herbicide via the use of knapsack or hand held pneumatic spray packs (can include 12V battery operated ute/quad mounted units). Appropriate for a wide range of herbaceous weed species. Less efficient when dealing with high abundance woody weeds.
Splatter Gun/Gas Gun	Utilises a gas gun (fan shaped nozzle = Gas Gun Treatment and Nozzle delivering solid stream of large droplets = Splatter Gun) to treat hard to access or high abundance areas of herbaceous and/or woody weeds. Applies a low volume of concentrated herbicide to the target species reaching potential distances of up to 10m away. Non-target damage is minimised given the high concentration and minimal contact area required to treat target species. Particularly effective on large Lantana thickets. Gas gun method (i.e. Fan shaped nozzle providing uniform coverage of 4-5m ²) is utilised in areas where water access is limited and is generally useful for smaller isolated weed occurrences.
Stem Inject	Applies to all larger woody weeds and trees (greater than 100mm trunk diameter). A battery powered drill is used to excavate a hole placed at an angle of approximately 45 degrees into the xylem tissue of the trunk. Care must be taken to ensure the hole is located within the xylem and not into deadwood in the centre of the trunk. Herbicide (neat or 2:1) is then injected directly into the hole within 7 seconds. This process is repeated around the entire circumference of the trunk at approximately 100mm intervals. Utilise only where public safety issues or not relevant as treated tree specimens are likely to drop branches as the tree dies.
High Volume Foliar Distribution	Distribution of chemical mix (generally low concentration) via the use of petrol driven pump, tank, retractable hose and hand gun under high pressure. Effective for where large areas of treatment are required. An additional benefit is that units can be mounted on 4WD or other vehicles to enable access to remote locations or where access to water may be limited (i.e. chemical mix can be prepared and transported to site).
Over spray method	Useful where large dense infestations of weeds species occur. Herbicide is sprayed over the top of the infestation canopy at recommended rates using the weed canopy as shelter for regenerating plants underneath. Sprayed plants are left intact to prevent erosion, protect native seedlings, retain habitat and discourage human access.
Basal Barking	Herbicide is mixed with Diesel to assist bark penetration. The herbicide mix is sprayed onto the trunk to a height of 30cm and for the entire circumference of the target specimen. Do not utilise this method where the bark is corky, wet or charred.

- The use of herbicides and associated chemicals on the site must adhere to manufacturers specifications and associated label directions or under the permit prescriptions when utilised under an *Off-Label* permit as issued under the *Agricultural Chemicals Distribution Control Act 1966*.
- Regular monitoring (monthly intervals) of the site for new infestations of weeds is to be implemented.

Procedure – Weed Management

Performance Criteria / Indicators

- The site is 100% free (and persists as so) of all Prohibited and Restricted weeds pursuant to the Biosecurity Act 2014.
- Monitoring indicates no new infestations of Prohibited and Restricted weeds pursuant to the Biosecurity Act 2014

Reporting / Responsibilities

- The Site manager is responsible for monitoring, control measures and corrective actions.
- The Site manager shall implement corrective actions.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP011 – WASTE MANAGEMENT

Procedure – Waste Management

Objective

- To maintain the site in a manner so that potential for environmental nuisance or harm is minimised to within acceptable limits.
- To store and handle hazardous wastes in an appropriate manner.

Management Strategy

- The facility to be maintained in a safe and tidy condition
- Compliance with relevant Local Authority Policies and Local Laws including Councils Trade Waste Policy

Actions

Plant and Equipment Management

- The Contractor is to:
 - Maintain and operate all plant and equipment in a suitable and efficient condition;
 - Dispose of waste products in a suitable and efficient manner
- “Plant and equipment” refers to:
 - Any plant and equipment used to prevent and / or minimise the likelihood of environmental harm being caused;
 - Any devices and structures to contain foreseeable escapes of contaminants and waste;
 - Any vehicles used to transport waste;
 - Any device or structure used to store, handle, treat or dispose of waste; and
 - Any monitoring equipment and associated alarms.

Litter and Waste Control Plan

- Within the facility, the Site manager shall establish a Litter and Waste Control Plan. This will detail management of the collection, storage and removal of all litter and waste on the site.
 - Listed in order of preference, manage work in accordance with the following principles: Avoid, Reduce, Reuse, Recycle, Waste- to-Energy (WTE) Recovery and Landfill.
- All Litter and waste, including pre-existing materials, construction wastes, human waste, used oils and any other surplus materials shall not be disposed of, nor burnt, on site.
- Trade wastes are to be handled and disposed of in accordance with the requirements of Douglas Shire Council’s relevant trade waste permit issued to the facility; and
- The site is to be kept free from all wastes, especially those that may be exported from the site via wind or water.

Waste Storage

Procedure – Waste Management

- Specific areas shall be set aside for the storage of construction materials. In particular, a safe storage location for fuels, oils, solvents and other dangerous goods utilised in the production process shall be provided in accordance with NOHSC 2017 (2001) "Storage and Handling of Workplace Dangerous Goods". This area shall be banded in compliance with the Code of Practice and relevant authority requirements.
- Waste storage areas, or bins, are to be provided for the storage of waste materials including construction waste, builders waste and vegetation waste.
- All hazardous wastes shall be stored and disposed in accordance with the Safety Data Sheet (SDS).
- All hazardous material SDS's shall be kept on site at all times; and
- An emergency response plan will be prepared, and site personnel inducted in its application. Spill response equipment and protective clothing is to be kept on site at all times.

Waste Disposal

- Wastes (excluding hazardous wastes) generated during construction, and from the proposed use of the site, may be disposed of to an approved waste disposal facility either directly or via an approved waste receptacle and collection service.
- All hazardous waste will be disposed in accordance with the relevant SDS.
- Under no circumstances shall fires be lit for the disposal of solid waste refuse or waste be used as fill or buried on site.
- Should an alternate disposal method be proposed, council approval will be required before implementation begins.
- Where practical, operations that produce waste are to be avoided, reduced, re-used or recycled.

Performance Criteria / Indicators

- Weekly inspections by Site manager to verify compliance with the site-based Litter and Waste Control Plan once established.
- The facility operations will be monitored and have details recorded pertaining to work areas, fencing, storage locations, access roads and disposal methods. If altered at any time all associated plans will be altered accordingly.

Reporting / Responsibilities

- The Site manager shall submit monthly reports to the Principal summarising monitoring activities, control measures and corrective actions required.
- Non-conformance with this plan shall be recorded and a Corrective Action Request (CAR) issued. All CAR's shall be included in the Non-Conformance Register.
- The Site manager shall implement corrective actions.

Corrective Action

Procedure – Waste Management

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Princippal after completion of the corrective action.



ENVIRONMENTAL PROCEDURE EP013 – MONITORING, RECORDING AND NOTIFICATION

Procedure – Monitoring, Recording and Notification

Objective

- To regulate response protocols to incidents and emergencies during the life of the project.
- To mitigate and reduce environmental impacts of emergencies and incidents.

Management Strategy

- The site to be maintained in a safe and tidy condition.
- Compliance with all relevant operational procedures, Local Authority requirements and government guidelines.

Actions

Rainfall Induced Contaminant Releases

- All complaints received by the Site manager relating to releases of contaminants from operations at the site must be recorded and kept in a log with the following details:
 - Time, date and nature of complaint.
 - Type of communication (telephone, letter, personal etc.).
 - Name, contact and contact telephone number of complainant (Note: if the complainant wishes to remain anonymous, record as "Not Identified").
 - Response and investigation undertaken as a result of the complaint.
 - Name and qualification of person responsible for investigating complaint; and
 - Action taken as a result of the complaint investigation and signature of responsible person.
- The Complaint Record must be maintained for no less than three (3) years.

Incident Recording

- A record of events must be maintained. These events include, but are not limited to:
 - Any fire at the site.
 - Any release of leachate or stormwater runoff which has been in contact with any raw materials, wastes and contaminants used for, and / or resulting from, carrying out any activity on the licensed place to the receiving waters. This includes releases from the system managed by FNM.
 - Detection by the environmental monitoring program of any release of contaminants not likely to be in accordance with the conditions of this environmental authority; and
 - Incidents which have adverse public health consequences and / or cause nuisance (include time, date, duration and nature of incident).

Procedure – Monitoring, Recording and Notification

Emergency and Incident Notification

- As soon as practicable after becoming aware of any emergency or incident which results in the release of contaminants not in accordance with the conditions of this environmental authority. The holder of the environmental authority must notify the Administering Authority of the release by telephone and email.
- The notification of emergencies or incidents as required above must include, but are not limited to:
 - i. The location of the emergency or incident.
 - ii. The name and telephone number of the designated contact person.
 - iii. The time of the incident.
 - iv. The time the incident was discovered.
 - v. The suspected cause of the incident.
 - vi. The environmental harm and / or environmental nuisance, caused threatened or suspected to be caused by the incident.
 - vii. Actions taken to prevent any further relapse and mitigate any environmental harm, and / or environmental nuisance caused by the release.
- Not more than 14 days following the initial notification of an emergency or incident, the holder of the environmental authority must provide written advice of the information in accordance with the above, in addition to:
 - i. Proposed actions to prevent a recurrence of the emergency or incident.
 - ii. Outcomes of actions taken at the time to prevent or minimise environmental harm and / or environmental nuisance; and
 - iii. The results of any environmental monitoring performed.

Water Quality Determinations

- All determinations of the quality of contaminates released to waters must be made in accordance with method prescribed in Queensland Government's "Monitoring and Sampling Manual 2018", published by Department of Environment and Science, or more recent editions or supplements to that document as such become available.
- All determinations of the quality of contaminants released must be performed by a person, or body, possessing appropriate experience and training to perform the required measurements.
- All stormwater management infrastructure (under control of the Principal) must be inspected following every rainfall event. In addition, to ensure the integrity of the works, monthly inspections must be undertaken during dry weather periods. Inspection dates observed condition of control works and any corrective measures completed must be recorded.
- The records required above must include:
 - i. Dates of rainfall events.
 - ii. Rainfall in millimetres.

Procedure – Monitoring, Recording and Notification

- iii. Application of any flocculate or any other substance to any sedimentation pond or equivalent; and
- iv. The results of site and equipment inspections and corrective measures undertaken.

Noise Monitoring

- When investigating any complaint of intrusive noise and for checking compliance with the *Australian Standard AS2436 "Guide to noise and vibration control on construction, demolition and maintenance sites"* (2010). Monitoring of noise levels from the environmentally relevant activities must be undertaken during construction activities for the following descriptors, characteristics and conditions:
 - i. L_{Amax}, adj T;
 - ii. L_{A90}, T;
 - iii. L_{AN}, T (Where N equals statistical levels of 1, 10, 50, 90 and 99);
 - iv. L_{Aeq};
 - v. The level and frequency of occurrence of impulsive or tonal noise measured.
 - vi. Atmospheric conditions including temperature, relative humidity and wind speed and direction.
 - vii. Effects due to extraneous factors, such as traffic noise; and
 - viii. Location, date and time of recording.
- Noise monitoring must be undertaken to investigate any complaint of noise nuisance upon receipt of a request from the administering authority to carry out such monitoring.
- The measurement and reporting of noise levels must be undertaken by a person or body possessing appropriate experience and qualification to perform the required measurements.
- The method of measurement and reporting of noise levels must comply with the Department of Environment and Heritage Protection *"Noise Measurement Manual"* Version 4, August 2013, or more recent additions or supplements to that document as they become available.

Ambient Particulate Monitoring

- Ensure compliance with the environmental procedure- *"Air Quality Control"*, and in order to investigate a complaint about dust that the administering authority considers as more than vexatious and constitutes an unreasonable release, than at the written request of the administering authority, the Contractor must develop and implement a particulate monitoring program.
- The particulate monitoring program must have provisions for (as relevant):
 - i. Monitoring of ambient particulate matter (insoluble analysis and particulate matter deposition rate in milligrams / square metre / day) at no less than two (2) locations sited at approximate even spacing around the licensed place in the proximity of an affected dust sensitive place. To investigate any complaint alleging dust nuisance that is reasonably likely to have emanated from the licensed place, upon receipt of written request from administering authority, monitoring must be conducted over a period of at least three consecutive thirty (30) day periods; and

Procedure – Monitoring, Recording and Notification

- ii. To investigate any complaint alleging that an environmental nuisance is caused by dust and particulate matter that is reasonably likely to have emanated from the licensed place, upon receipt of written request from the administering authority to carry out such monitoring. Monitoring of the 24-hour concentration average of particulate matter with an aerodynamic diameter less than 10 micrometre (μm) (PM10) suspended in the atmosphere downwind and beyond the boundary of the licensed place. The average concentration must be calculated from a minimum of eight (8) samples obtained over a one (1) month period.
- Samples taken for the particulate monitoring program must be collected and analysed in accordance with the requirements of the Department of Environment “*Air Quality Sampling Manual*”, first edition, November 1997, or more recent editions or supplements to that document as published by the Environmental Protection Agency.
- All determinations of particulate monitoring must be performed by a person or body possessing appropriate experience or qualifications to perform the required determinations.
- Records must be kept of all monitoring of particulate matter (dust) deposition rates and monitoring of the 24-hour concentration average of particulate matter with an aerodynamic diameter less than 10 micrometer (μm) (PM10) suspended in the atmosphere.
- Other potential air emissions (such as CO, SO and Ethanol) are also to be subject to a monitoring program should the need arise.

Performance Criteria / Indicators

- Refer to the aforementioned activities for performance criteria and indicators.

Reporting / Responsibilities

- The Principal must notify the administering authority in writing of any monitoring result that indicates an exceedance of, or non-compliance with, any EMP limit within 28 days of completion of analysis. The written notification is required to detail:
 - i. The full analysis results;
 - ii. Details of investigation or corrective actions taken; and
 - iii. Any subsequent analysis.
- Where requested, the Project Manager is to prepare an environmental compliance monthly monitoring report for submission to administering authority (in hard copy and digital form). Report must detail:
 - i. Table of monitoring results (in Excel);
 - ii. Individual charts of results
 - iii. Brief discussion with recommendations- highlighting any non-standard results;
 - iv. Incidents;
 - v. Corrective actions; and

Procedure – Monitoring, Recording and Notification

- vi. Any EMP revisions.
- The Principal (or delegated authority) is to prepare annual audit reports for submission to council. Report is to document water quality test results, staff requirements, plant requirements, minor and special equipment used. This report shall contain an audit of site activities and compliance with this EMP.
- Records of all performed monitoring results are kept in accordance with this environmental authority and other information required to be recorded in conjunction with such monitoring for a period of at least three (3) years. The Project Manager, or delegate, is to keep records of the above.

Corrective Action

- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register.
- The Site manager shall implement the corrective action as required within the agreed timeframe noted on the CAR.
- The Site manager shall advise the Principal after completion of the corrective action.



Report No. 21-1249.R01

**Proposed Research and
Technology Industry Facility
34 Mill Street, Mossman**

Environmental Noise Assessment

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April 2021

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Acoustics RB Pty Ltd
PO Box 150
Wilston Q 4051
Ph: 07 3356 5555

e-mail: russell@acousticsrb.com.au

Report Prepared for

CocoNutZ Australia Pty Ltd
34 Mill Street
Mossman Q 4873

Attention: Mr Lucas van der Walt (CocoNutZ Australia)
Ms Hannah Neville (Canberra Town Planning)

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SUMMARY

CocoNutZ Australia Pty Ltd has made a Material Change of Use application to Douglas Shire Council for approval to develop a new Research and Technology Industry Facility at 34 Mill Street, Mossman.

Acoustics RB Pty Ltd has been engaged by CocoNutZ Australia Pty Ltd to conduct an assessment of the potential impact of noise from the proposed Research and Technology Industry Facility on the nearby residential premises.

This acoustical assessment has been based on limits for acceptable levels of noise emission tailored to the proposed development by reference to specific provisions of (i) *Environmental Protection (Noise) Policy 2019* [EPP-N 2019], (ii) *Ecocess Guideline Noise – Planning for noise control* [Planning for Noise Control Guideline], (iii) the standard noise level limit setting regime commonly adopted by DES for controlling noise emission from industry and (iv) *Environmental Protection (Noise) Policy 2008* [EPP-N 2008].

From the results this assessment, it has been determined that that compliance with the Phase 1 (ie 2021 crush) noise level limits is predicted to be achieved at all nearby residences.

Notwithstanding, for a number of reasons, there remains the possibility that minor and intermittent exceedances of the noise level limits may occur on occasions during Phase 1. In these circumstances, and for the reasons outlined in Section 7.0 of this report, it is recommended that operation of the new facility should be permitted up to the end of the 2021 crush without requiring that any supplementary noise control measures, notably acoustic barriers, be introduced into the current proposal.

Upon commencement of the 2021 crush, but before completion of commissioning of the new facility, monitoring of current ambient and background noise levels in the community should be undertaken to establish with a degree of accuracy the actual background noise levels to be used for setting limits for acceptable levels of noise emission from the facility during the crush. At that time, (i) a determination of the sound power level of the front end loader should be conducted as well and (ii) the requirement for any reasonably-required supplementary noise control treatment of the front end loader evaluated as a consequence.

Thereafter, upon commencement of operation of the new facility, accurate determinations should be made of (i) the source sound power levels of fixed plant, (ii) the internal reverberant noise levels within the processing sheds and (iii) the current level of noise emission to the nearest residential premises.

In the event that these further determinations establish that non-compliance with the relevant noise level limits is occurring, or may occur on occasions, remedial measures should be evaluated so that appropriate noise control measures can be developed and implemented prior to the commencement of the 2022 crush.

Furthermore, noise level limits for commencement of Phase 2 operations, ie the 2022 off-season, should be set by reference to the ambient and background noise levels measured during the 2021 off-season. In addition, appropriate noise control measures should be developed in order that successful operation of the proposed new facility may be conducted during the remainder of the 2022 off-season and thereafter.



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1.0 Introduction

CocoNutZ Australia Pty Ltd has made a Material Change of Use application to Douglas Shire Council for approval to develop a new Research and Technology Industry Facility at 34 Mill Street, Mossman.

Acoustics RB Pty Ltd has been engaged by CocoNutZ Australia Pty Ltd to conduct an assessment of the potential impact of noise from the proposed Research and Technology Industry Facility on the nearby residential premises.

This acoustical assessment has been based on limits for acceptable levels of noise emission tailored to the proposed development by reference to specific provisions of (i) *Environmental Protection (Noise) Policy 2019* [EPP-N 2019], (ii) *Ecocess Guideline Noise – Planning for noise control* [Planning for Noise Control Guideline], (iii) the standard noise level limit setting regime commonly adopted by DES for controlling noise emission from industry and (iv) *Environmental Protection (Noise) Policy 2008* [EPP-N 2008].

2.0 Subject Site and Proposed Development

2.1 Subject Site and Surrounding Uses

The subject site is located at 34 Mill Street, Mossman, approximately 80km north of Cairns.

The location of the subject site within the township of Mossman is shown in Figure 1. The local authority is Douglas Shire Council.

The proposed new facility will be located within the confines of the Mossman Sugar Mill on land owned by Far Northern Milling Pty Ltd, a subsidiary of Daintree Bio-Precinct. Daintree Bio-Precinct is a grower-owned company aiming to develop bio-technology investment in the region. Further details are provided in Section 2.4 following and Figure 2 attached.

The land for the proposed new facility is proposed to be leased from Far Northern Milling Ltd on a five year (plus five year) term.

Currently, the site is occupied by five sheds which will be converted for use as part of the proposed new facility.

2.2 Proposed Development

Application is being made for an environmentally relevant activity (ERA) for the establishment of a kecap manis¹ production plant (ERA 28 Sugar milling and refining). The development as a Research and Technology Industry Facility that, if successful, may lead to full commercial production of kecap manis.

¹ Kecap manis is an Asian condiment traditionally produced using coconut sugar. Gathering this feedstock is a relatively dangerous and difficult occupation usually carried out by small village-based land holders. The coconut tree is climbed to gather syrup from the cut flower before the flower grows into a coconut. Loss of flowers and the subsequent coconut fruit and can have adverse effects on both tree health and propagation of coconut trees.

Increasing demand in western countries driven by consumers seeking Low-GI alternatives to natural sugar has also contributed to premium prices for coconut sugar putting further pressure on the gathering of syrup from cut flowers. Overexploitation can result in environmental degradation as a result of loss of the coconut trees themselves. Increasing demand for traditional products in combination with young, expanding and increasingly for wealthy population of ASEAN countries is placing very significant pressure on this scarce agri-commodity.



2.3 Overview of Proposed Development

Details of the proposed Research and Technology Industry Facility are available in the documentation for the development application prepared by Canberra Town Planning.

In overview, the proposal is to develop a facility to be able to process up to 10,000 tonnes per year of sugar cane per year, expanding to 100,000 tonnes per year should the process be commercially viable.

Because the acoustical environment of the community is influenced significantly by the operation of the mill, it is expected that two sets of noise level limits will apply to the operation of the proposed new facility: one set of limits applying during the cane harvesting and crushing season, ie the “crush”, when the mill is operational and another applying during the off-season when the mill is shut down.

Consequently, the DA seeks approval for operations in two phases as follows:-

1. Phase 1 – Operations up until the end of the 2021 crushing season
2. Phase 2 – Operations beyond the 2021 crushing season

This acoustical assessment addresses the impact of noise during Phase 1, ie the 2021 crush. During this time, which is expected to extend from approximately June to November, the mill will be operating a 24 hours per day. The proposed new facility is proposed to operate 24 hours per day as well.

A site plan showing the layout of the processing buildings and the fixed external plant proposed to be installed is presented in Figure 3.

The walls of all processing sheds will be constructed using Colorbond wall cladding. The roofs will be constructed using metal cladding lined on the underside with Polynum CLP insulation. During the detailed design phase, it may be necessary to incorporate supplementary or modified insulation to the roof/walls to address thermal design requirements and/or further reduce reverberant internal noise levels.

Roller doors will remain closed during processing operations. The details of the ventilation system for each building will be developed during the detailed design phase. At this stage, however, it is proposed to install within each shed a ducted crossflow fan assisted ventilation system comprising a filtered air-intake on the eastern side and floor-mounted fan units (approximately 10kW each) with a discharge to the western side of the shed. Intake and discharge attenuators, if any necessary, will be designed and installed as appropriate to adequately attenuate any fan noise and to preserve the acoustical integrity of the buildings.

During the crush, the sugar cane billets will be delivered from the mill to the cane bunkers by a rear tray-tip multi-lift vehicles. Typically, 25 tonnes of cane billets can be transferred each load. Three multi-lift loads will be required daily. Delivery times are dependent upon cane harvesting schedules, but an overnight storage capacity equating to 12 hours of production is to be installed to obviate the need to deliver cane to the facility during the night time period.

A single front end loader will be used for two prime purposes: (i) to transfer cane billets from the cane bunkers to the cane infeed into Shed-3 and (ii) to transfer mill mud and cane fibre (bagasse) from the mulch bunker to trucks for subsequent delivery to the mill mud pile and the bagasse storage area at the mill.



2.4 Mossman Mill

Mossman Mill is an active cane processing facility. Mossman Mill was built in 1896, with the first sugar being crushed on-site in 1897. Consequently, it has been an integral feature of the township of Mossman for more than 120 years.

Originally, Mossman Mill was a grower-owned cooperative, but was acquired by Mackay Sugar in 2012. In 2019, local cane growers formed a cooperative, Far Northern Milling Pty Ltd, to buy back the mill from Mackay Sugar and, in so doing, becoming the first cooperative to buy back a sugar mill.

The Mossman Mill is characterised by the following:

- Existing rail infrastructure for cane supply
- Road access suitable for heavy vehicles
- Existing storage and processing of mill mud and cane fibre (bagasse)
- Housing provided on-site which is owned by Far Northern Milling Pty Ltd
- Operational 24/7 during the cane processing season (June-November), with only maintenance activities conducted during the off-season.

Mossman Mill currently operates under Environmental Authority EPPR00920713 which authorises the mill to undertake ERA 15 (fuel burning) and ERA 28 (sugar milling or refining). Under this EA, the mill is not obliged to meet any particular noise level limits. Rather, the activities of the mill must be carried out in accordance with a Noise Management Plan “which progressively reduces the total amount of noise generated in carrying out the environmentally relevant activities.” The general intent of the NMP is to progressively reduce the level of noise emission from the activities of the mill over time as opportunities arise.

It is noted that the strategic goal of the cooperative is to transition the mill from an exporter of sugar onto the world market to a bio-precinct to tap into renewable energy opportunities, with by-products being created at processing facilities on adjacent land.

It is also noted that the proposed Research and Technology Industry Facility that is the subject of this acoustical assessment has both ministerial and financial support from the State government.

The importance of the mill to the economy of the township of Mossman and of the development of bio-precinct to the future prosperity of the township and the surrounding area is self-evident.

2.5 Nearby Residences

As is evident in Figure 1, the nearest residences are those located on the mill site. These residences are owned by Far Northern Milling Pty Ltd and occupied by mill employees. Importantly, it is noteworthy that these residences are not separately titled but, rather, are all located on the land on which the mill has been constructed, ie Lot 27 on RP804231. Consequently, at present there is no ability for these residences to be sold to others.

The closest residence off-site is located to the SSW of the site on Lot 10 on RP706271. This residence is situated 130m from the closest building on the subject site, ie Shed-3.

Other nearby residences are also located to the west. The closest of these are situated on Lot 101 on SR221, Lot 102 on SR221, Lot 103 SR221 and Lot 104 SR221. Each of these residences will be located between 195m and 220m from the nearest shed on the subject site.



3.0 Noise Level Limits

Limits for acceptable levels of noise emission from industrial activities (including rural industries) may be drawn from several sources, eg (i) *Environmental Protection (Noise) Policy 2019* [EPP-N 2019], (ii) *Ecoaccess Guideline Noise – Planning for noise control* [Planning for Noise Control Guideline] and (iii) the standard noise level limit setting regime commonly adopted by DES for controlling noise emission from industry.

For this particular development, however, it is contended that *Environmental Protection (Noise) Policy 2008* [EPP-N 2008] will provide the most appropriate and rigorous set of noise level limits for controlling noise emission from proposed Research and Technology Industry Facility, especially during Phase 1. Further discussion regarding this matter is presented below.

EPP-N 2019 and EPP-N 2008

Environmental Protection (Noise) Policy 2019 [EPP-N 2019] is subordinate legislation under *Environmental Protection Act 1994* [EP Act]. It commenced on 1 September 2019.

It is noted that the purpose of EPP-N 2019 is stated at s.5 Purpose as follows:

- “(1) The purpose of this policy is to achieve the object of the Act in relation to the acoustic environment.
- “(2) The purpose is achieved by—
- (a) identifying and declaring the environmental values of the acoustic environment; and
 - (b) stating acoustic quality objectives that are directed at enhancing or protecting the environmental values; and
 - (c) providing a framework for making consistent, equitable and informed decisions that relate to the acoustic environment.”

As noted in EPP-N 2019 at s.6 *Environmental values*, “The environmental values to be enhanced or protected under this policy are -

- “(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and
- “(b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following -
- (i) sleep;
 - (ii) study or learn;
 - (iii) be involved in recreation, including relaxation and conversation; and
- “(c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.”

At s.7 *Acoustic quality objectives for sensitive receptors*, EPP-N 2019 states:-

- “(1) This section and schedule 1 state the acoustic quality objectives to be achieved and maintained under this policy.
- “(2) For a sensitive receptor stated in schedule 1, column 1, the value stated in schedule 1, column 3 is the acoustic quality objective for the time of day mentioned in schedule 1, column 2 for the sensitive receptor.
- “(3) The environmental value to be enhanced or protected by the acoustic quality objective is stated in schedule 1, column 4 for the sensitive receptor.



“(4) An acoustic quality objective stated in schedule 1 is expressed as a measurement of an acoustic descriptor.

“(5) If it is reasonable in the circumstances, an acoustic quality objective may be progressively achieved and maintained as part of achieving the object of this policy over the long term.”

As noted at s.8 *Management hierarchy for noise* of EPP-N 2019:-

“To the extent it is reasonable to do so, noise must be dealt with in the following order of preference—

“(a) firstly—avoid the noise;

Example for paragraph (a)—

locating an industrial activity in an area that is not near a sensitive receptor

“(b) secondly—minimise the noise, in the following order—

(i) firstly—orientate an activity to minimise the noise;

Example for subparagraph (i)—

facing a part of an activity that makes noise away from a sensitive receptor

(ii) secondly—use best available technology to minimise the noise;

“(c) thirdly—manage the noise.

Example for paragraph (c)—

using heavy machinery only during business hours”

Further, at s.9 *Management intent for noise*, it is stated:-

“(1) This section states the management intent for an activity involving noise that affects, or may affect, an environmental value to be enhanced or protected under this policy.

Note—

See Section 35 of the Environmental Protection Regulation 2019.

“(2) To the extent it is reasonable to do so, noise must be dealt with in a way that ensures—

(a) the noise does not have any adverse effect, or potential adverse effect, on an environmental value under this policy; and

(b) background creep in an area or place is prevented or minimised.

“(3) Despite subsection (2)(b), if the acoustic quality objectives for an area or place are not being achieved or maintained, the noise experienced in the area or place must, to the extent it is reasonable to do so, be dealt with in a way that progressively improves the acoustic environment of the area or place.

“(4) In this section—

background creep, for noise in an area or place, means a gradual increase in the total amount of background noise in the area or place as measured under the document called the ‘Noise measurement manual’ published on the department’s website.”



Finally, the acoustic quality objectives for residences are stated at Schedule 1 as detailed in the extract that follows below.

Column 1	Column 2	Column 3			Column 4
Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		L _{Aeq,adj,1hr}	L _{A10,adj,1hr}	L _{A1,adj,1hr}	
residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30	35	40	health and wellbeing, in relation to the ability to sleep

Extract from Schedule1 of EPP-N 2019 – Acoustic Quality Objectives for Residential Premises

Even though background creep is defined at s.9(4) of the current version of EPP-N, ie EPP-N 2019, this version does not provide any guidance with respect to the appropriate method for preventing or minimising background creep, ie controlling background creep, as required at s.9(2).

In these circumstances (that is, in the absence of any guidance whatsoever with respect to this matter), it is now common practice to continue to refer to s.10 of EPP-N 2008 when determining the appropriate method of controlling background creep.

This method is discussed below.

Environmental Protection (Noise) Policy 2008 [EPP-N 2008] commenced on 1 January 2009. It maintained currency until 1 September 2019 when it was replaced by EPP-N 2019.

The stated application of EPP-N 2008 was as follows: “This policy applies to the acoustic environment.” (Ref. s.4) The stated purpose of the policy was as follows: “The purpose of this policy is to achieve the objective of the Act in relation to the acoustic environment.” (Ref. s.5).

EPP-N 2008 introduced the notion of background creep into Queensland legislation – a matter which was first recognised in Australia as an important consideration in environmental noise control in 1972. It is noted that the general concept of “control and prevention of background noise creep” appeared prior to commencement of EPP-N 2008 in *Ecoaccess Guideline Noise – Planning for noise control* [Planning for Noise Control Guideline]², but EPP-N 2008 was the first document of a statutory nature that address the appropriate means of controlling background creep.

² *Ecoaccess Guideline Noise – Planning for Noise Control* [Planning for Noise Control Guideline] was published by Queensland Environmental Protection Agency on 20 July 2004. By reference to the website of Department of Environment and Science, it is stated that “Planning for noise control guideline” is currently under review. It cannot be accessed directly from the website and, hence, is not available for use. Regrettably, there were a large number of failings within this document. Specifically, it was convoluted and very difficult to use. It contained technical inconsistencies. It was open to misinterpretation: either accidentally or deliberately. And more concerning, it led frequently to perverse outcomes, eg situations where, when applied unthinkingly, the guideline resulted in unreasonable and unjustifiably low noise level limits which would have the resultant effect of severely hampering appropriate industrial development within the State. Recognising some of these difficulties, an attempt was made in late 2013 to revise the guideline. Unfortunately, the revised guideline was still troubled by some of the shortcomings of the earlier document, albeit to a lesser degree. Further, it met with little to no support from the acoustical fraternity within the State. It did not progress past draft status. It is no longer available.



As stated in *Explanatory Notes for SL 2008 No. 442 to EPP-N 2008*, “Background creep occurs when noise levels creep higher and higher over time with the establishment of new development in or near an area. To ensure that the level of noise in an area does not continue to increase unreasonably, background creep needs to be controlled.”

At s.10 *Controlling background creep*, it was stated:-

- (1) This section states the management intent for an activity involving noise.

Note—

See section 51 of the Environmental Protection Regulation 2008.

- (2) To the extent that it is reasonable to do so, noise from an activity must not be—
 - (a) for noise that is continuous noise measured by $L_{A90,T}$ – more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or
 - (b) for noise that varies over time measured by $L_{Aeq,adj,T}$ – more than 5dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.

Standard Industrial Noise Level Limit set by DES and Others

In instances where DES has considered that there is a likelihood of a complaint being lodged with the regulator in respect to noise from a specific noise generating activity, it is not unusual for the Environmental Authority to include limits for acceptable levels of noise emission from the specific activity.

Commonly, in such situations, the EA may include the following provision:-

*In the event of a complaint about noise that the administering authority considers is reasonable, the emission of noise from the activity must not result in levels greater than those specified in **Table 1** of the Noise Schedule until circumstances which gave rise to the complaint are resolved.*

Table 1 has usually taken the following general form:

Noise Level at a Noise Sensitive Place, measured as $L_{Aeq,adj,T}$	Period
Background noise level plus 5dBA	7 am - 6 pm
Background noise level plus 5dBA	6 pm - 10 pm
Background noise level plus 3dBA	10 pm - 7 am

Table 1 – Limits Set in Terms of Measured $L_{Aeq,adj,T}$

Adoption of Controlling Background Creep Provisions of EPP-N 2008

Recognising that the proposed new facility will be located within the precincts of an existing industrial premises, ie Mossman Mill, which itself is a generator of not insubstantial noise levels in the community, it is considered reasonable to set the limits for acceptable levels of noise emission during the Phase 1 operations of the proposed new facility at a point which will adequately control background creep. In the absence of both (i) any guidance on this matter in EPP-N 2019 and (ii) a robust Planning for Noise Control Guideline free of technical inconsistencies and aberrant outcomes, the sole recourse for determining the appropriate means of achieving adequate control of background creep for Phase 1 is that prescribed at s.10 of EPP-N 2008.



Furthermore, recognising (i) that under s.10, the assessment metric for “noise that is continuous noise” is the $L_{A90,T}$ noise level parameter and (ii) that for any source of noise, the emitted $L_{Aeq,adj,T}$ value will always be higher than the emitted $L_{A90,T}$ value – even if the difference is in the order of only 1dBA, a more conservative outcome will result if, when assessing the impact of noise that is continuous, the evaluation of the degree of compliance with the noise level limit is carried out using the $L_{Aeq,adj,T}$ noise level parameter rather than the $L_{A90,T}$ metric.

In these circumstances, the resultant noise level limits for the Phase 1 operation of the proposed new Research and Technology Industry Facility will be as noted in Table 2 below.

No	Type of Noise	Noise Level Limit, dBA
1	Continuous noise, ie processing operations of the facility and fixed plant, but without operation of the front end loader, measured as $L_{Aeq,adj,T}$.	Background noise level + 0dBA
2	Time-varying noise, ie processing operations of the facility and fixed plant and with operation of the front end loader measured as $L_{Aeq,adj,T}$.	Background noise level + 5dBA

Table 2 – Limits for Acceptable Levels of Noise Emission from Facility (ref s.10 EPP-N 2008)

The noise level limits set in Table 2 have been adopted for the Phase 1 assessment that follows.

4.0 Background Noise Levels and Derived Noise Level Limits

As noted above in Section 2.3, the DA seeks approval for operations in two phases, ie Phase 1 for operations up to the end of the 2021 crush and Phase 2 for operations beyond the 2021 crush.

As also noted above, because the acoustical environment of the community is influenced significantly by the operation of the mill, it is expected that two sets of noise level limits will apply to the operation of the proposed new facility: one set of limits applying during the “crush” when the mill is operational (Phase 1) and another applying during the off-season when the mill is shut down (commencement of Phase 2).

As is evident in Table 2, the limits for acceptable levels of noise emission from industrial activities are set relative to the background noise level prevailing at the time. During the crush, the mill will be the dominant source of noise within Mossman. The level of noise generated by the mill during the crush will be very substantially greater than the level of noise emitted during the off-season when the noise generating activities will be confined to maintenance of plant, buildings and infrastructure.

Ordinarily in situations where there is no significant seasonal variation to the ambient and background noise levels, or where such seasonal effects such as the influence of insect noise can be readily addressed using appropriate acoustical techniques, there would be no temporal impediments to conducting monitoring of the ambient and background noise levels. That is, determination of the otherwise prevailing background and ambient noise levels could be undertaken at any time.

At the time of undertaking this noise impact assessment however, the commencement of the crush is still at least two months in the future. Consequently, at the current time, there is no scope to be able to measure directly the ambient and background noise levels that will prevail during the crush, ie at the time when the proposed facility will be first operational. Rather, any noise level measurements undertaken now, ie during the off-season, would capture only the noise generated by maintenance activities of the mill together with the noise from normal domestic and commercial activities in Mossman and from transport movements through Mossman during the off-season.



Fortunately, a web search has uncovered very useful material that can be used to develop a well-informed estimate of the expected level of noise emission from the mill during the crush. Specifically, part of the information submitted to Douglas Shire Council in support of the Development Application lodged in November 2013 seeking approval for Reconfiguration of a Lot (1 lot into 33, open space and new roads) over land at Lot 3 on RP720296, Junction Road, Mossman, presents the results of continuous noise level logging conducted during the 2007 crush. DA Report No 70 Q-07-0149-TRP-245437-0 dated 22 August 2007 prepared by Vipac Engineers & Scientists Ltd refers.

The stated purpose of this report was “to provide a noise impact assessment of the of the Mossman Central Mill Water Intake Pump onto Lots 15, 16, 17, 18, 19, 20 and 21 of the proposed residential development”, ie Lot 3 on RP720296. This report presented the results of ambient noise level measurements conducted in late-July 2007 on Lot 3 on RP720296. Refer also Location “M” shown in Figure 1A.

The results of these noise level measurements were presented in the DA report in graphical format as well as in tabular format.

There are three points to make about the results of these noise level measurements.

Firstly, the measurements were conducted in late July during the crush.

Secondly, the reported average background levels ($L_{A90,T}$) measured in the absence of the operation of the water intake pump but while the mill was operating were tabulated to be as follows:-

- Day: 40dBA
- Evening: 42dBA
- Night: 41dBA

That is, there was a variation of only ± 1 dBA in the RBL values measured during the three time periods. This is an extremely small variation. It is one which would be expected to arise only when there is a dominant source of constant noise operating 24 hours per day.

Thirdly, measurements were at conducted 15 minute intervals continuously over each of the day, evening and night time periods. From an inspection of the graph showing the results of the noise logging conducted with the water intake pump shut down, it is evident that there was significant compression between the noise levels measured using the $L_{A90,T}$, $L_{Aeq,T}$ and $L_{A10,T}$ noise level parameters. On the great majority of occasions, the values of these noise level parameters were contained within a band <6dBA wide. This is a very narrow range.

Importantly, during the more critical evening and night time periods, the difference between the recorded average $L_{A90,T}$ level and the recorded average $L_{Aeq,T}$ level was 3dBA for both time periods. This is also very small difference.

This outcome, ie very narrow range of the $L_{A90,T}$, $L_{Aeq,T}$ and $L_{A10,T}$ noise level coupled with the very small difference between the average $L_{A90,T}$ level and the average $L_{Aeq,T}$ level, further supports the contention that, in the absence of the water intake pump, the dominant source of noise emitted to the logging location was the operation of Mossman Mill.

In these circumstances, and given that is not possible to make a direct determination of the ambient and background noise levels during the crush, it has been concluded that a reasonable, ie relatively conservative, first approximation of the background noise level to adopt at the noise monitoring location during the crush – especially during the more critical night time period – would be 40dBA.



This is a valuable benchmark from which the background noise levels throughout the rest of the community can be predicted. The predictions the background noise levels have been carried out using a SoundPLAN³ noise level prediction model developed specifically for the proposed development. The noise levels emitted throughout the community were calculated using the CONCAWE⁴ prediction algorithms as applied by SoundPLAN. The resultant background noise levels are presented in Figure 4.

Important Note:

For the purposes of this modelling exercise, ie the determination of the noise levels throughout the community, it has been assumed that the entire sound power level of the mill has been concentrated at the discharge of the mill boiler stack. Doing so, however, will tend to result in elevated background noise levels at locations well removed from the mill where these locations are well protected by intervening built form, but will have little to no bearing on the accuracy of the predictions at the closest most affected residences.

From the results presented in Figure 4, the noise level limits applying to continuous noise sources, ie the processing operations carried out with the sheds and the operation of the fixed mechanical plant, at Phase 2 can be determined to be as shown in Figure 5.

Note:

Because the noise level limit for continuous noise sources is set at background noise level plus 0dBA, there is no difference between the contours presented in Figure 4 and those shown in Figure 5. Only the contour description has changed.

The noise level limits applying at Phase 1 to time-varying noise sources, ie the operation of all noise sources including the processing operations and external plant as well as operation of the front end loader can also be determined by reference to the noise contours presented in Figure 4. In this case, because the noise level limit is set at a value equal to the background noise level plus 5dBA, the noise level limits applying to noise that varies over time will be 5dBA higher than those applying to continuous noise sources. The resultant noise level limits time-varying noise sources are presented in Figure 6.

From results presented in Figures 5 and 6, it can be seen that at the closest residence off-site, ie Lot 10 on RP706271, the resultant Phase 1 noise level limits will be 51-52dBA (continuous noise) and 56-57dBA (time-varying noise). At the nearby residences to the west, ie the residences Lots 101-104 on SR221, the resultant noise level limits will be 44-45dBA (continuous noise) and 49-50dBA (time-varying noise).

³ SoundPLAN is an integrated software package for noise and air pollution evaluation developed in Germany by Braunstein + Berndt GmbH. It has been configured to predict the extent of (i) industrial noise emission using the CONCAWE algorithms (with appropriate modifications for short-distance noise level predictions) and (ii) road traffic noise intrusion by application of the CRTN '88 algorithms. It is in use in more than 48 countries and has had widespread application throughout Australia. It is endorsed by Department of Environment and Science (DES), most local authorities in Queensland as well as most other State environmental authorities.

⁴ Conservation of Clean Air and Water in Europe. The CONCAWE methods were developed under funding from European and North American groups to quantify noise prediction procedures for emission from large industrial facilities such as oil refineries and petrochemical plants. The methods were first published in 1981 in research paper CONCAWE Report No. 4/81 entitled *The Propagation of Noise from Petroleum and Petrochemical Complexes to Neighbouring Communities*. In contrast to the methods of ISO 9613-2:1996, the CONCAWE algorithms allow prediction of noise emission under calm conditions and specified stability class conditions. The CONCAWE algorithms are endorsed by DES and most State environmental authorities.



5.0 Noise Level Prediction Methodology

5.1 Noise Model

The extent of noise intrusion into the community from the proposed new Research and Technology Industry Facility was calculated using a second SoundPLAN noise model developed specifically for the proposed development.

Again, the noise levels throughout the community surrounding the site were calculated using the CONCAWE prediction algorithms as applied by the SoundPLAN.

The inputs for the noise prediction model comprised:-

1. The layout of the Research and Technology Industry Facility as shown in the design drawings provided by CocoNutZ Australia.
2. The anticipated internal reverberant sound pressure levels within each of the three process buildings, ie Shed-1, Shed-2 and Shed-3, based on an examination of the proposed items of processing equipment and experience gathered elsewhere in similar food processing facilities.
3. The sound transmission loss performance of the envelope of each building having regard to (i) materials of construction, (ii) placement of roller doors (closed) and (iii) appropriate measures to address sound leakage via ventilation parts.
4. The source sound power level⁵ of each of the major items of external plant and equipment – both fixed and mobile – and the boiler stack by reference to in-house sound power data gathered at other comparable sites.
5. 3-D topographical contours for the site and surrounding community derived from LiDAR data topographical contour file obtained from Q Spatial.
6. Source heights set relative to (i) the appropriate height above ground level for the sources at ground, (ii) building and building roof height for elevated and roof-mounted sources, (iii) likely top of boiler stack and (iv) typical engine and exhaust heights for mobile plant.
7. Locations of nearby sensitive residential receptor locations derived from aerial photography.

The sound power levels for the major noise sources and the anticipated internal reverberant sound pressure levels within each of the three process buildings are presented overpage in Table 2.

Note:

As discussed above in Section 4.0, the acoustical environment of the community is influenced significantly by the operation of the mill. To quantify directly the ambient and background noise levels prevailing in the community during the crush, the noise level monitoring will be conducted soon as feasible after commencement of the 2021 crush. Thereafter, the results of the noise monitoring will be used to refine the assumptions adopted above with respect to the applicable noise level limits for operations during the crush. In addition, to ensure that appropriate noise level limits can be set for the commencement of Phase 2, ie the 2022 off-season, noise level monitoring will be conducted during April/May this year, ie during the quiet period of the 2021 off-season. It is anticipated that a determination of the sound power level of the front-end loader will be conducted during this time as well.

⁵ Sound power level is a measure of how powerful the source is acoustically. It is measured in dBA (re 10^{-12} W, ie 1 picowatt). By contrast, the actual sound pressure level that would be measured at any point will depend on the sound power level and the distance between the source and the receiver. The significance of the difference between these two parameters can be illustrated by drawing the analogy to a light bulb (electric lamp). The difference between sound power level and sound pressure level can be compared to the difference between the power of a light bulb (which is fixed and is measured in Watts) and how bright it appears (which depends on its power as well as the distance from the light bulb).



No.	Location	Source	No of Items	Internal Reverberant Sound Pressure Level, dBA	Sound Power Level, dBA re 10 ⁻¹² W
1	Mill	Entire Mill	1		108 ^(a)
2	Shed-1	Shed-1	1	90	
3	Shed-2	Shed 2	1	85	
4	Shed-2	Shed 3	1	85	
5	Rear of Shed-2	Cooling Tower	1		90
6	Rear of Shed-2	Pump	1		83
7	Rear of Shed-2	Vacuum Pump	1		85
8	Rear of Shed-2	Elements of Concentrator	5		85, ea
9	Adjacent Shed-3	Front End Loader Exhaust	1		105
10	Adjacent Shed-3	Front End Loader Engine Casing	1		105
11	Adjacent Shed-2	Tray-Tip Multi-Lift/Truck Exhaust ^(b)	1		98
12	Adjacent Shed-2	Tray-Tip Multi-Lift/Truck Engine ^(b)	1		98
13	Adjacent Shed-1	Conveyors	2		75.0/m

Table 2 – Noise Sources and Corresponding Source Sound Power Levels

Notes: (a) The sound power level of the entire mill was determined by back calculation from the 40dBA background noise level derived from the work by Vipac. The reasonableness of the derived sound power level was checked against results of determinations of the sound power emitted by the openings in the mill building having regard to the results of hearing conservation surveys conducted at five yearly intervals by the mill during the crush. An adequate degree of correlation was determined.

(b) For all practical purposes, the operation of the tray-tip multi-lift/truck and the front end loader can be considered to occur independently of each other. Having regard to the duration of operation of each of these two items of plant as well as the source sound power levels of each, it is evident that the worst-case situation would arise when the front end loader is operating. This is the situation that has been modelled.

Where the particular noise source will be operated intermittently or cyclically, judgement has been exercised to determine the full suite of noise sources and the number of items of each source that reasonably would be expected to be operated simultaneously under expected worst-case circumstances. In each instance, a conservative approach to setting the relevant source sound power levels was adopted.

5.2 Effect of Particular Atmospheric Conditions

It is noted that, in coastal Far North Queensland, the prevailing winds are east to SE with the highest speed winds excluding cyclones (ie the trade winds) usually occurring during the cooler months, ie April and August. During the summer months, north to NE sea breezes dominate in the local area.

Consequently, the changes to atmospheric conditions will tend to affect the level of noise emitted by the mill in the same way as the level of noise emitted by the proposed new development.

Only in instances of NW winds, and only in the case of the residences to the SSW would it be likely that there would be a reduction in the level of noise emission from the mill which would not be accompanied by a similar reduction in noise emission from the proposed new facility. In any event, it can be readily established that at the distances of separation currently contemplated, this effect will be very small. Furthermore, for the critical night time period, ie when calm winds will tend to prevail, the likelihood of adverse weather conditions arising is very low.



6.0 Results

The results of the environmental noise assessment are presented in the series of $L_{Aeq\ adj, T}$ noise contour plots in Figures 7-10 as described below.

- Figure 7: $L_{Aeq\ adj, T}$ noise levels due to processing operations of CocoNutZ Research and Technology Industry Facility and fixed plant, but without operation of front end loader.
- Figure 8: $L_{Aeq\ adj, T}$ noise levels due to processing operations of CocoNutZ Research and Technology Industry Facility and fixed plant with operation of front end loader.
- Figure 9: Degree of exceedance of noise level limits for continuous noise sources due to processing operations of CocoNutZ Research and Technology Industry Facility and fixed plant, but without operation of front end loader.
- Figure 10: Degree of exceedance of noise level limits for time-varying noise sources due to processing operations of CocoNutZ Research and Technology Industry Facility and fixed plant and with operation of front end loader.

7.0 Discussion and Conclusion

From the results presented in Figures 9 and 10, it can be seen that compliance with the Phase 1 noise level limits is predicted to be achieved at all nearby residences, albeit without any margin of safety.

Normally, in such circumstances, there would be no warrant to meet any specific noise control measures to achieve any further reduction in the level of noise emission from the proposed facility. In this instance, however, it is noted that there are two matters which need also to be taken into account. These are discussed below.

Firstly, as noted above in Section 4.0, the timing of the acoustic study outside the crushing season has prevented the collection of acoustic data during the crush, resulting in reliance being placed upon data gathered by others during an earlier crush to establish the community-wide background noise levels.

Secondly, even though compliance with the relevant noise level limits has been demonstrated as being achieved at all nearby residences, this result has been established without any margin of safety attached to the outcome. This outcome also hinges on the accuracy of the assumptions with respect to the source sound power levels and the internal reverberant levels within processing sheds: none of which can be checked with any degree of accuracy at this point of development of the proposal. Consequently, in the event that actual noise limits are lower than those currently established, and/or the source sound power levels and internal reverberant levels are higher than currently assumed, there is a risk that minor non-compliance may arise.

Taking account of the current constraints imposed by the site and the nature of the noise generating activities, it is likely that, should minor exceedance of the noise level limits arise, the most appropriate means of ameliorating the impact is likely to be by, initially, upgrading of the exhaust muffler of the front end loader and, thereafter if necessary, by constructing a barrier along the southern boundary of the area of the lease for the facility with a return of that barrier constructed along part of the western boundary of the lease area.



While construction of an acoustic barrier prior to commencement of operations may be judged as a desirable measure to be incorporated into the current proposal, a more prudent approach – both commercially and operationally – would be to delay the implementation of any specific noise control measures until such time as environmental noise level monitoring can be carried out on-site during the crush.

There are a number of reasons for adopting this approach. These are as follows:

- It would allow for greater confidence to be gained in the accuracy of the acoustic modelling.
- It would ensure that any attenuation measures such as an acoustic barrier are tailored specifically to suit the degree of attenuation required.
- Because the capital required to construct an acoustical barrier will not be available until 2022, it would facilitate commencement of operations in 2021.
- On the basis of the assessment conducted to date, any exceedance of background noise during the 2021 crush is likely to be minor and of short term duration.

Consequently, and as discussed above, two operational phases are proposed in order to manage acoustical impacts:

1. Phase 1 – Operations up until the end of the 2021 crush
2. Phase 2 – Operations beyond the 2021 crush

It is envisaged that minor and intermittent exceedance of the noise level limits could be accommodated during Phase 1 on the basis that this impact would be temporary and would conclude with the 2021 crush, ie December 2021. Thereafter, with the advantage of having gathered both accurate measurements of the ambient and background noise levels during the crush as well as key noise data on the operations of the facility, the environmental noise impact during Phase 2, ie during the 2022 off-season and, subsequently, during the 2022 crush and beyond, would be regulated in compliance with the relevant criteria.

8.0 Recommendation

From the results presented above in Section 6.0 and by reference to the noise level contours shown in Figures 7-10, it can be seen that compliance with the relevant objective criteria is predicted to be achieved throughout the community during Phase 1.

Notwithstanding, as discussed above in Section 7.0, there remains the possibility that minor and intermittent exceedances of the noise level limits may occur on occasions during Phase 1.

In these circumstances, and for the reasons outlined above in Section 7.0, it is recommended that operation of the new facility be permitted up to the end of the 2021 crush without requiring that any supplementary noise control measures be introduced into the current proposal.

Upon commencement of the 2021 crush, but before completion of commissioning of the new facility, monitoring of current ambient and background noise levels in the community should be undertaken to establish with a degree of accuracy the actual background noise levels to be used for setting limits for acceptable levels of noise emission from the facility during the crush. At that time, (i) a determination of the sound power level of the front end loader should be conducted as well and (ii) the requirement for any reasonably-required supplementary noise control treatment of the front end loader evaluated as a consequence.



Thereafter, upon commencement of operation of the new facility, accurate determinations should be made of (i) the source sound power levels of fixed plant, (ii) the internal reverberant noise levels within the processing sheds and (iii) the current level of noise emission to the nearest residential premises.

In the event that these further determinations establish that non-compliance with the relevant noise level limits is occurring, or may occur on occasions, remedial measures should be evaluated so that appropriate noise control measures can be developed and implemented prior to the commencement of the 2022 crush.

Furthermore, noise level limits for commencement of Phase 2 operations, ie the 2022 off-season, should be set by reference to the ambient and background noise levels measured during the 2021 off-season. In addition, appropriate noise control measures should be developed in order that successful operation of the proposed new facility may be conducted during the remainder of the 2022 off-season and thereafter.

Report Prepared by
Acoustics RB Pty Ltd



Russell Brown
BE (mech) hons MIEAust FAAS MSAEA CPeng
NER APEC Engineer Int PE (Aus) RPEQ 2799





Figure 1 – Site Location, Mossman Mill and Nearby Residences in Adjoining Community



Figure 1A – Noise Level Monitoring Location “M” Adopted by Vipac

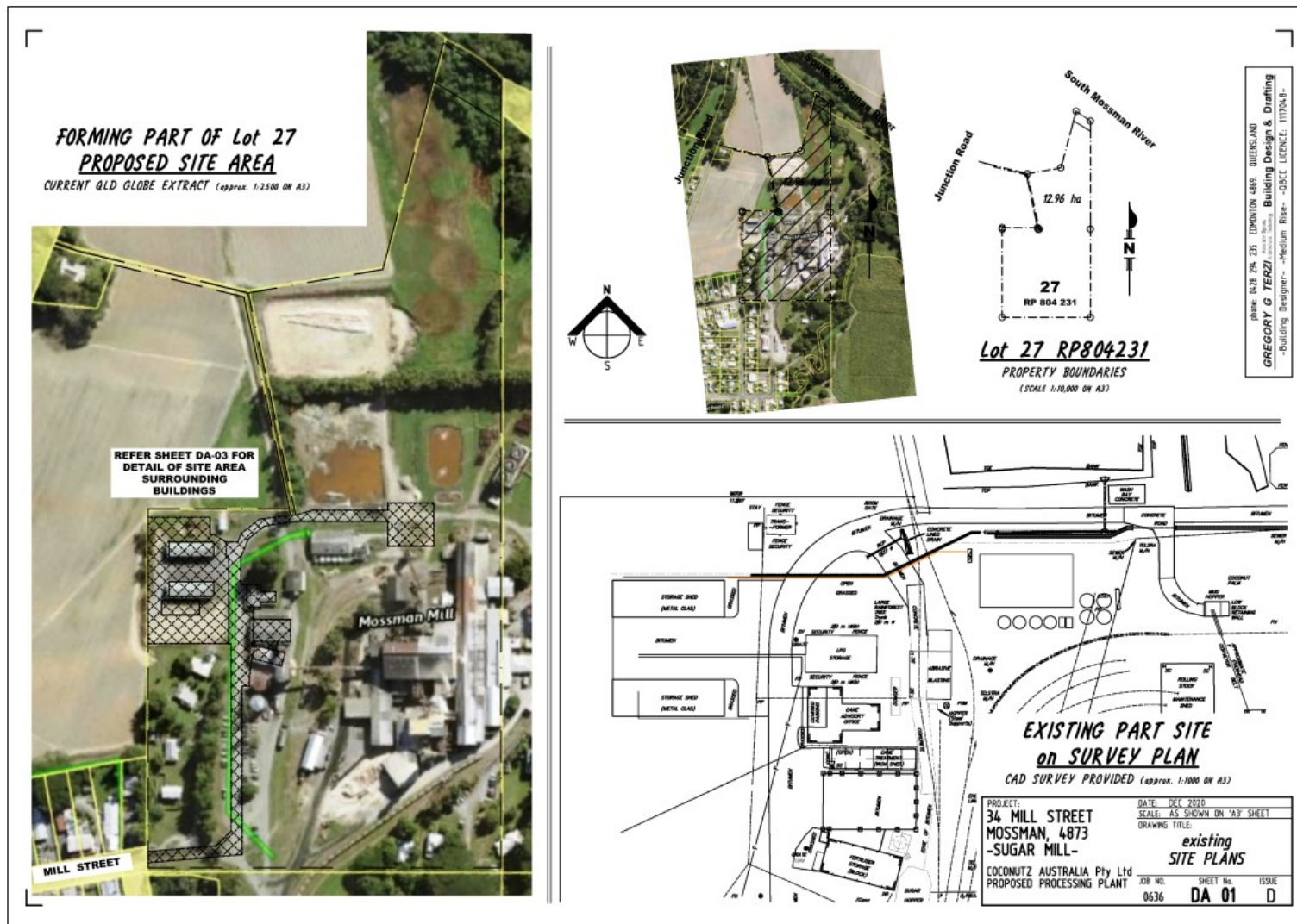


Figure 2 – Location of the Proposed New Facility within Mossman Mill Site

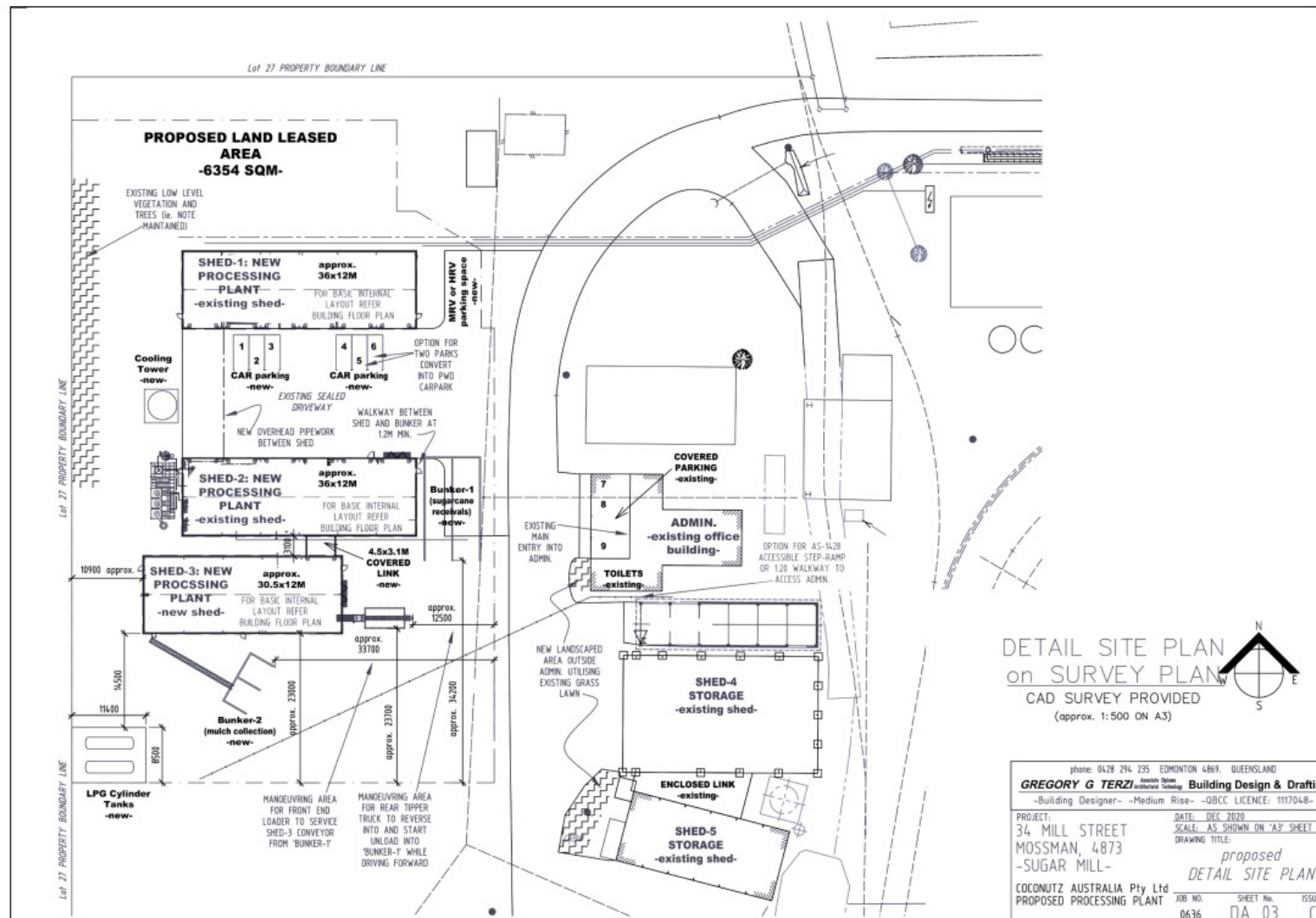


Figure 3 – Layout of Processing Buildings (Shed-1, Shed-2 and Shed-3) and Fixed External Plant

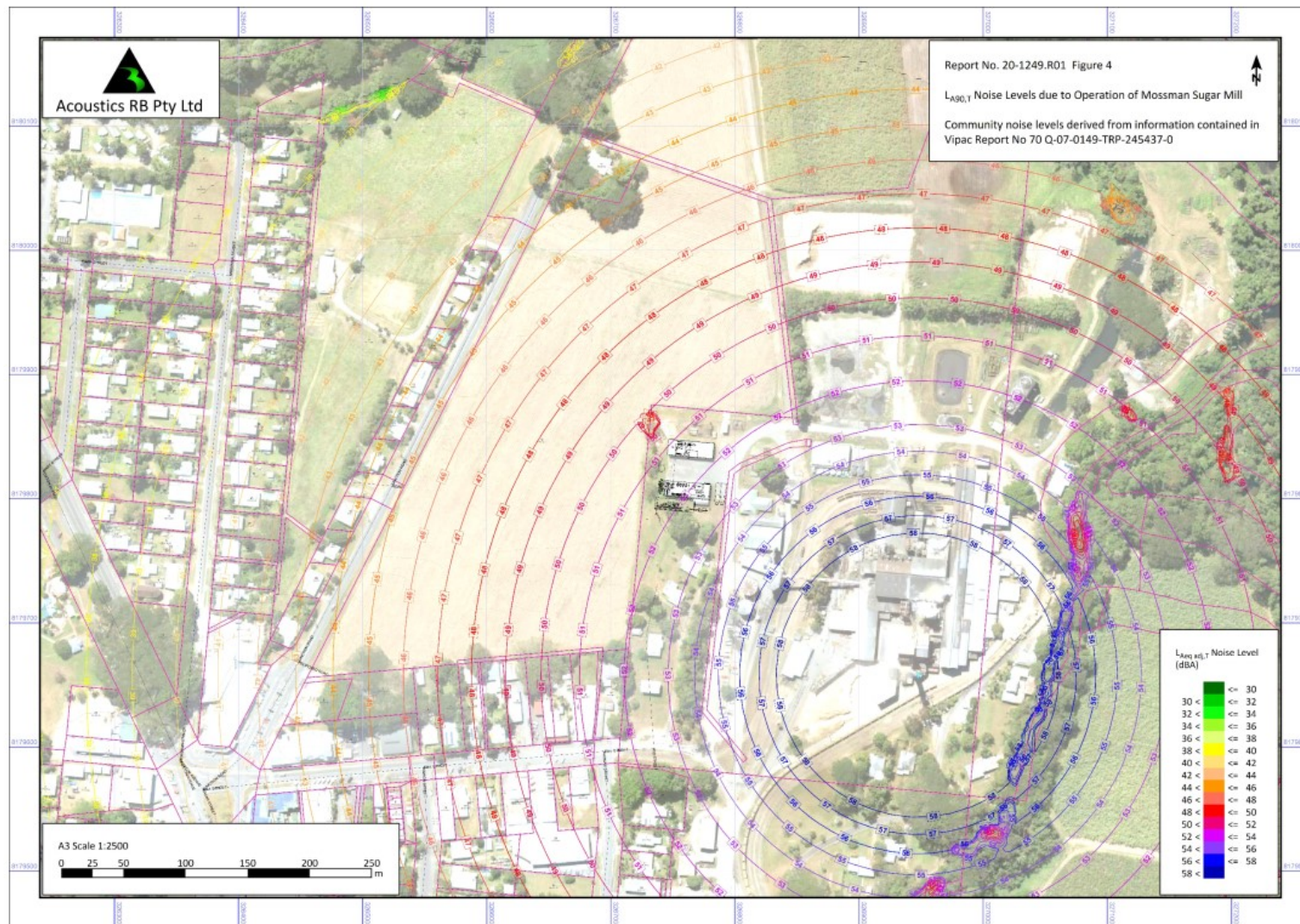


Figure 4 – Resultant Background Noise Levels due to Operation Mill

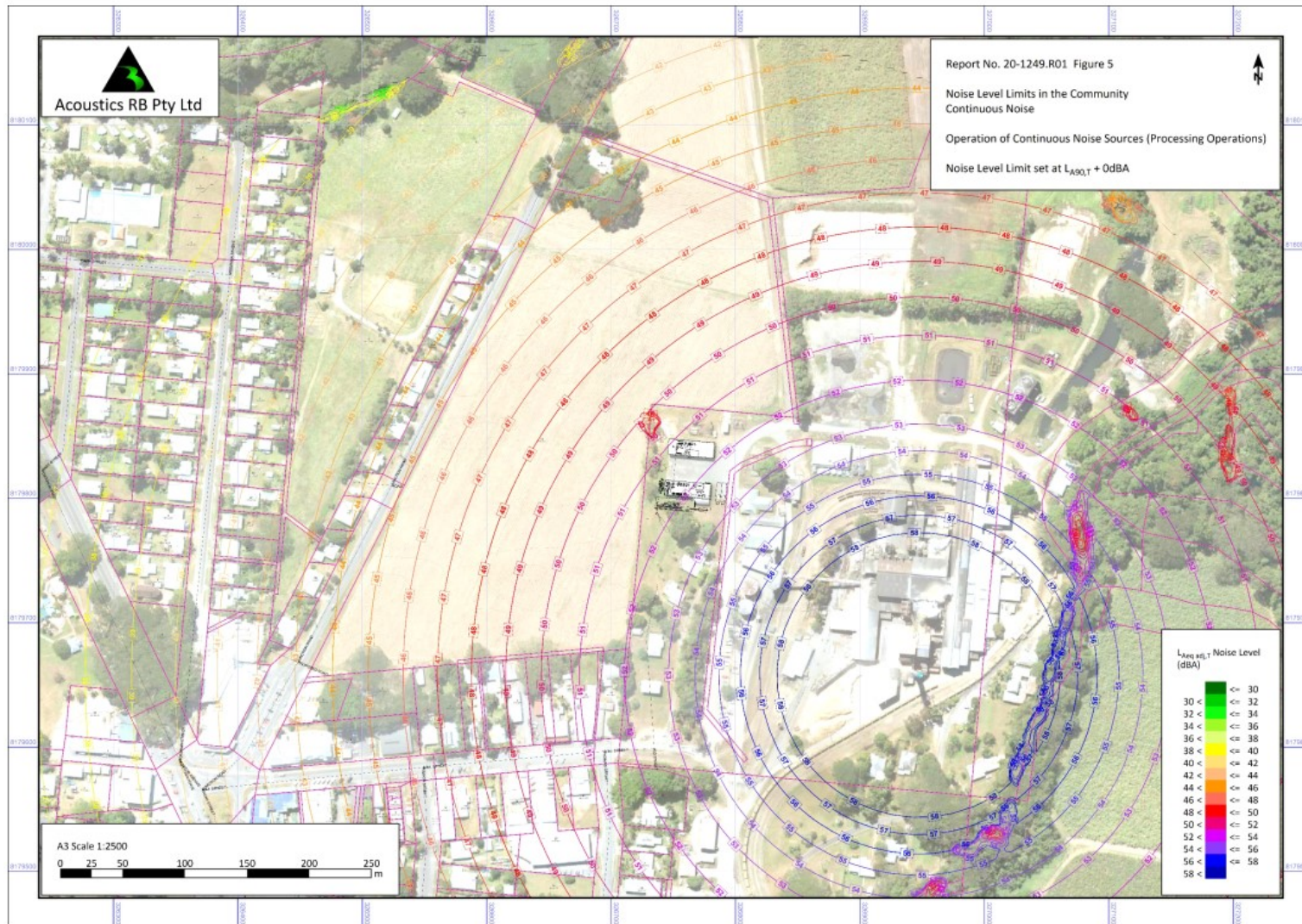


Figure 5 – Noise Level Limits Applying to Continuous Noise Sources

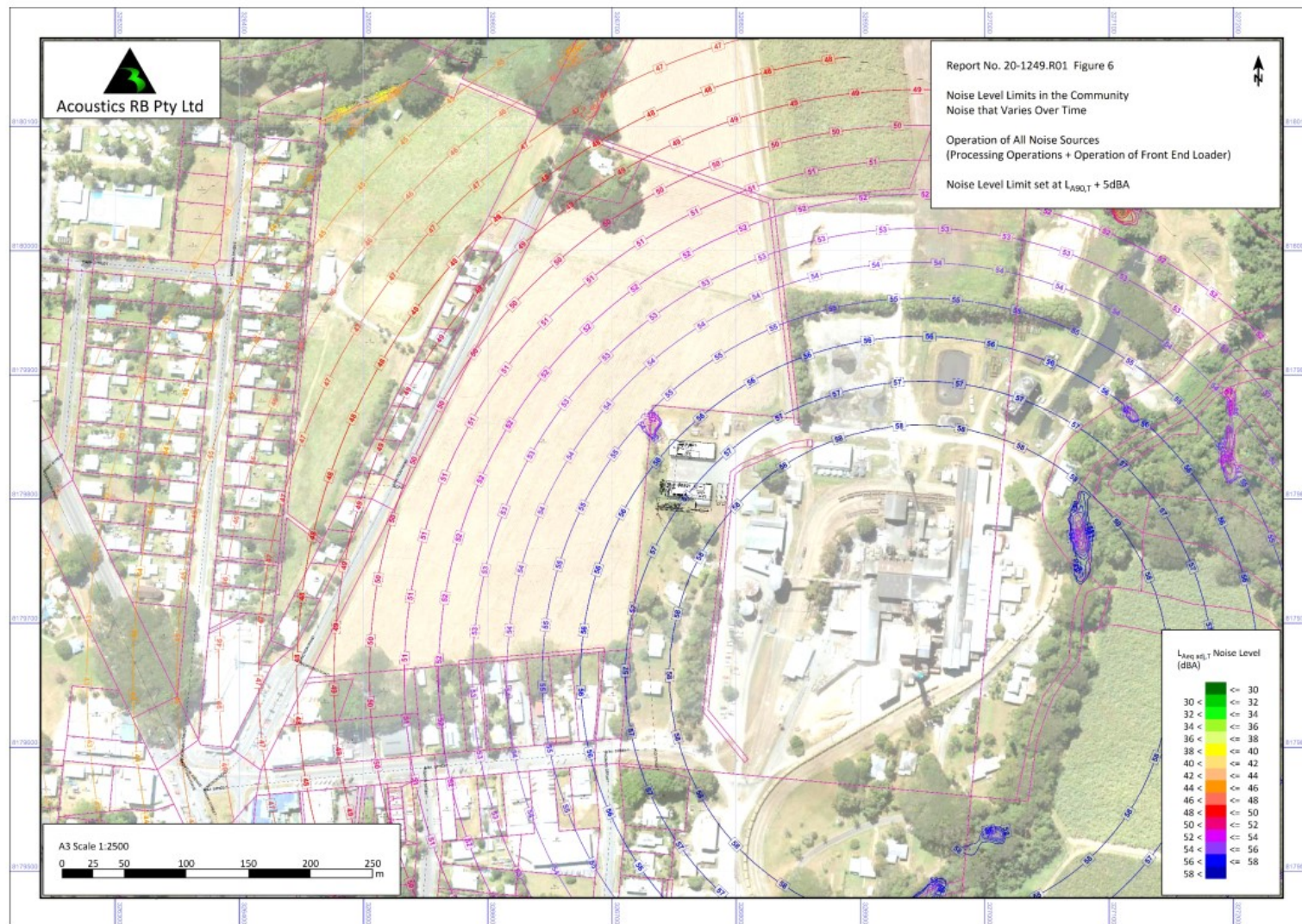


Figure 6 – Noise Level Limits Applying to Time-Varying Noise Sources

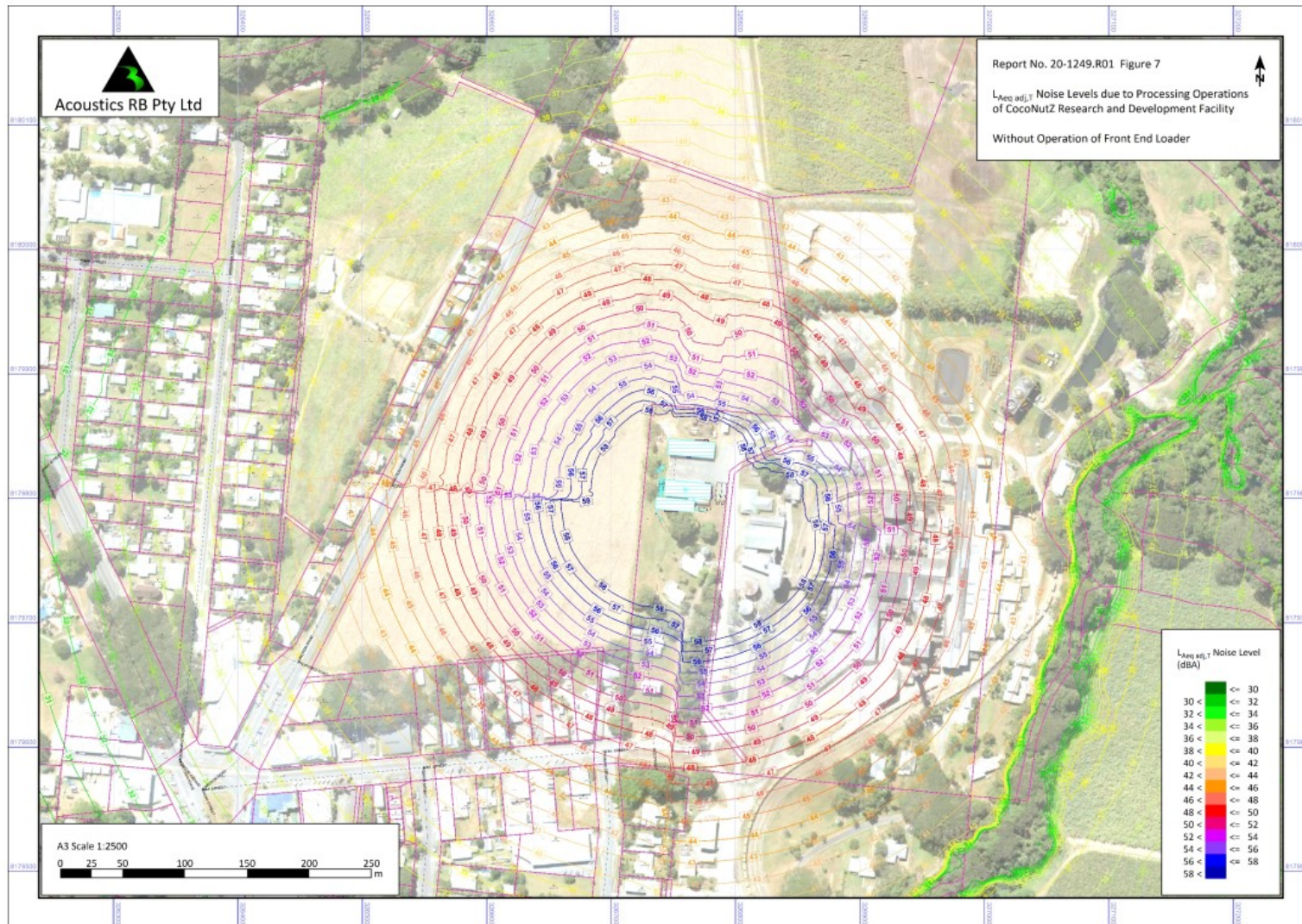


Figure 7 – $L_{Aeq,adj,T}$ Noise Levels Due to Continuous Noise (Processing Operations and Fixed Plant)

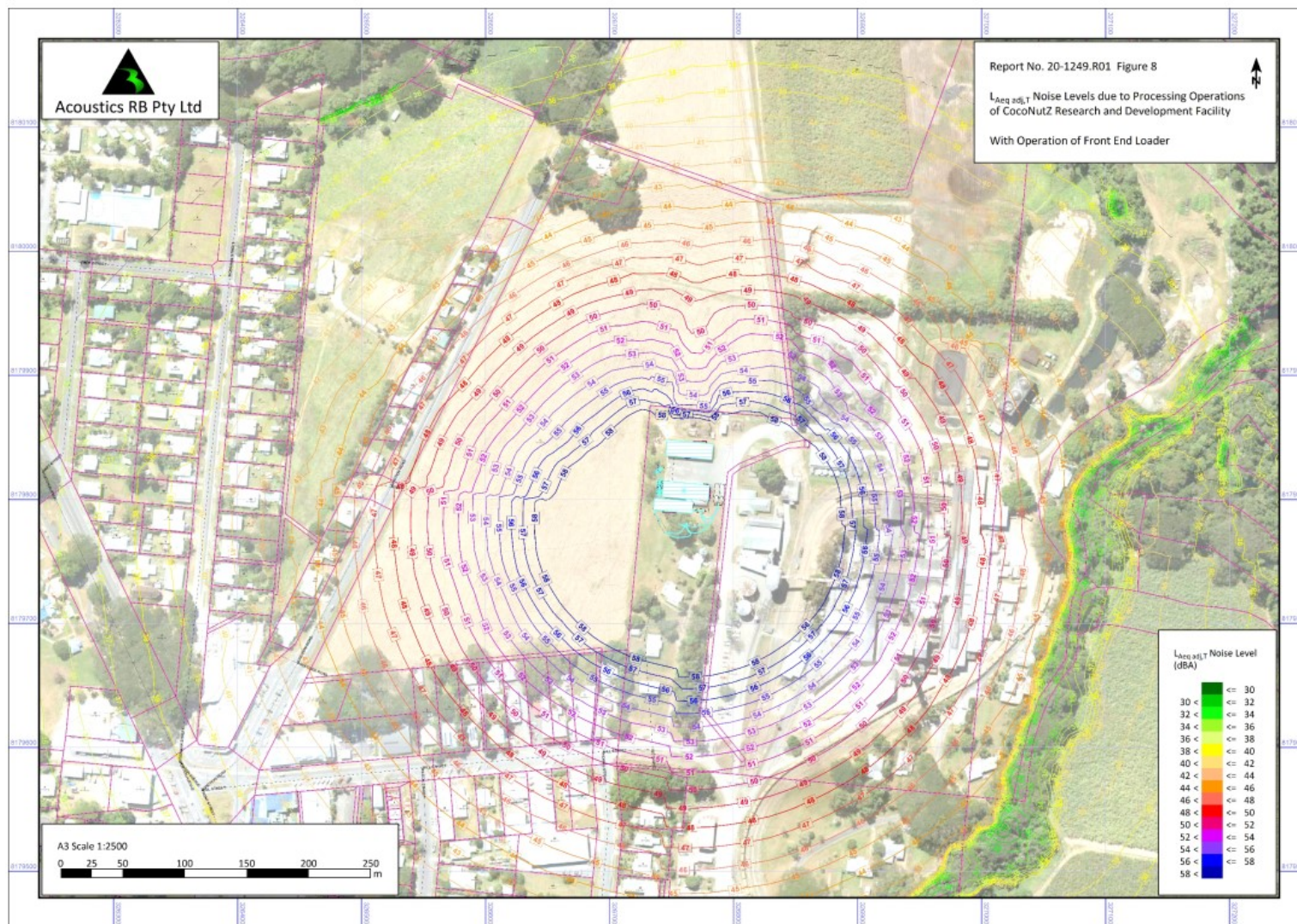


Figure 8 – $L_{Aeq,adj,T}$ Noise Levels Due to Time-Varying Noise (Processing Operations, Fixed Plant and Front End Loader)



Figure 9 – Degree of Compliance with Noise Level Limits for Continuous Noise



Figure 10 – Degree of Compliance with Noise Level Limits for Time-Varying Noise

Attachment 2 - Concurrence Agency Conditions



420 Flinders Street, Townsville QLD 4810
PO Box 1090, Townsville QLD 4810
ergon.com.au

12 April 2021

Douglas Shire Council
Attention: Jenny Elphinstone
Via email: enquiries@douglas.qld.gov.au

cc CocoNutz Australia Pty Ltd
 c/- Canberra Town Planning
 Attention: Hannah Neville
 Via email: hannah@canberratownplanning.com.au

Dear Sir/Madam,

Development Application – Material Change of Use for a Research & Technology Industry (Pilot plant) and the associated Environmental Authority for ERA 28 Sugar milling or refining located at Kidd Street, Mossman, described as Lot 27 on RP804231.
Applicant Ref: MOSSL27RP804231
Council Ref: MCUC 2021_4080/1
Our Ref: HBD 7236741

We refer to the above referenced Development Application which has been referred to Ergon Energy in accordance with the *Planning Act 2016*.

In accordance with Schedule 10, Part 9, Division 2 of the *Planning Regulation 2017*, the application has been assessed against the purposes of the *Electricity Act 1994* and *Electrical Safety Act 2002*. The below response is provided in accordance with section 56(1) of the *Planning Act 2016*.

Should the Assessment Manager decide to approve the proposed Material Change of Use for a Research & Technology Industry (Pilot plant) and the associated Environmental Authority for ERA 28 Sugar milling or refining, as an Advice Agency for the Application, Ergon requires that the assessment manager impose the following conditions:

1. This application is approved in accordance with the below referenced plans. Any alterations to these plans before the development application is decided are to be resubmitted to Ergon for comment:

Have you seen our fact sheets?

See the 'considerations when developing around electricity infrastructure' section of our website
www.ergon.com.au/referralagency

Ergon Energy Corporation Limited ABN 50 087 646 062

Approved Plans				
Title		Plan Number	Issue	Date
Proposed	Detail	DA 03	D	Dec 2020
Site Plan				

2. All easement conditions must be maintained.

All works should be in accordance with Ergon's Standard Guidelines WP1323 for general conditions when considering works either on an easement or in the vicinity of Ergon assets. These are available [online](#) for your reference.

Should you require any further information on the above matter, please contact Angela Cobcroft on 0447 671 554 or email townplanning@ergon.com.au.

Yours faithfully,



Angela Cobcroft
Senior Planner

Have you seen our fact sheets?

See the 'considerations when developing around electricity infrastructure' section of our website www.ergon.com.au/referralagency

Ergon Energy Corporation Limited ABN 50 087 646 062

Page 2



SARA reference: 2104-21984 SRA
 Council reference: MCUC 2021_4080/1
 Applicant reference: MOSSL27RP804231

24 September 2021

Chief Executive Officer
 Douglas Shire Council
 PO Box 723
 Mossman Qld 4873
 enquiries@douglas.qld.gov.au

Attention: Jenny Elphinstone

Dear Sir/Madam

SARA response—Kidd Street, Mossman

(Referral agency response given under section 56 of the *Planning Act 2016*)

The development application described below was confirmed as properly referred by the State Assessment and Referral Agency (SARA) on 13 April 2021.

Response

Outcome:	Referral agency response - No requirements Under section 56(1)(a) of the <i>Planning Act 2016</i> , SARA advises it has no requirements relating to the application.
Date of response:	24 September 2021
Advice:	Advice to the applicant is in Attachment 1 .
Reasons:	The reasons for the referral agency response are in Attachment 2 .

Development details

Description:	Development permit	Material change of use for Research and technology industry (pilot plant)
SARA role:	Referral Agency.	
SARA trigger:	Schedule 10, Part 5, Division 4, Table 2 (Planning Regulation 2017)	
	Development application for a material change of use for an environmentally relevant activity	
SARA reference:	2104-21984 SRA	

Assessment Manager: Douglas Shire Council
 Street address: Kidd Street, Mossman
 Real property description: Lot 27 on RP804231
 Applicant name: CocoNutZ Australia Pty Ltd C/- Canberra Town Planning
 Applicant contact details: 5/32 Lonsdale Street
 Braddon ACT 2612
 mdargusch@wolterconsulting.com.au

Environmental Authority: This referral included an application for an environmental authority under section 115 of the *Environmental Protection Act 1994*. Below are the details of the decision:

- Approved
- Reference: P-EA-100114331
- Effective date: Takes effect on the date the related development approval MCUC 2021_4080/1 takes effect
- Prescribed environmentally relevant activity (ERA): ERA 28 – Sugar milling or refining – Crushing or grinding 200t or more of sugar cane in a year or manufacturing 200t or more of sugar or other sugarcane products in a year

If you are seeking further information on the environmental authority, the Department of Environment and Science's website includes a register. This can be found at: www.des.qld.gov.au

Representations

An applicant may make representations to a concurrence agency, at any time before the application is decided, about changing a matter in the referral agency response (s. 30 Development Assessment Rules)

Copies of the relevant provisions are in **Attachment 3**.

A copy of this response has been sent to the applicant for their information.

For further information please contact Tracey Beath, Senior Planning Officer, on (07) 4924 2917 or via email RockhamptonSARA@dsdilgq.qld.gov.au, who will be pleased to assist.

Yours sincerely



Joanne Manson
 A/Manager (Planning)

cc CocoNutZ Australia Pty Ltd C/- Canberra Town Planning, mdargusch@wolterconsulting.com.au

enc Attachment 1 - Advice to the applicant
 Attachment 2 - Reasons for referral agency response
 Attachment 3 - Representations provisions

Attachment 1—Advice to the applicant

General advice	
----------------	--

- | | |
|----|---|
| 1. | Terms and phrases used in this document are defined in the <i>Planning Act 2016</i> its regulation or the State Development Assessment Provisions (SDAP) v2.6. If a word remains undefined it has its ordinary meaning. |
|----|---|

Attachment 2—Reasons for referral agency response

(Given under section 56(7) of the *Planning Act 2016*)

The reasons for SARA's decision are:

- the proposed development is for a pilot plant for the production of Kecap Manis (an Asian condiment)
- the proposed development is located within the site of the existing Mossman Sugar Mill and will use existing and new buildings
- the proposed development is located and incorporates management measures so that potential impacts on the acoustic environment of nearby sensitive places (residences) will be appropriately managed. The environmental authority issued by the Department of Environment and Science under the *Environmental Protection Act 1994* includes conditions related to management of potential environmental harm to the land, acoustic, air and water environments
- the proposed development does not impact on any areas mapped as Matters of State Environmental Significance, waterways, Category R regulated vegetation or Category C regulated vegetation
- the development complies with relevant provisions of State code 22 of the State Development Assessment Provisions, version 2.6.

Material used in the assessment of the application:

- The development application material and submitted plans
- *Planning Act 2016*
- Planning Regulation 2017
- The *State Development Assessment Provisions* (version 2.6), as published by the Department of State Development, Infrastructure, Local Government and Planning
- The Development Assessment Rules
- SARA DA Mapping system

Notice

Environmental Protection Act 1994

Decision about an application for an environmental authority

This statutory notice is issued by the administering authority pursuant to section 198 of the Environmental Protection Act 1994 to advise you of a decision on your application for an environmental authority.

COCONUTZ AUSTRALIA PTY LTD
34 Mill St
MOSSMAN QLD 4873

Email: mdargusch@wolterconsulting.com.au

ATTN: Michael Dargusch

Your reference: APP0076628

Our reference: C-EA-100114330

Decision about an application for an environmental authority

1 Application details

The application for an environmental authority was received by the administering authority on 14-Apr-2021.

Application reference number: APP0076628

Land description: 27/RP804231

2 Decision

The administering authority has decided to approve the application.

3 Annual fee

The first annual fee is payable within 20 business days of the effective date shown in the attached environmental authority.

The anniversary day of this environmental authority is the same day each year as the effective date.

The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 March.

4 Human rights

A human rights assessment was carried out in relation to this decision/action and it was determined that the decision is compatible with human rights.

Decision about an application for an environmental authority



Signature

Tristan Roberts
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

23 September 2021

Date

Enquiries:

Energy and Extractive Resources
GPO Box 2454, BRISBANE QLD 4001
Phone: (07) 3330 5562
Email: EnergyandExtractive@des.qld.gov.au

Attachments

Environmental authority P-EA-100114331

Permit

Environmental Protection Act 1994

Environmental authority P-EA-100114331

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: P-EA-100114331

Environmental authority takes effect on the date that your related development approval MCUC 2021_4080/1 takes effect. This is the take effect date.

The first annual fee is payable within 20 business days of the take effect date.

Environmental authority holder(s)

Name(s)	Registered address
COCONUTZ AUSTRALIA PTY LTD	34 Mill St MOSSMAN QLD 4873

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
ERA 28 - Sugar milling or refining - Crushing or grinding 200t or more of sugar cane in a year or manufacturing 200t or more of sugar or other sugarcane products in a year	27/RP804231

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority - on the nominated day; or
- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Tristan Roberts

Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

23/09/2021

Enquiries:

Permit and Licence Management
Department of Environment and Science
GPO Box 2454 BRISBANE QLD 4001
Phone: 1300 130 372 (option 4)
Email: palm@des.qld.gov.au

Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

Agency interest: General	
Condition number	Condition
G1	Activities under this environmental authority must be conducted in accordance with the following limitations: 1. The amount of sugar cane milled must not exceed 10,700 tonnes per year.
G2	All reasonable and practicable measures must be taken to prevent or minimise environmental harm caused by the activities.
G3	Any breach of a condition of this environmental authority must be reported to the administering authority as soon as practicable within 24 hours of becoming aware of the breach. Records must be kept including full details of the breach and any subsequent actions taken.
G4	Other than as permitted by this environmental authority, the release of a contaminant into the environment must not occur.
G5	Environmental monitoring results must be kept until surrender of this environmental authority. All other information and records that are required by the conditions of this environmental authority must be kept for a minimum of five (5) years. All information and records required by the conditions of this environmental authority must be provided to the administering authority, or nominated delegate upon request, within the required timeframe and in the specified format.
G6	An appropriately qualified person(s) must monitor, record and interpret all parameters that are required to be monitored by this environmental authority and in the manner specified by this environmental authority.
G7	All analyses required under this environmental authority must be carried out by a laboratory that has National Association of Testing Authorities (NATA) certification, or an equivalent certification, for such analyses.
G8	When required by the administering authority , monitoring must be undertaken in the manner prescribed by the administering authority , to investigate a complaint of environmental nuisance arising from the activity . The monitoring results must be provided within 10 business days to the administering authority upon its request.
G9	The activity must be undertaken in accordance with written procedures that: 1. identify potential risks to the environment from the activity during routine operations, closure and an emergency 2. establish and maintain control measures that minimise the potential for environmental harm 3. ensure plant, equipment and measures are maintained in a proper and effective condition 4. ensure plant, equipment and measures are operated in a proper and effective manner 5. ensure that staff are trained and aware of their obligations under the <i>Environmental</i>

	<i>Protection Act 1994</i> 6. ensure that reviews of environmental performance are undertaken at least annually.																												
G10	Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.																												
Agency interest: Waste																													
Condition number	Condition																												
W1	All waste generated in carrying out the activity must be reused, recycled or removed to a facility that can lawfully accept the waste.																												
Agency interest: Air																													
Condition number	Condition																												
A1	Other than as permitted within this environmental authority, odours or airborne contaminants must not cause environmental nuisance to any sensitive place or commercial place .																												
A2	Contaminants must only be released to air from the point source(s) in accordance with <i>Table 1 – Point source air release limits</i> and the associated requirements. Table 1 – Point source air release limits <table><tr><th>Authorised release point (Latitude, Longitude) GDA2020, Zone 55 Decimal degrees</th><th>Minimum Release height (m)</th><th>Minimum Velocity (m/sec)</th><th>Contaminant</th><th>Maximum Release Limit (unit)</th><th>Minimum Monitoring Frequency</th></tr><tr><td rowspan="3">Boiler 1 (-16.4571, 145.3771) Boiler 2 (-16.4508, 145.3771)</td><td rowspan="3">8</td><td rowspan="3">10</td><td>CO</td><td>-</td><td rowspan="3">Once within three months of commissioning of the plant</td></tr><tr><td>NOx</td><td>350 m (g/Nm³ at 3% O2)</td></tr><tr><td>SO₂</td><td>-</td></tr><tr><td>Vent 1 (-16.4571, 145.3774)</td><td>8</td><td>11.3</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Vent 2 (-16.4568, 145.3775)</td><td>8</td><td>5.7</td><td>-</td><td>-</td><td>-</td></tr></table>	Authorised release point (Latitude, Longitude) GDA2020, Zone 55 Decimal degrees	Minimum Release height (m)	Minimum Velocity (m/sec)	Contaminant	Maximum Release Limit (unit)	Minimum Monitoring Frequency	Boiler 1 (-16.4571, 145.3771) Boiler 2 (-16.4508, 145.3771)	8	10	CO	-	Once within three months of commissioning of the plant	NOx	350 m (g/Nm ³ at 3% O2)	SO ₂	-	Vent 1 (-16.4571, 145.3774)	8	11.3	-	-	-	Vent 2 (-16.4568, 145.3775)	8	5.7	-	-	-
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Vent 1 (-16.4571, 145.3774)	8	11.3	-	-	-																								
Vent 2 (-16.4568, 145.3775)	8	5.7	-	-	-																								

	<p>Associated requirements</p> <ol style="list-style-type: none"> 1. Contaminants released must be directed vertically upwards without any impedance or hindrance. 2. Normal cubic metre (Nm³) means the volume of dry gaseous contaminant which occupies 1 cubic metre at a temperature of zero degrees Celsius and at an absolute pressure of 101.3 kilopascals.
A3	<p>The release of contaminants specified in condition A2 must be monitored in accordance with the following requirements:</p> <ol style="list-style-type: none"> a) Monitoring must be undertaken when emissions are expected to be representative of actual operating conditions for the sample period; b) All monitoring devices must be effectively calibrated and maintained in accordance with the manufacturer's instructions and Australian and international standards; c) Air monitoring must be in accordance with the current edition of the administering authority's 'Air Quality Sampling Manual'. If monitoring requirements are not described in the administering authority's 'Air Quality Sampling Manual', monitoring protocols must be in accordance with a method as approved by approved by New South Wales Environmental Protection Agency, Victorian Environmental Protection Agency or United States of America Environmental Protection Agency; d) The following must be recorded for each sample collected in accordance with <i>Table 1 – Point source air release limits</i>: <ol style="list-style-type: none"> i. stack exit gas velocity and volume flow rate; ii. stack temperature; iii. moisture content (water vapour content); iv. the plant's throughput rate; and v. any factors that may influence air pollutant emissions.
A4	<p>Dust and particulate matter emissions must not exceed the following concentrations at any sensitive place or commercial place:</p> <ol style="list-style-type: none"> a) dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 (or more recent editions), or b) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with Australian Standard AS 3580.9.6 (or more recent editions) or any other method approved by the administering authority.
Agency interest: Land	
Condition number	Condition
L1	Other than as permitted within this environmental authority, contaminants must not be released to land.

Agency interest: Acoustic																																																						
Condition number	Condition																																																					
N1	Other than as permitted within this environmental authority, noise generated by the activity must not cause environmental nuisance to any sensitive place or commercial place.																																																					
N2	<p>Noise from the activity must not exceed the levels identified in <i>Table 2 - Noise limits</i> when measured in accordance with the associated monitoring requirements.</p> <p>Table 2 - Noise limits</p> <table> <tr> <th rowspan="2">Noise measurement</th><th colspan="3">Monday to Sunday – Crushing Season</th><th colspan="3">Monday to Sunday – Non-Crushing Season</th></tr> <tr> <th>7am–6pm</th><th>6pm–10pm</th><th>10pm–7am</th><th>7am–6pm</th><th>6pm–10pm</th><th>10pm–7am</th></tr> <tr> <td></td><td colspan="6">Noise measured at the sensitive place</td></tr> <tr> <td>LAeq, adj, T</td><td>47</td><td>47</td><td>47</td><td>47</td><td>45</td><td>43</td></tr> <tr> <td>Max LpA T</td><td>-</td><td>-</td><td>54</td><td>-</td><td>-</td><td>54</td></tr> <tr> <td></td><td colspan="6">Noise measured at the commercial place</td></tr> <tr> <td>LAeq, adj, T</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td></tr> </table> <p>Associated monitoring requirements</p> <ol style="list-style-type: none"> 1. All monitoring devices must be calibrated and maintained according to the manufacturer's instruction manual. 2. Any monitoring must be in accordance with the most recent version of the administering authority's Noise Measurement Manual. 3. Any monitoring of noise emissions from the activity must be undertaken when the activity is in operation. 						Noise measurement	Monday to Sunday – Crushing Season			Monday to Sunday – Non-Crushing Season			7am–6pm	6pm–10pm	10pm–7am	7am–6pm	6pm–10pm	10pm–7am		Noise measured at the sensitive place						LAeq, adj, T	47	47	47	47	45	43	Max LpA T	-	-	54	-	-	54		Noise measured at the commercial place						LAeq, adj, T	50	50	50	50	50	50
Noise measurement	Monday to Sunday – Crushing Season			Monday to Sunday – Non-Crushing Season																																																		
	7am–6pm	6pm–10pm	10pm–7am	7am–6pm	6pm–10pm	10pm–7am																																																
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LAeq, adj, T	47	47	47	47	45	43																																																
Max LpA T	-	-	54	-	-	54																																																
	Noise measured at the commercial place																																																					
LAeq, adj, T	50	50	50	50	50	50																																																
N3	<p>When required by the administering authority, noise monitoring must be undertaken in accordance with the associated monitoring requirements of <i>Table - Noise Limits</i>, and the results notified within 14 days to the administering authority. Monitoring must include:</p> <ol style="list-style-type: none"> 1. LAeq, adj, T 2. Background noise (Background) as LA 90, adj, T 3. MaxLpA, T 4. the level and frequency of occurrence of any impulsive or tonal noise 5. atmospheric conditions including wind speed and direction 6. effects due to extraneous factors such as traffic noise 7. recording of location, date and time of measurements. 																																																					

N4	The limits in condition N2 do not apply at a sensitive place where an alternative arrangement is in place with the owner and / or occupier of the sensitive place that covers the noise being emitted.
N5	Generation of substantial low frequency noise is not permitted.
Agency interest: Water	
Condition number	Condition
WA1	Other than as permitted within this environmental authority, contaminants must not be released to any waters.
WA2	Stormwater that is not contaminated by the activity must be diverted away from areas where it may become contaminated by the activity. Stormwater that is contaminated by the activity must be directed to a treatment system.

Definitions

Key terms and/or phrases in this environmental authority are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Activity means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.

Administering authority means the Department of Environment and Science or its successor or predecessors.

Alternative arrangement means a written agreement about the way in which a particular environmental nuisance impact will be dealt with at a sensitive place and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.

Appropriately qualified person(s) means a person or persons who has professional qualifications, training, skills or experience relevant to the EA requirement and can give authoritative assessment, advice and analysis in relation to the EA requirements using the relevant protocols, standards, methods or literature.

Background means noise, measured in the absence of the noise under investigation, as $L_{A90,adj,T}$ being the A-weighted sound pressure level exceeded for 90 per cent of the time period of not less than 15 minutes, using Fast response.

Commercial place means a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

Crushing season means the period of time between the 1 June and 25 December.

Disturbed areas include areas:

1. that are susceptible to erosion;
2. that are contaminated by the activity; and/or
3. upon which stockpiles of soil or other materials are located.

Environmental nuisance as defined in Chapter 1 of the *Environmental Protection Act 1994*.

Environmental value –

- a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

Groundwater means water that occurs naturally in, or is introduced artificially into, an aquifer.

Land means any land, whether above or below the ordinary high-water mark at spring tides (i.e. includes **tidal land**).

$L_{Aeq, adj, T}$ means the adjusted A weighted equivalent continuous sound pressure level measured on fast response, adjusted for tonality and impulsiveness, during the time period T, where T is measured for a period no less than 15 minutes when the **activity** is causing a steady state noise, and no shorter than one hour when the approved **activity** is causing an intermittent noise.

$Max_{LpA, T}$ means the maximum A-weighted sound pressure level measured over a time period T of not less than 15 minutes, using Fast response.

Measures has the broadest interpretation and includes:

- Procedural measures such as standard operating procedures for dredging operations, environmental risk assessment, management actions, departmental direction and competency expectations under relevant guidelines
- Physical measures such as plant, equipment, physical objects (such as bunding, containment systems etc.), ecosystem monitoring and bathymetric surveys.

NATA means National Association of Testing Authorities.

Nominated delegate means another government agency that provides services to the **administering authority**.

Non - crushing season means the period of time between the 26 December and 31 May.

Noxious means harmful or injurious to health or physical well-being.

Offensive means causing offence or displeasure; is unreasonably disagreeable to the senses; disgusting, nauseous or repulsive.

Records include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a condition of this authority.

Release of a contaminant into the environment means to:

1. deposit, discharge, emit or disturb the contaminant
2. cause or allow the contaminant to be deposited, discharged, emitted or disturbed
3. fail to prevent the contaminant from being deposited, discharged emitted or disturbed
4. allow the contaminant to escape
5. fail to prevent the contaminant from escaping.

Secondary containment system means a system designed, installed and operated to prevent any release of contaminants from the system, or containers within the system, to land, groundwater, or surface waters.

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

1. a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
2. a motel, hotel or hostel; or
3. a kindergarten, school, university or other educational institution; or
4. a medical centre or hospital; or
5. a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage

Area; or

6. a public park or garden; or
7. for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2019.

Stormwater that is not contaminated by the activity includes stormwater runoff from external or undisturbed catchments.

Substantial low frequency noise means a noise emission that has an unbalanced frequency spectrum shown in a one-third octave band measurement, with a predominant component within the frequency range 10 to 200 Hz. It includes any noise emission likely to cause an overall sound pressure level at a sensitive place exceeding 55 dB(Z).

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

You mean the holder of the environmental authority.

END OF ENVIRONMENTAL AUTHORITY

Adopted Infrastructure Charges



2018 Douglas Shire Planning Scheme version 1.0 Applications

ADOPTED INFRASTRUCTURE CHARGES NOTICE

CocoNutZ Australia Pty Ltd		N/A	0
DEVELOPERS NAME		ESTATE NAME	STAGE
Kidd Street	Mossman	L27 RP804231	4608
STREET No. & NAME	SUBURB	LOT & RP No.s	PARCEL No.
Research and technology industry		MCUI 2020_4080/1	6
DEVELOPMENT TYPE		COUNCIL FILE NO.	VALIDITY PERIOD (year)
1039298	1	Payment before the change occurs	
DSC Reference Doc. No.	VERSION No.		

Infrastructure Charges as resolved by Council at the Ordinary Meeting held on 23 February 2021 (Came into effect on 1 March 2021)

	Charge per Use	rate	Floor area/No.	Amount	Amount Paid	Receipt Code & GL Code
0						
0						
Proposed Demand						
Industry	Research and technology indu	49.24	49.24	366.00	18,021.84	
	Total Demand				18,021.84	
Existing Credit						
	Total Credit	0.00	0	0.00	0.00	Code 895 GL 7470.0135.0825

Required Payment or Credit **TOTAL** **\$18,021.84**

Prepared by	Jenny Elphinstone	29-Sep-21	Amount Paid	
Checked by	Daniel Lamond	29-Sep-21	Date Paid	
Date Payable	MCU - Before the change occurs		Receipt No.	
Amendments		Date	Cashier	

Note:

The Infrastructure Charges in this Notice are payable in accordance with Sections 119 and 120 of the *Planning Act 2016* as from Council's resolution from the Ordinary Meeting held on 23 February 2021.

Charge rates under the Policy are subject to indexing.
Any Infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Charges are payable to: Douglas Shire Council. You can make payment at any of Council's Business Offices or by mail with your cheque or money order to Douglas Shire Council, PO Box 723, Mossman QLD 4873. Cheques must be made payable to Douglas Shire Council and marked 'Not Negotiable.' Acceptance of a cheque is subject to collection of the proceeds. Post dated cheques will not be accepted

Any enquiries regarding Infrastructure Charges can be directed to the Development & Environment, Douglas Shire Council on 07 4099 9444 or by email on enquiries@douglas.qld.gov.au

Reasons for Decision

1. The reasons for this decision are:
 - a. Sections 60, 62 and 63 of the *Planning Act 2016*;
 - b. to ensure the development satisfies the benchmarks of the 2018 Douglas Shire Planning Scheme Version 1.0; and
 - c. to ensure compliance with the *Planning Act 2016*.
2. Findings on material questions of fact:
 - a. the development application was properly lodged to the Douglas Shire Council 8 April 2021 under section 51 of the *Planning Act 2016* and Part 1 of the *Development Assessment Rules*;
 - b. the development application contained information from the applicant which Council reviewed together with Council's own assessment against the 2017 State Planning Policy and the 2018 Douglas Shire Planning Scheme Version 1.0 in making its assessment manager decision.
3. Evidence or other material on which findings were based:
 - a. the development triggered assessable development under the Assessment Table associated with the Industry Zone Code;
 - b. Council undertook an assessment in accordance with the provisions of sections 60, 62 and 63 of the *Planning Act 2016*; and
 - c. the applicant's reasons have been considered and the following findings are made:
 - i. Subject to conditions, the development satisfactorily meets the Planning Scheme benchmarks.

Non-Compliance with Assessment Benchmarks

Development complies with the Planning Scheme and no concerns are raised.

Division 2 Changing development approvals

Subdivision 1 Changes during appeal period

74 What this subdivision is about

- (1) This subdivision is about changing a development approval before the applicant's appeal period for the approval ends.
- (2) This subdivision also applies to an approval of a change application, other than a change application for a minor change to a development approval.
- (3) For subsection (2), sections 75 and 76 apply—
 - (a) as if a reference in section 75 to a development approval were a reference to an approval of a change application; and
 - (b) as if a reference in the sections to the assessment manager were a reference to the responsible entity; and
 - (c) as if a reference in section 76 to a development application were a reference to a change application; and
 - (d) as if the reference in section 76(3)(b) to section 63(2) and (3) were a reference to section 83(4); and
 - (e) with any other necessary changes.

75 Making change representations

- (1) The applicant may make representations (*change representations*) to the assessment manager, during the applicant's appeal period for the development approval, about changing—
 - (a) a matter in the development approval, other than—
 - (i) a matter stated because of a referral agency's response; or

- (ii) a development condition imposed under a direction made by the Minister under chapter 3, part 6, division 2; or
- (b) if the development approval is a deemed approval—the standard conditions taken to be included in the deemed approval under section 64(8)(c).
- (2) If the applicant needs more time to make the change representations, the applicant may, during the applicant's appeal period for the approval, suspend the appeal period by a notice given to the assessment manager.
- (3) Only 1 notice may be given.
- (4) If a notice is given, the appeal period is suspended—
 - (a) if the change representations are not made within a period of 20 business days after the notice is given to the assessment manager—until the end of that period; or
 - (b) if the change representations are made within 20 business days after the notice is given to the assessment manager, until—
 - (i) the applicant withdraws the notice, by giving another notice to the assessment manager; or
 - (ii) the applicant receives notice that the assessment manager does not agree with the change representations; or
 - (iii) the end of 20 business days after the change representations are made, or a longer period agreed in writing between the applicant and the assessment manager.
- (5) However, if the assessment manager gives the applicant a negotiated decision notice, the appeal period starts again on the day after the negotiated decision notice is given.

76 Deciding change representations

- (1) The assessment manager must assess the change representations against and having regard to the matters that

- must be considered when assessing a development application, to the extent those matters are relevant.
- (2) The assessment manager must, within 5 business days after deciding the change representations, give a decision notice to—
- (a) the applicant; and
 - (b) if the assessment manager agrees with any of the change representations—
 - (i) each principal submitter; and
 - (ii) each referral agency; and
 - (iii) if the assessment manager is not a local government and the development is in a local government area—the relevant local government; and
 - (iv) if the assessment manager is a chosen assessment manager—the prescribed assessment manager; and
 - (v) another person prescribed by regulation.
- (3) A decision notice (a ***negotiated decision notice***) that states the assessment manager agrees with a change representation must—
- (a) state the nature of the change agreed to; and
 - (b) comply with section 63(2) and (3).
- (4) A negotiated decision notice replaces the decision notice for the development application.
- (5) Only 1 negotiated decision notice may be given.
- (6) If a negotiated decision notice is given to an applicant, a local government may give a replacement infrastructure charges notice to the applicant.

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

- (1) Schedule 1 states—
 - (a) matters that may be appealed to—
 - (i) either a tribunal or the P&E Court; or
 - (ii) only a tribunal; or
 - (iii) only the P&E Court; and
 - (b) the person—
 - (i) who may appeal a matter (the *appellant*); and
 - (ii) who is a respondent in an appeal of the matter; and
 - (iii) who is a co-respondent in an appeal of the matter; and
 - (iv) who may elect to be a co-respondent in an appeal of the matter.
- (2) An appellant may start an appeal within the appeal period.
- (3) The *appeal period* is—
 - (a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or
 - (b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or
 - (c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

- (d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or
- (e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or
- (f) for an appeal relating to the *Plumbing and Drainage Act 2018*—
 - (i) for an appeal against an enforcement notice given because of a belief mentioned in the *Plumbing and Drainage Act 2018*, section 143(2)(a)(i), (b) or (c)—5 business days after the day the notice is given; or
 - (ii) for an appeal against a decision of a local government or an inspector to give an action notice under the *Plumbing and Drainage Act 2018*—5 business days after the notice is given; or
 - (iii) otherwise—20 business days after the day the notice is given; or
- (g) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

- (4) Each respondent and co-respondent for an appeal may be heard in the appeal.
- (5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.
- (6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—
 - (a) the adopted charge itself; or

- (b) for a decision about an offset or refund—
 - (i) the establishment cost of trunk infrastructure identified in a LGIP; or
 - (ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

- (1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—
 - (a) is in the approved form; and
 - (b) succinctly states the grounds of the appeal.
- (2) The notice of appeal must be accompanied by the required fee.
- (3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—
 - (a) the respondent for the appeal; and
 - (b) each co-respondent for the appeal; and
 - (c) for an appeal about a development application under schedule 1, section 1, table 1, item 1—each principal submitter for the application whose submission has not been withdrawn; and
 - (d) for an appeal about a change application under schedule 1, section 1, table 1, item 2—each principal submitter for the application whose submission has not been withdrawn; and
 - (e) each person who may elect to be a co-respondent for the appeal other than an eligible submitter for a development application or change application the subject of the appeal; and
 - (f) for an appeal to the P&E Court—the chief executive; and

- (g) for an appeal to a tribunal under another Act—any other person who the registrar considers appropriate.
- (4) The *service period* is—
 - (a) if a submitter or advice agency started the appeal in the P&E Court—2 business days after the appeal is started; or
 - (b) otherwise—10 business days after the appeal is started.
- (5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).
- (6) A person elects to be a co-respondent to an appeal by filing a notice of election in the approved form—
 - (a) if a copy of the notice of appeal is given to the person—within 10 business days after the copy is given to the person; or
 - (b) otherwise—within 15 business days after the notice of appeal is lodged with the registrar of the tribunal or the P&E Court.
- (7) Despite any other Act or rules of court to the contrary, a copy of a notice of appeal may be given to the chief executive by emailing the copy to the chief executive at the email address stated on the department's website for this purpose.

231 Non-appealable decisions and matters

- (1) Subject to this chapter, section 316(2), schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.
- (2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.
- (3) A person who, but for subsection (1) could have made an application under the *Judicial Review Act 1991* in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.

(4) In this section—

decision includes—

- (a) conduct engaged in for the purpose of making a decision; and
- (b) other conduct that relates to the making of a decision; and
- (c) the making of a decision or the failure to make a decision; and
- (d) a purported decision; and
- (e) a deemed refusal.

non-appealable, for a decision or matter, means the decision or matter—

- (a) is final and conclusive; and
- (b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the *Judicial Review Act 1991* or otherwise, whether by the Supreme Court, another court, any tribunal or another entity; and
- (c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, any tribunal or another entity on any ground.

232 Rules of the P&E Court

- (1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.
- (2) However, the P&E Court may hear and decide an appeal even if the person has not complied with rules of the P&E Court.

8 October 2021

Enquiries: Jenny Elphinstone
Our Ref: MCUC 2021_4080/1 (Doc ID 1039306)
Your Ref: MOSSL27RP804231

CocoNutz Australia Pty Ltd
(c/o Canberra Town Planning)
C/- Wolter Consulting
Level 2, 1 Breakfast Creek Road
Newstead QLD 4006

Email: mdargusch@wolterconsulting.com.au

Attention Mr Michael Dargusch

Dear Sir

**Adopted Infrastructure Charge Notice
For Development Application for Material Change of Use for a
Research & Technology Industry-(Pilot Plant)
At 1 Kidd Street Mossman
On Land Described as Lot 27 on PTA on RP804231**

Please find attached the Adopted Infrastructure Charges Notice issued in accordance with section 119 of the *Planning Act 2016*.

The amount in the Adopted Infrastructure Charges Notice has been calculated according to Council's Adopted Infrastructure Charges Resolution.

Please also find attached extracts from the Act regarding the following:

- your right to make representations to Council about the Adopted Infrastructure Charges Notice; and
- your Appeal rights with respect to the Adopted Infrastructure Charges Notice.

Please quote Council's application number: MCUC 2021_4080 in all subsequent correspondence relating to this matter.

Should you require any clarification regarding this, please contact Jenny Elphinstone on telephone 07 4099 9444.

Yours faithfully



For
Paul Hoyer
Manager Environment & Planning

encl.

- Adopted Infrastructure Charges Notice
- Rights to Make Representations and Appeals Regarding Infrastructure Charges

Adopted Infrastructure Charges Notice



2018 Douglas Shire Planning Scheme version 1.0 Applications

ADOPTED INFRASTRUCTURE CHARGES NOTICE

CocoNutZ Australia Pty Ltd		N/A	0
DEVELOPERS NAME		ESTATE NAME	STAGE
Kidd Street	Mossman	L27 RP804231	4608
STREET No. & NAME	SUBURB	LOT & RP No.s	PARCEL No.
Research and technology industry		MCUI 2020_4080/1	6
DEVELOPMENT TYPE		COUNCIL FILE NO.	VALIDITY PERIOD (year)
1039298	1	Payment before the change occurs	
DSC Reference Doc. No.	VERSION No.		

Infrastructure Charges as resolved by Council at the Ordinary Meeting held on 23 February 2021 (Came into effect on 1 March 2021)

	Charge per Use	rate	Floor area/No.	Amount	Amount Paid	Receipt Code & GL Code
0						
0						
Proposed Demand						
Industry Research and technology indu	49.24	49.24	366.00	18,021.84		
Total Demand				18,021.84		
Existing Credit						
Total Credit		0.00	0	0.00		
				0.00		Code 895 GL 7470.0135.0825

Required Payment or Credit

TOTAL

\$18,021.84

Prepared by	Jenny Elphinstone	29-Sep-21	Amount Paid	
Checked by	Daniel Lamond	29-Sep-21	Date Paid	
Date Payable	MCU - Before the change occurs		Receipt No.	
Amendments		Date	Cashier	

Note:

The Infrastructure Charges in this Notice are payable in accordance with Sections 119 and 120 of the *Planning Act 2016* as from Council's resolution from the Ordinary Meeting held on 23 February 2021.

Charge rates under the Policy are subject to indexing.

Any Infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Charges are payable to: Douglas Shire Council. You can make payment at any of Council's Business Offices or by mail with your cheque or money order to Douglas Shire Council, PO Box 723, Mossman QLD 4873. Cheques must be made payable to Douglas Shire Council and marked 'Not Negotiable.' Acceptance of a cheque is subject to collection of the proceeds. Post dated cheques will not be accepted

Any enquiries regarding Infrastructure Charges can be directed to the Development & Environment, Douglas Shire Council on 07 4099 9444 or by email on enquiries@douglas.qld.gov.au

Subdivision 5 Changing charges during relevant appeal period

124 Application of this subdivision

This subdivision applies to the recipient of an infrastructure charges notice given by a local government.

125 Representations about infrastructure charges notice

- (1) During the appeal period for the infrastructure charges notice, the recipient may make representations to the local government about the infrastructure charges notice.
- (2) The local government must consider the representations.
- (3) If the local government—
 - (a) agrees with a representation; and
 - (b) decides to change the infrastructure charges notice;the local government must, within 10 business days after making the decision, give a new infrastructure charges notice (a *negotiated notice*) to the recipient.
- (4) The local government may give only 1 negotiated notice.
- (5) A negotiated notice—
 - (a) must be in the same form as the infrastructure charges notice; and
 - (b) must state the nature of the changes; and
 - (c) replaces the infrastructure charges notice.
- (6) If the local government does not agree with any of the representations, the local government must, within 10 business days after making the decision, give a decision notice about the decision to the recipient.
- (7) The appeal period for the infrastructure charges notice starts again when the local government gives the decision notice to the recipient.

126 Suspending relevant appeal period

- (1) If the recipient needs more time to make representations, the recipient may give a notice suspending the relevant appeal period to the local government.
- (2) The recipient may give only 1 notice.
- (3) If the representations are not made within 20 business days after the notice is given, the balance of the relevant appeal period restarts.
- (4) If representations are made within the 20 business days and the recipient gives the local government a notice withdrawing the notice of suspension, the balance of the relevant appeal period restarts the day after the local government receives the notice of withdrawal.

Division 3 Development approval conditions about trunk infrastructure

Subdivision 1 Conditions for necessary trunk infrastructure

127 Application and operation of subdivision

- (1) This subdivision applies if—
 - (a) trunk infrastructure—
 - (i) has not been provided; or
 - (ii) has been provided but is not adequate; and
 - (b) the trunk infrastructure is or will be located on—
 - (i) premises (the *subject premises*) that are the subject of a development application, whether or not the infrastructure is necessary to service the subject premises; or
 - (ii) other premises, but is necessary to service the subject premises.

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

- (1) Schedule 1 states—
 - (a) matters that may be appealed to—
 - (i) either a tribunal or the P&E Court; or
 - (ii) only a tribunal; or
 - (iii) only the P&E Court; and
 - (b) the person—
 - (i) who may appeal a matter (the *appellant*); and
 - (ii) who is a respondent in an appeal of the matter; and
 - (iii) who is a co-respondent in an appeal of the matter; and
 - (iv) who may elect to be a co-respondent in an appeal of the matter.
- (2) An appellant may start an appeal within the appeal period.
- (3) The *appeal period* is—
 - (a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or
 - (b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or
 - (c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

- (d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or
- (e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or
- (f) for an appeal relating to the *Plumbing and Drainage Act 2018*—
 - (i) for an appeal against an enforcement notice given because of a belief mentioned in the *Plumbing and Drainage Act 2018*, section 143(2)(a)(i), (b) or (c)—5 business days after the day the notice is given; or
 - (ii) for an appeal against a decision of a local government or an inspector to give an action notice under the *Plumbing and Drainage Act 2018*—5 business days after the notice is given; or
 - (iii) otherwise—20 business days after the day the notice is given; or
- (g) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

- (4) Each respondent and co-respondent for an appeal may be heard in the appeal.
- (5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.
- (6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—
 - (a) the adopted charge itself; or

- (b) for a decision about an offset or refund—
 - (i) the establishment cost of trunk infrastructure identified in a LGIP; or
 - (ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

- (1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—
 - (a) is in the approved form; and
 - (b) succinctly states the grounds of the appeal.
- (2) The notice of appeal must be accompanied by the required fee.
- (3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—
 - (a) the respondent for the appeal; and
 - (b) each co-respondent for the appeal; and
 - (c) for an appeal about a development application under schedule 1, section 1, table 1, item 1—each principal submitter for the application whose submission has not been withdrawn; and
 - (d) for an appeal about a change application under schedule 1, section 1, table 1, item 2—each principal submitter for the application whose submission has not been withdrawn; and
 - (e) each person who may elect to be a co-respondent for the appeal other than an eligible submitter for a development application or change application the subject of the appeal; and
 - (f) for an appeal to the P&E Court—the chief executive; and

- (g) for an appeal to a tribunal under another Act—any other person who the registrar considers appropriate.
- (4) The *service period* is—
 - (a) if a submitter or advice agency started the appeal in the P&E Court—2 business days after the appeal is started; or
 - (b) otherwise—10 business days after the appeal is started.
- (5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).
- (6) A person elects to be a co-respondent to an appeal by filing a notice of election in the approved form—
 - (a) if a copy of the notice of appeal is given to the person—within 10 business days after the copy is given to the person; or
 - (b) otherwise—within 15 business days after the notice of appeal is lodged with the registrar of the tribunal or the P&E Court.
- (7) Despite any other Act or rules of court to the contrary, a copy of a notice of appeal may be given to the chief executive by emailing the copy to the chief executive at the email address stated on the department's website for this purpose.

231 Non-appealable decisions and matters

- (1) Subject to this chapter, section 316(2), schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.
- (2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.
- (3) A person who, but for subsection (1) could have made an application under the *Judicial Review Act 1991* in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.

(4) In this section—

decision includes—

- (a) conduct engaged in for the purpose of making a decision; and
- (b) other conduct that relates to the making of a decision; and
- (c) the making of a decision or the failure to make a decision; and
- (d) a purported decision; and
- (e) a deemed refusal.

non-appealable, for a decision or matter, means the decision or matter—

- (a) is final and conclusive; and
- (b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the *Judicial Review Act 1991* or otherwise, whether by the Supreme Court, another court, any tribunal or another entity; and
- (c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, any tribunal or another entity on any ground.

232 Rules of the P&E Court

- (1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.
- (2) However, the P&E Court may hear and decide an appeal even if the person has not complied with rules of the P&E Court.