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Preliminary Hazard Analysis

Project Address:	771 Wallamore Road, Wallamore NSW 2340 2340
Prepared for:	Tangaratta Stockfeeds Pty Limited
Report Ref:	380080-TangarattaFeedmill-LotePHA-RevB
Date:	10/05/2024

Commercial in Confidence

Conditions of Use

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A	23/02/2024	Draft for design team review only	Alamgir Hossain	Christopher Koch	Dr S A Magrabi Director – Fire & Risk Engineering BDC No: 0240
B	7/05/2024	Revised upon received of client comments	Alamgir Hossain	Dr S A Magrabi	Dr S A Magrabi Director – Fire & Risk Engineering BDC No: 0240

Report Reading Guide

The scope of this Preliminary Hazard Analysis (PHA) is to assess whether the storage and handling of Dangerous Goods (DGs) at the proposed redevelopment of an existing feedmill, which may result in incidents which have offsite impacts. This PHA is divided into the following sections:

EXECUTIVE SUMMARY

1.0 INTRODUCTION

2.0 METHODOLOGY

3.0 SITE DESCRIPTION

4.0 HAZARD IDENTIFICATION

5.0 CONSEQUENCE ANALYSIS

6.0 FREQUENCY ANALYSIS

7.0 CONCLUSION AND RECOMMENDATIONS

8.0 VALIDITY AND LIMITATIONS

9.0 REFERENCES

The project stakeholders will have varying degrees of involvement in the project risk assessment process with an interest in different sections. It is recommended that each stakeholder read the entire document, paying particularly attention to the sections indicated in Table 0.

Table 0 – Recommended reading guide table for project stakeholders

Stakeholder	Executive Summary	1	2	3	4	5	6	7	8	9	Appendices
Client	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Architect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Certifying Authority	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Services Engineers	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Fire Brigades	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Managing Contractor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Sub-Contractor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Operator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Executive Summary

Tangaratta Stockfeeds Pty Limited, the applicant, is proposing to lodge a State Significant Development (SSD) Application for the construction of a feed mill at 771 Wallamore Road, Wallamore, NSW 2340, which will ultimately replace the existing feed mill on site. The proposed project involves the construction of a new, state of the art, poultry feed mill with the capacity to produce up to 17,500 tonnes of poultry feed per week. The feed mill is to be constructed in two stages with Stage 1 producing up to 12,500 Tonnes per week via the new mill line 1 and the existing mill (daytime production only). Stage 2 will see production increase to 17,500 Tonnes per week utilising the new mill lines 1 and 2. Once both line of the new feed mill is commissioned and operational at full capacity, the existing feed mill will be decommissioned, but retained onsite in a state of readiness as a redundancy in the event of a failure at the new mill.

The facility requires the nominated quantity of hazardous materials/ dangerous goods (DG) at the operation stage. Thus, this Preliminary Hazard Analysis (PHA) is undertaken in accordance with the Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 [1] and No. 6 [2] for submission to the development authority.

Tangaratta Stockfeeds Pty Limited has commissioned Lote Consulting Pty Ltd (Lote) to prepare this PHA, which represents the proposed construction.

Conclusions

This report has reviewed and applied the requirements of the relevant SEPP (Resilience and Hazards) threshold in order to determine whether the policy applies to the Project. The SEPP (Resilience and Hazards) screenings for storage of dangerous goods indicates that none of the hazardous material proposed to be stored onsite would exceed the SEPP (Resilience and Hazards) threshold. Thus, the development should not be classified as a '*Hazardous'* or '*Offensive'* industry.

A qualitative hazard identification was conducted for the facility to identify potential hazards that may be present at the site because of operations or storage of hazardous materials. The (Level 1) qualitative hazard identification determined that there is no offsite impact posed from the proposed site operation because of storage and handling of hazardous materials. The facility is characterised by minor individual packaged inventories of hazardous materials at atmospheric pressure. Any fire incident initiates will be for a short duration and would not pose severe escalation threat and the impact will be contained within the onsite boundary.

However, as per the SEPP (Resilience and Hazards) – other risk factors screening threshold, the proposed development is considered a 'Potentially Hazardous Industry' due to the risk of dust explosion.

A Level 2 risk assessment was conducted for the dust explosion scenario, which concluded that from a land use safety planning perspective, if no action is taken, a potential dust explosion would not have off-site impacts, and no land use or persons outside the site boundary would be affected. The potential dust explosion would occur in a container, e.g., silo, any fragments would be contained within the facility.

The risk reduction measures proposed for mitigation of dust explosion would need to be addressed as part of NSW Work Health and Safety (WHS) Regulations 2017, as they concern worker safety.

The proposed site layout and separation distances between DG storage areas and other building should enable approach of the fire by firefighting personnel. However, if entry into any building is required for firefighting, this will require self-contained breathing apparatus (SCBA) due to the potentially common combustion toxic fumes such as *CO, CO_2 and oxides of nitrogen*.

This study also considered an extended assessment to assess any offsite impacts from a toxic plume of incomplete combustion of stored dangerous goods. *Sal Curb RM E, the largest Class 8 inventory* fire scenario was assessed for incomplete combustion, which concluded that there is no significant offsite

impact (fatality or injury consequences) from toxic product of incomplete combustion, other than generic product of combustion byproduct, e.g., *CO, CO_2 and oxides of nitrogen*.

The facility would also establish best practices in housekeeping and operational procedures. Given this consideration, the proposed development would not introduce any additional risk that may threaten the long-term viability of the development and its effect to the local environment.

The site would be classified as potentially hazardous due to the risk of a dust explosion. However, based on the analysis conducted, it is concluded that the risks from the proposed facility are not considered to exceed the acceptable risk criteria.

Scope of Works Arising

Based on the analysis, the following outcomes arise from the assessment.

a) The Dangerous Goods requirements of the NSW Work Health and Safety Regulation 2017 shall be complied with (i.e., preparation of risk assessments for storage and handling of minor quantities of hazardous materials, etc.)

b) An audit of the dangerous goods storage design to be undertaken for compliance with relevant Codes and Standards, prior to construction of the DG storage area, e.g., Separation distance between Class 3 and 8.

c) Confirm that the distance between the proposed transformer location and any building/ structure comply with the requirements of Table 6.1 of AS 2067:2016. An extract of this is provided in Table 4-2.

d) The transformer should be in a bunded area to contain a potential pool fire due to loss of containment of transformer insulating liquid (C2). This will also mitigate environment contamination as well as offsite impact.

e) Maintain adequate separation distance, minimum 1 metre or a vapour barrier, between the Workshop and Warehouse Office common wall. This will prevent escalation of a fire event initiated from the Workshop and vice versa.

f) The safeguards outlined in Table of *Appendix A – Hazard Identification* shall be implemented including but not limited to:

    i. Provision of adequate personal protective equipment (PPE) for the handling of DG, e.g., chemical gloves, eye protection.

    ii. Provide adequate First Aid Kit.

    iii. Provide adequate fire protection system as per the requirement of relevant Australian Standards and the Building Code of Australia (BCA), etc.

    iv. Provide designated smoking area.

    v. Operator should be trained and competent.

g) Fire protection system and essential safety measures (ESM) shall be routinely tested as per the relevant Australian Standard. e.g., AS 1851:2012.

h) An Emergency Response Plan (ERP) and Emergency Services Information Package (ESIP) shall be prepared in accordance with HIPAP No. 1.

i) To mitigate the potential for dust accumulation, all dust generating areas shall undergo regular housekeeping practices as per the Dust Explosion Study [3].

j) Implement regular housekeeping practices for prevention of build-up of dust.

k) Establish and maintain hazardous area classification (dust) as per the reference [3].

l) Equip facility with dust-sealed machinery to contain hazardous dust clouds.

m) Install suitable dust extraction system at the identified dust release points.

1.0 Introduction

1.1 Background

Tangaratta Stockfeeds Pty Limited, the applicant, is proposing to lodge a State Significant Development Application for the construction of a feed mill at 771 Wallamore Road, Wallamore, NSW 2340, which will ultimately replace the existing feed mill on site. The proposed project involves the construction of a new, state of the art, poultry feed mill with the capacity to produce up to 17,500 tonnes of poultry feed per week. The feed mill is to be constructed in two stages with Stage 1 producing up to 12,500 Tonnes per week via the new mill line 1 and 2. Stage 2 will see production increase to 17,500 Tonnes per week utilising the new mill lines 3 and 4. Once all lines of the new feed mill is commissioned and operational at full capacity, the existing feed mill will be decommissioned, but retained onsite in a state of readiness as a redundancy in the event of a failure at the new mill.

The facility requires the use of a large quantity of hazardous materials/ dangerous goods (DG) at the operation stage. Thus, this Preliminary Hazard Analysis (PHA) is undertaken in accordance with the Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 [1] and No. 6 [2] for submission to the development authority.

Tangaratta Stockfeeds Pty Limited has commissioned Lote Consulting Pty Ltd (Lote) to prepare this PHA, which represents the proposed construction.

1.2 Objectives

It is a requirement for the NSW DPIE to conduct a PHA in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' (HIPAP 6) [2] and Multi-Level Risk Assessment (MLRA) [4].

The objectives of the PHA includes:

a) Assessment of the proposed development with consideration to the provisions of SEPP 33 and compliance with SafeWork NSW requirements.

b) Completion of the PHA according to the *Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 – Hazard Analysis* [2];

c) Assessment of the PHA results using the criteria in *HIPAP No. 4 – Risk Criteria for Land Use Planning* [1]; and

d) Evaluation of any potential hazards imposed by the proposed site operations on the surrounding environment and communities.

e) Making recommendations on the relevant prevention/protection strategies necessary to minimise the impact and risk of human fatalities, property damage and environmental pollution.

1.3 Scope of Services

The scope of work is to complete a PHA study for the proposed development of Tangaratta Stockfeeds mill located at 771 Wallamore Road, Wallamore, NSW 2340 as required by the Planning Regulations.

This PHA specifically addresses hazard analysis associated with the 'potentially hazardous industry' or 'potentially offensive industry' as defined in the Applying SEPP (RESILIENCE AND HAZARDS) guidelines [5] This includes the storage and handling of hazardous materials/Dangerous Goods (DG). The scope of this assessment does not extend to other assessments at the site.

This assessment only considers hazardous materials/DG that have been disclosed to the author, and is limited to the quantities stated in this report. Operational workplace health and safety issues are not within the scope of this assessment. Any deviations in DG type and quantity stated in Section 4.5 should prompt a revision of this report.

It is recommended to read this report in conjunction with the Hazardous Area Classification (Dust) Report by EDC Electrical Design and Construction [3] attached in Appendix C.

1.4 Abbreviations

Abbreviation	Description
ADGC	Australian Dangerous Goods Code
AS	Australian Standard
AQR	Aggregate Quality Ratio
BCA	Building Code of Australia
CBD	Central Business District
CCPS	Center for Chemical Process Safety, USA
DA	Development Application
DG	Dangerous Goods
DPIE	Department of Planning, Industry and Environment
ERP	Emergency Response Plan
ESM	Essential Safety Measures
ESIP	Emergency Services Information Package
FIP	Fire Indicating Panel
FTE	Full Time Equivalent
GFA	Gross Floor Area
HAC	Hazardous Area Classification
HIPAP	Hazardous Industry Planning Advisory Paper
LEL	Lower Explosive Limit
LPG	Liquefied Petroleum Gas
MHF	Major Hazard Facility
MLRA	Multi-Level Risk Assessment
PFD	Process Flow Diagram
PG	Packing Group
PHA	Preliminary Hazard Analysis
SCBA	Self-Contained Breathing Apparatus

Abbreviation	Description
SEPP	State Environmental Planning Policy
SG	Specific Gravity
TARP	Triggered Action Response Plan
WHS	Workplace Health and Safety

1.5 Relevant Project Stakeholders

The relevant project stakeholders that have been nominated by the Client for purposes of participating in the PHA process are outlined in Table 1-1.

Table 1-1 - Project Stakeholders

Name	Company	Role
TBA	Tangaratta Stockfeeds Pty Limited	Client / Owner's Representative
TBA	Department of Planning, Industry and Environment	Regulatory Authority
Rebecca Lees	PSA Consulting	Planner
Erika Dawson	Integrated Consulting	Bushfire Consultant
Lachlan Stephenson Deanne Hansen	MPN	Stormwater Management
Alam Hossain	Lote Consulting	Senior Risk Engineer
Dr Amer Magrabi (BDC No: 0240) Christopher Koch	Lote Consulting	Fire & Risk Engineers

2.0 Screening for SEPP Applicability

Hazardous Materials/Dangerous Goods to be stored onsite have been assessed against the screening threshold limits outlined in "*Applying SEPP 33*" [5], a guideline published by the Department of Planning NSW. This initial screening process determines whether the proposal is potentially hazardous and provides guidance on the level of analysis that is required.

2.1 Potentially Hazardous Industry Assessment

2.1.1 Storage Quantities Screening Against Sepp 33 Threshold

The aggregate storage quantities of the proposed facility are listed individually in Table 2-1. The storage quantities on site are the sum of all premises. If the storage quantity in the proposed facility elevates the total storage quantity above the threshold, then a 'Yes' is given in the last column of the table.

A summary of hazardous materials to be considered for SEPP (Resilience and Hazards) [6] screening using the guideline "*Applying SEPP 33*" [5] is provided in Table 2-1.

It is noted that the primary Class 8 Dangerous Good stored on site is Sal Curb Rm E with a maximum proposed storage of 5,000 L in 5 IBC units. The quantity listed on the manifest is the maximum volume of the storage containers that could fit within the bunded area. The Client has confirmed that only the Sal Curb Rm E is the Class 8 Dangerous Good and that Sal Curb is not proposed to be kept on site at this stage.

Table 2-1 - Chemicals for SEPP (Resilience and Hazards) Screening

DG Class [7]	**Location**	**Screening Threshold (kg)**	**Proposed Storage (kg)****	**Does SEPP (Resilience and Hazards) Apply?**
2.1	Sitewide*	10,000 (16,000 L)	27	No
2.2 (Oxygen)	AREA 1 Warehouse	5,000	80	No
3, PG I	None	2, 000	00	Not applicable
3, PG II & III	Sitewide*	5,000	131	No
8, PG I	None	5,000	00	Not applicable
8, PG II	Chemical shed AREA 2/Amenities	25,000	15 L	No
8, PG IIII	Chemical shed AREA 2/Amenities	50,000	20,000 L or 26,000$^{\Psi}$ kg	No
8, PG IIII	AREA 2/Bunding Area 1	50,000	13,920 L or 18,100 $^{\Psi}$ kg	No
8, PG IIII	AREA 2/Bunding Area 3	50,000	13,920 L or 18,100 $^{\Psi}$ kg	No
9	Sitewide*	Not relevant	40,08,000	Not relevant

DG Class [7]	Location	Screening Threshold (kg)	Proposed Storage (kg)**	Does SEPP (Resilience and Hazards) Apply?
C1 Diesel	AREA 6/ Fire Pump Shed	Not relevant	40 L	Not relevant

*Since individual quantity is minor, aggregated all inventory locations for convenience.

**As per the SEPP 33 application guidelines [5], dangerous goods of a given Class, but varying packing groups are stored in the same general area. Assume the total of that class is present as the most hazardous packing group (for example, if Class 3, PG I and Class 3 PG II are present in the same area, these should be the equivalent of total Class 3, PG I).

Ψ SG of *Sal Curb Rm E* is 1.30 @ 25°C.

Based on the screening in Table 2-1, none of the hazardous material quantity exceeds the SEPP 33 screening threshold. Therefore, it can be assumed that there is unlikely to be a significant off-site risk because of storage and handling of dangerous goods.

2.1.2 Vehicle Movement

As per the SEPP 33 application guidelines, the proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the annual or weekly cumulative vehicle movements shown in Table 2 of SEPP 33.

Table 2-2 - Transportation Screening Thresholds, Ref: Applying SEPP33 Table 2

DG Class	Description	Vehicle Movement		Minimum Quantity per load (Tonne) (see Note 1)		Proposed	Does SEPP 33 Apply
		Cumulative	Peak	Bulk	Package		
2.1	Flammable Gases	>500	>30	2	5	LPG Replenishment Schedule - Once a week	No
2.2	Non-Flammable, nontoxic gases	No limit is set				N/A	No
2.3	Toxic Gases	>100	>6	1	2	N/A	No
3 PG I	Flammable Liquids	>500	>30	1	1	N/A	No
3 PG II		>750	>45	1	10	Total storage 0.131 tonne	No
3 PG III		>1000	>60	10	No limit		No

DG Class	Description	Vehicle Movement		Minimum Quantity per load (Tonne) (see Note 1)		Proposed	Does SEPP 33 Apply
		Cumulative	Peak	Bulk	Package		
4.1	Flammable Solid	>200	>12	1	2	N/A	No
4.2		>100	>3	2	5	N/A	No
4.3		>200	>12	5	10	N/A	No
5	Oxidizing agents	>500	>30	2	5	N/A	No
6.1	Toxic substances	All	All	1	3	N/A	No
6.2	Toxic/ Infectious Substances	See note 2				N/A	No
7	Radioactive material	See note 2				N/A	No
8	Corrosive Substances	>500	>30	2	5	3 to 4 1,000 L IBC delivered monthly (note 3)	No
9	Miscellaneous dangerous substances and articles	>1000	>60	No limit	No limit	N/A	No

Notes:

1. If quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high (Ref: Applying SEPP33 Table 2).

2. Where proposals include materials of Class 1, 6.2 or 7, the Department of Planning should be contacted for advice (Ref: Applying SEPP33 Table 2).

3. The primary Class 8 material delivered to the site is Sal Curb Rm E. This is required for the production of breeder feed, which is planned to be manufactured in the current mill until stage 2 of the development. The Sal Curb Rm E is delivered monthly in 3 to4IBCs (1,000 L capacity) with a maximum of 5 IBCs on site at any one time.

2.2 Potentially Offensive Industry Assessment

The Client has provided the following potential pollution risks based on the various studies undertaken on the land and the process. The below summarises the areas considered, assessments undertaken and conclusions reach by the relevant project stakeholders.

It is noted that the operations will be undertaken in accordance with the State Significant Development Approval, Conditioned Management Plans, and an Environmental Protection License issued under the Protection of Environment Operations Act 1997 as advised by the Planner.

a) **Contamination** - The contamination investigation conducted at the site found no areas or materials of concern. Analytical results for soils and water sampled were below the thresholds for commercial/industrial criteria and water quality guidelines for livestock watering. This meets the standards for the intended development of a feed mill. The site's condition and past/current activities suggest a low potential for significant contamination. Based on the methodology adopted for this investigation, the development site does not contain contaminated land that would impact construction of the new feed mill or pose an unacceptable risk to human health or the surrounding environment.

b) **Stormwater** - Stormwater flows around the feed mill site will be collected and directed through a new internal network of stormwater pits, pipes, and open channels. Runoff from catchments which do not interact with the mill will be channelled through grassed swales around the site, before being released towards the site boundaries via overland flow or towards existing detention basins, while stormwater runoff from the proposed feed mill will be directed to a new detention basin to be constructed on the northern side of the facility. Modelling shows that the proposed system will not create any actionable nuisance for upstream and downstream flows.

   In order to achieve the pollutant load reduction targets for the development, it is proposed to use mechanical and natural treatment methods to treat the runoff prior to discharge from the site. The modelling undertaken shows that the proposed treatment train achieves the required percentage-based load reductions targets and meets the levels required by Tamworth Regional Council and Industry Best Management Practice.

c) **Air Emissions** - Worst-case emissions modelling demonstrates that the predicted concentrations of particulate matter (dust) are increased due to an elevated and unlikely silt content on sealed roads. The maximum predicted 24-hour concentration, when combined with background concentration, exceeds the appliable criteria for both Stage 1 and Stage 2 worst-case scenarios due to the elevated background levels. However, it is noted that this exceedance is driven by an unrealistic maximum background concentration and no additional days above the relevant criteria were predicted as a result of construction or mill operations.

   The milling method proposed is not expected to generate offensive odour. However, odour has been modelled from the mill due to the potential odour emissions associated with drying of the pellets. The modelling shows that odour emissions are will within the adopted criteria at the nearest sensitive receptors.

d) **Noise Emissions** – With respect to site noise, mitigation measures including an acoustic barrier are required to be implemented at the site such that the project complies with the relevant criteria. It is also important to note that the acoustic model assumes that all sources will be operating simultaneously. Therefore, actual received noise levels are expected to be less than the predictions shown in this report, or at worst equal to the predicted noise levels for only part of the time. Predicted noise levels from cars and trucks travelling to and from the site for both Stage 1 and Stage 2 operations, were compliant with the day and night criteria of the Road Noise Policy at surrounding residences.

   Construction noise has the potential to temporary exceed the applicable criteria at the nearest sensitive receptors, particularly the operation of mobile plant and during major concrete pours. Accordingly, a serious of mitigation and management strategies are proposed to minimise emissions during this phase of the project.

2.3 SEPP 33 – Other Risk Factors

Appendix 2 of Applying SEPP 33 outlines other risk factors for consideration to identify hazards outside the scope of the risk screening method. A review of these risk factors was undertaken as shown in Table 2-3.

Two risk factor items were found to trigger a PHA, including the possible existence of dusts within confined areas; and details of known past incidents involving hazardous materials and process in similar industries.

Table 2-3 - SEPP 33 Other Risk Factors

Item No	Risk factor	Comments	PHA Required
1	Any incompatible materials (hazardous and non-hazardous materials)	N/A	No
2	Any wastes that could be hazardous	N/A	No
3	The possible existence of dusts within confined areas	Yes, due to storage and handling of feed mill materials (e.g., grains, flours and ingredients)	Yes
4	Types of activities the dangerous goods and otherwise hazardous materials are associated with (storage, processing, reaction, etc.)	N/A	No
5	Incompatible, reactive or unstable materials and process conditions that could lead to uncontrolled reaction or decomposition	N/A	No
6	Storage or processing operations involving high (or extremely low) temperatures and/or pressures; and	N/A	No
7	Details of known past incidents (and near misses) involving hazardous materials and processes in similar industries.	Yes. Dust explosion incidents are known risk in the industry.	Yes

2.4 Conclusion on the applicability of SEPP 33

The proposed development is considered a '*Potentially Hazardous Industry*' due to the risk of dust explosion.

This report has adopted a conservative approach, opting to conduct a PHA study to assess potential major offsite risks associated with the toxic plume from a DG fire scenario too.

This subsequent section of this report identified PHA associated with dust and toxic plume.

2.5 Dangerous Goods Storage Requirements

The quantity of hazardous materials and dangerous goods proposed to be stored on site are mostly minor quantity. It is an expectation that the facility would be designed to conform to the NSW Work Health and Safety Regulation 2017 [8], and applicable Australian Standards.

All DGs storage and handling practices would comply with (as applicable):

a) NSW Work Health and Safety Act 2011;

b) NSW Work Health and Safety Regulation 2017;

c) AS 1940:2017 – The storage and handling of flammable and combustible liquids;

d) AS/NZS 2833:2007 - The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers;

e) SafeWork Australia – National Standard for the Storage and Handling of Dangerous Goods [NOHSC:1015 (2001)];

f) SafeWork Australia – National Code of Practice for the Storage and Handling of Dangerous Goods [NOHSC:2017 (2001)];

g) How to manage risk of hazardous chemicals (N.S.W. Code of Practice provided as guidance until approved in 2012);

h) Globally Harmonised System of Classification and Labelling of Chemicals 10th Revised Edition (2023) (GHS Rev.10);

i) Guidance on the Classification of Hazardous Chemicals under the WHS Regulations;

j) Safe Work Australia ISBN 978-0-642-78340-0; and

k) Australian Dangerous Goods (ADG) Code v7.8 edition.

3.0 Methodology

3.1 Multi-Level Risk Assessment

The Multi-Level Risk Assessment approach [4] published by the NSW Department of Planning and Environment has been used as the basis for the study to determine the level of risk assessment required. The approach considered the development in context of its location, the quantity and type (i.e., hazardous nature) of the Dangerous Goods stored and used, and the facility's technical and safety management control. The Multi-Level Risk Assessment Guidelines are intended to assist industry, consultants and the consent authorities to carry out and evaluate risk assessments at an appropriate level for the facility being studied.

There are three levels of risk assessment set out in Multi-Level Risk Assessment, which may be appropriate for a PHA, as detailed in Table 3-1.

Table 3-1 - Level of Assessment PHA

Level	Type of Analysis	Appropriate if:
1	Qualitative	No major off-site consequences and societal risk is negligible
2	Partially Quantitative	Off-site consequences but with low frequency of occurrence
3	Quantitative	Where 1 and 2 are exceeded

The Multi-Level Risk Assessment approach is schematically presented in Figure 3-1.

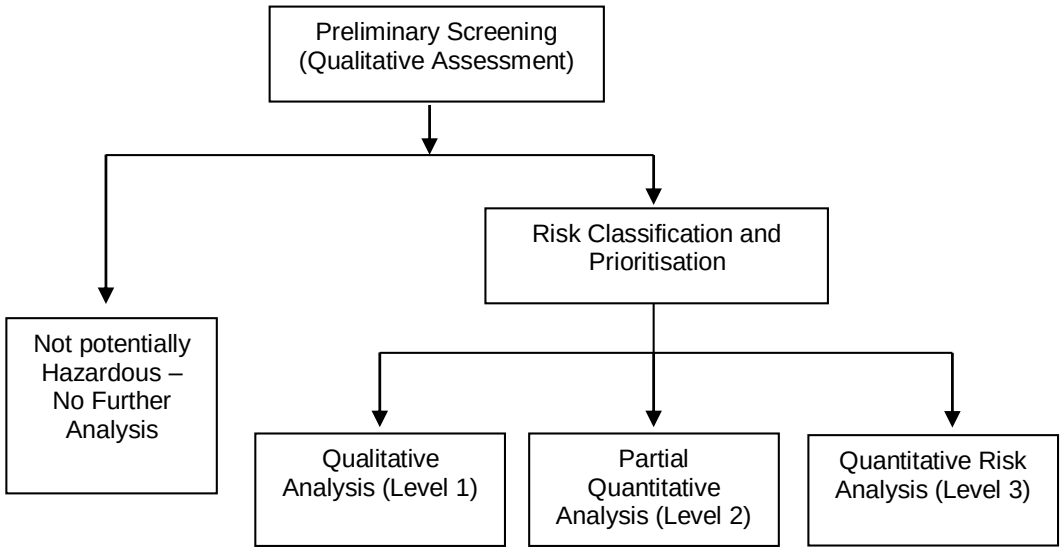


Figure 3-1: The Multi-Level Risk Assessment Approach

Based on the type of DGs to be used and handled at the proposed facility, a Level 1 and Level 2 Assessment was selected for the site. Level 1, (i.e., qualitative risk assessment), was conducted for the determination and screening of off-site consequences but with low frequency of occurrence, and subsequently Level 2, (i.e., semi-quantitative analysis) was conducted. This approach provides a qualitative assessment of those DGs of lesser quantities and hazard, and a quantitative approach for the more hazardous materials to be used on-site. This approach is commensurate with the methodologies recommended in "*Applying SEPP 33's*" Multi Level Risk Assessment approach [4].

3.2 Risk Assessment Study Approach

The methodology used for the PHA is as follows:

Hazard Analysis – A detailed hazard identification was conducted for the site facilities and operations. Where an incident was identified to have a potential off-site impact, it was included in the recorded *Hazard Identification Word Diagram* in Appendix A. The hazard identification word diagram lists incident type, causes, consequences and safeguards. This was performed using the word diagram format recommended in HIPAP No. 6 [2].

Each identified hazardous incident was assessed qualitatively considering proposed safeguards (engineering and administrative controls). Where a potential offsite impact was identified, the incident was carried into the main report for further analysis. Where the qualitative review in the main report determined that the safeguards were adequate to control the hazard, or that the consequence would have no offsite impact, no further analysis was performed. Section 5.1 of this report provides details of criteria used to assist in selecting incidents required to be carried forward for further Level 2 analysis.

Consequence Analysis – For those incidents qualitatively identified in the hazard analysis to have a potential offsite impact, a detailed consequence analysis was conducted. The analysis modelled the various postulated hazardous incidents and determined impact distances from the incident source. The results were compared to the consequence criteria listed in HIPAP No. 4 [1]. The criteria selected for screening incidents is discussed in Section 5.1.

Where an incident was identified to result in an offsite impact, it was carried forward for frequency analysis. Where an incident was identified to not have an offsite impact, and a simple solution was evident (e.g., move the proposed equipment further away from the boundary), the solution was recommended, and no further analysis was performed.

Frequency Analysis – In the event an effective and reasonable control measure could not be found to mitigate consequence impact within tolerable limit, each incident identified to have potential offsite impact was subjected to a frequency analysis. The analysis considered the initiating event and probability of failure of the safeguards (both hardware and software). The results of the frequency analysis were then carried forward to the risk assessment and reduction stage for combination with the consequence analysis results.

Risk Assessment and Reduction – Where incidents were identified to impact offsite and where a consequence and frequency analysis was conducted, the consequence and frequency analysis for each incident were combined to determine the risk and then compared to the risk criteria published in HIPAP No. 4 [1]. Where the criteria were exceeded, a review of the major risk contributors was performed, and the risks reassessed incorporating the recommended risk reduction measures. Recommendations were then made regarding risk reduction measures.

Reporting – on completion of the study, a draft report was developed for review and comment by the design team. A final report was then developed, incorporating the comments received from the design team for submission to the Regulatory Authority.

4.0 Site Description

4.1 Site Location and Surroundings

The proposal development is at 771 Wallamore Road, Wallamore, NSW 2340, which contains the current Tangaratta Stockfeeds mill. The site is formally described as Lot 4 on DP578865 and has an area of 40.62 ha. As shown in Figures 4-1, the site has been historically cleared and used for agricultural purposes while the central portion of the site has been subject to re-vegetation with planted natives undertaken by the Applicant. The application will also include Lot 1 on DP1077646 as the existing access driveway to the site traverses the Main Northern Rail Line Corridor.

There is an unconstructed rail corridor running north / south along Wallamore Road owned by the NSW State Rail Authority and managed by UGL Regional Linx. As shown in Figure 4-2, the site is surrounded by a range of agricultural and rural industrial uses, including cropping, poultry farms, a dairy, rural supply businesses. The nearest residential dwellings are located ~310 m to the North, 530 m to the West, 690 m to the Northeast and 710 m to the East of the proposed feed mill, refer to Figure 4-3.

Figure 4-1 – Tangaratta feedmill – site location (Source Nearmap)

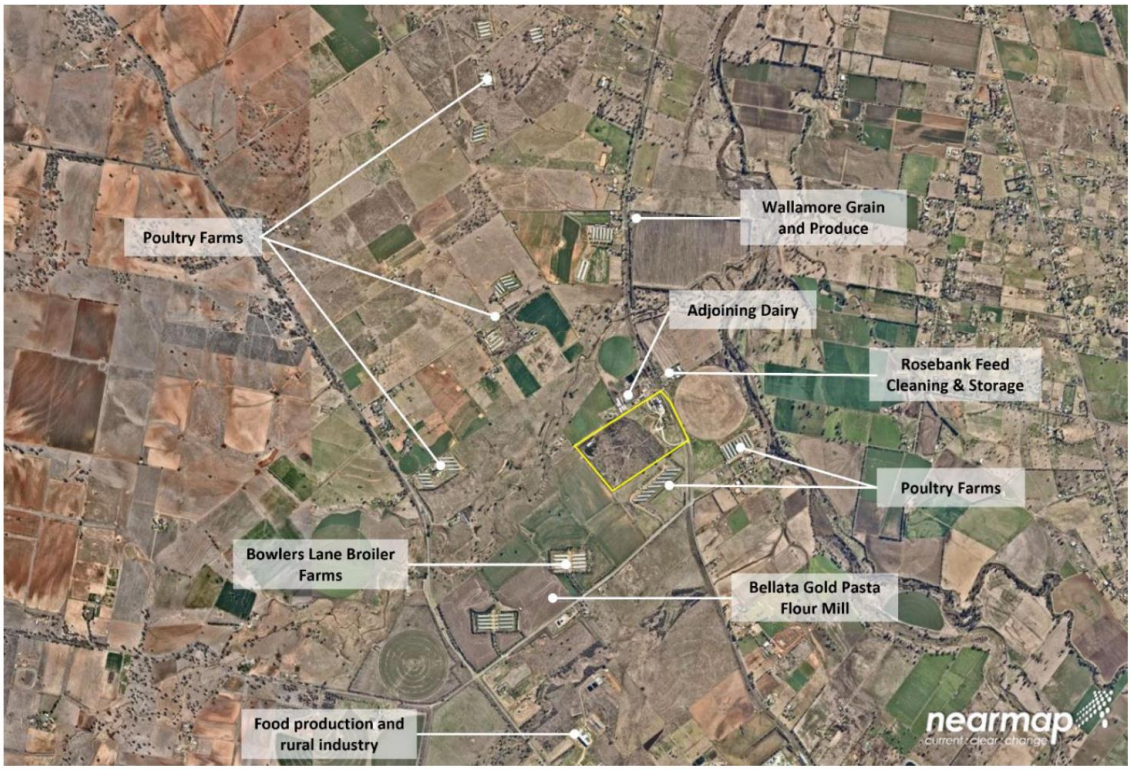


Figure 4-2 – Tangaratta feedmill - site context (Source Nearmap)

Figure 4-3 – Tangaratta feedmill - nearest sensitive receptors (Source Nearmap)

4.2 General Description

The proposed feed mill is intended to produce feed for Baiada's operations in the Tamworth region as well as some third parties. As per the existing mill, the proposed feed mill involves the import of ingredients to the site which are then blended and mixed to create poultry feed products specified by the Baiada company nutritionists. The feed components processed on the site include cereal grains (such as wheat, oats, barley and sorghum); protein meals, (including animal and vegetable meals), together with selected vitamins and minerals. The proposed feed mill will be a modern, best practice and purpose-built poultry feed mill. The mill will have a Gross Floor Area (GFA) of approximately 3,700 m^2 and a maximum height of ~36.5m above ground level.

The raw materials are supplied from company owned and contract suppliers, with approximately, 80% of the products being sourced from the New England region. The feed produced on the site is then used by Baiada Group for poultry farming in the region [9].

Main Areas of Construction:

Specifically, the new poultry feed mill will incorporate the following key constructions:

- Weighbridges for both incoming and outgoing product.
- An intake building for transfer of ingredients from trucks to storage silos.
- Storage silos allowing holding grain and other ingredients prior to processing.
- A mill tower incorporating all processing equipment required to create palletised feed products.
- Out loading bins and buffer storage for holding feed prior and dispatch into trucks.
- Boiler house and maintenance workshop.
- Storage bunkers for bulk storage of grain.
- Administration building and staff amenities.
- Supporting Infrastructure.
- Driveways, parking and maneuvering areas and truck wash.

The site layout plans are shown in Figures 4-4, 4-5, 4-6 and 4-7.

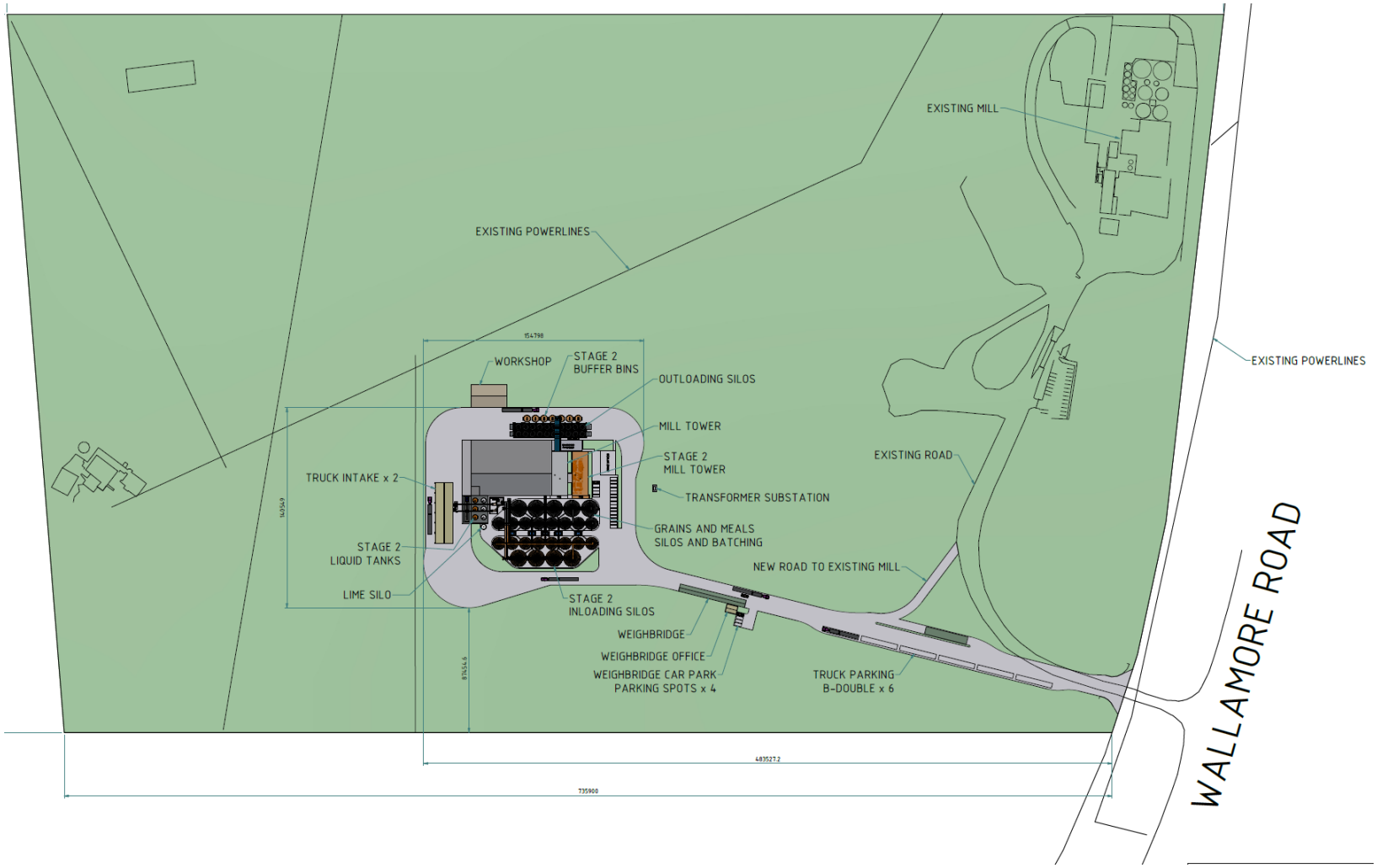
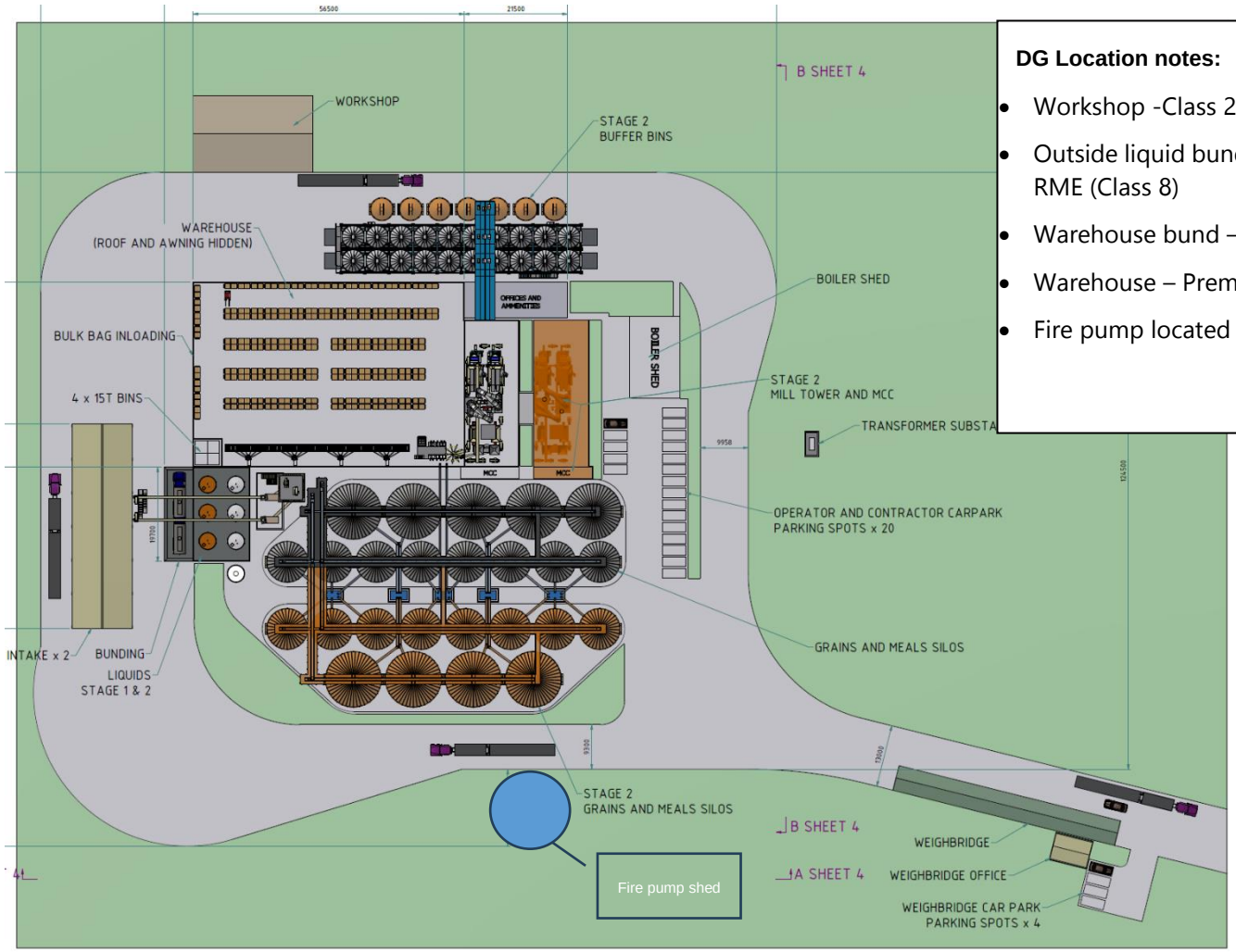


Figure 4-4 – Proposed Site Layout - overall



DG Location notes:

- Workshop -Class 2,3 &9
- Outside liquid bund area – Sal Curb RME (Class 8)
- Warehouse bund – Sal Curb RME
- Warehouse – Premixes
- Fire pump located shed – diesel

Figure 4-5 – General Layout Plan for the proposed Mill

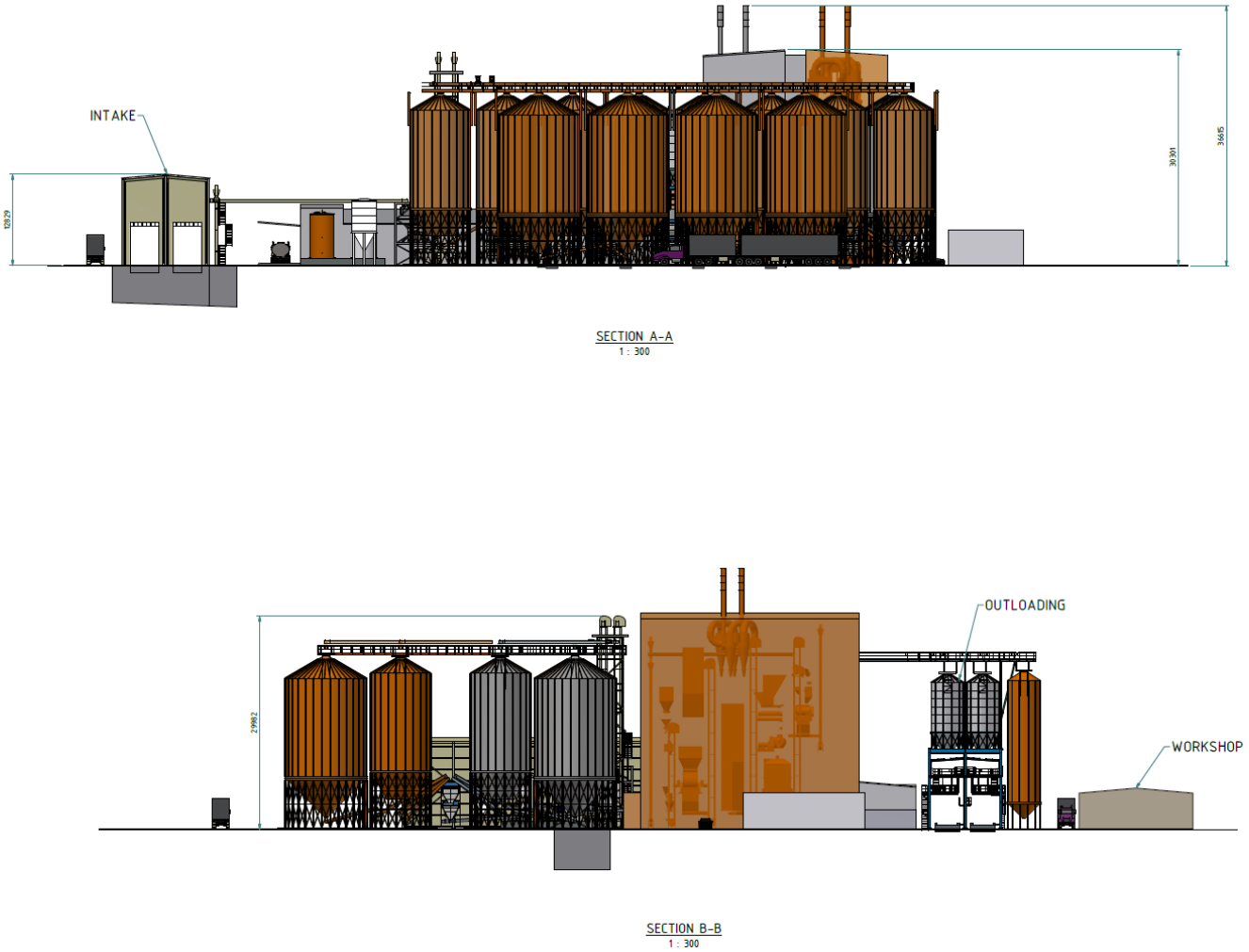


Figure 4-6 –Proposed Site Layout Plan - Elevation

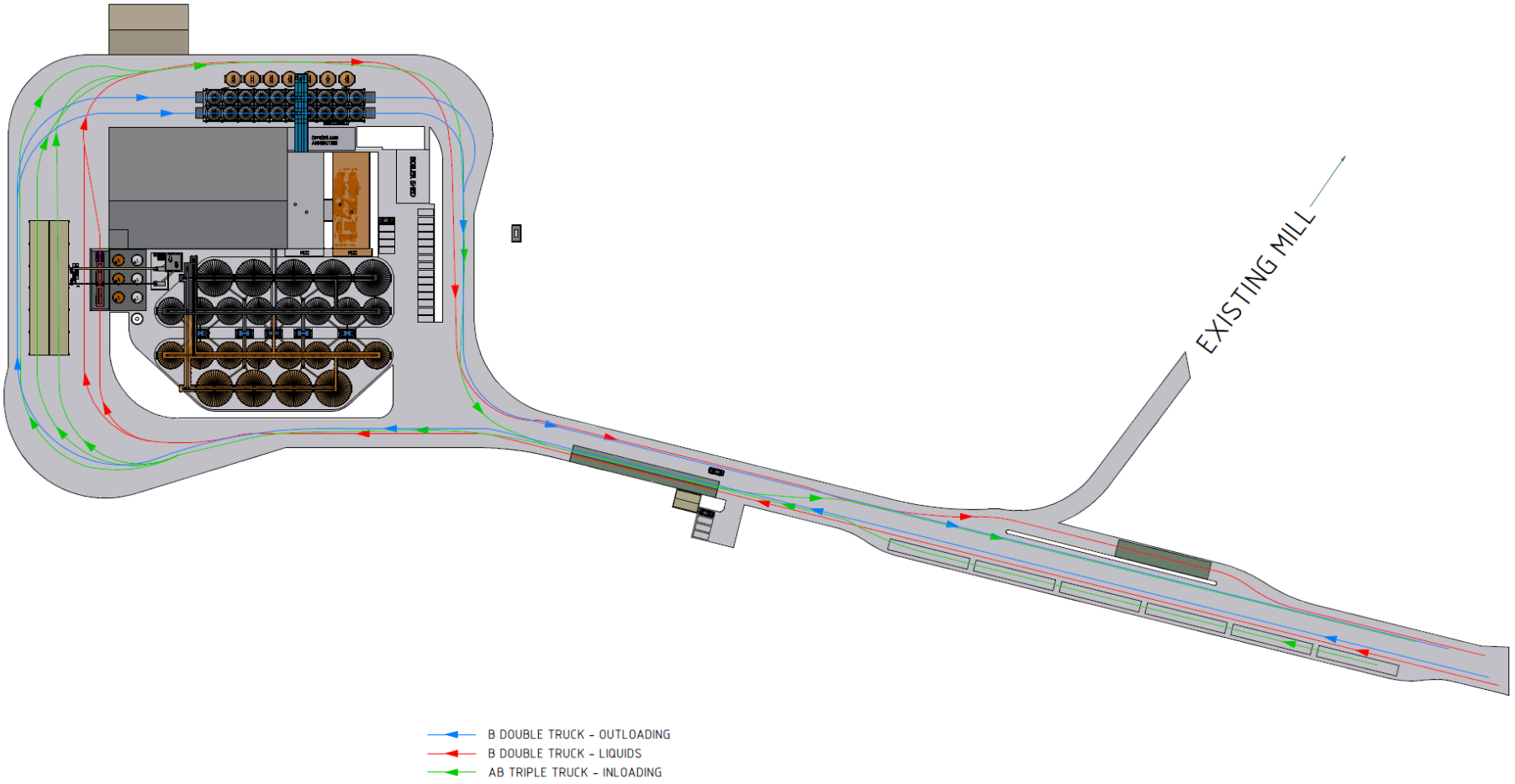


Figure 4-7 – Site proposed traffic flow

Process Flow:

The milling process broadly involves the following processing steps:

a) Grains are brought to the site and bulk stored in grain bunders and/or silos prior to processing.

b) Grains are hammer milled into the consistency of a meal.

c) Protein meals area added, and the ingredients mixed.

d) The mixed ingredients are pelletized.

e) The pellets are coated with an enzyme to aid digestion.

f) The finished pellets are transferred to the out-loading bins for collection and transportation to farms.

The feed mill process flow diagram (PFD) is presented in Figure 4-8.

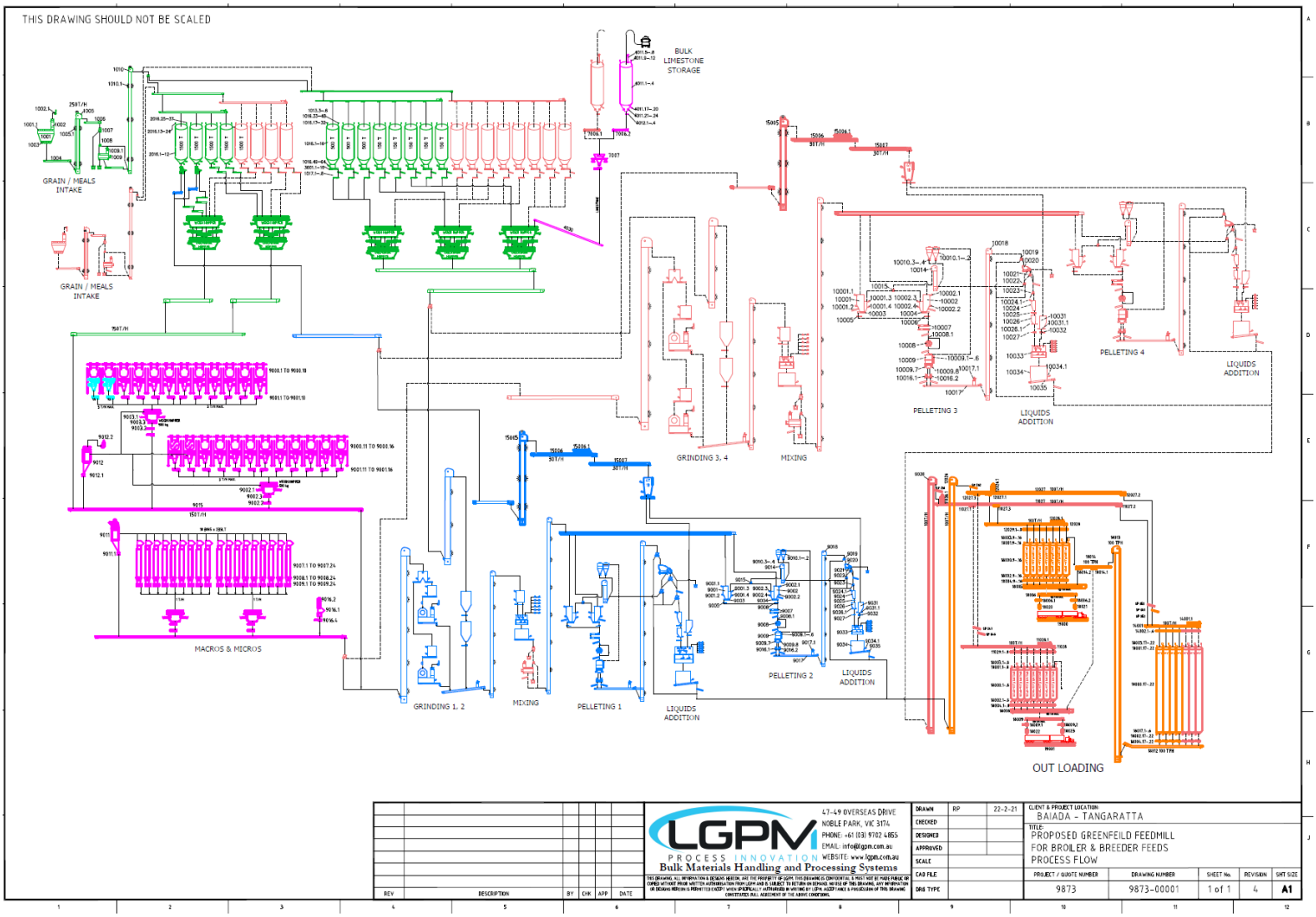


Figure 4-8 – Feed mill process flow diagram.

4.3 Site Layout Review

Provided in Table 4-1 is a discussion of each of the DG storage areas for potential for impacts on surrounding areas or to be impacted by adjacent areas.

Table 4-1 - Site Layout Review

SL no	Storage Area	Discussion
1	Chemical Shed – Area 2/amenities	Mostly Class 9 and minor quantities of Class 2.1, 2.2 gas cylinders and Class 3 materials are stored in this area. It is located at the northwest corner of the facility, near the proposed Warehouse. This area is also used for storing 20,000 L of Class 8 Corrosive *Sal Curb RM E* in IBCs. Based on the proposed location and inventory - it is concluded that the potential for offsite impact is not credible. Thus the location is satisfactory.
2	Area 2/Bunding area 1	16 x 870 L of Class 8 Corrosive *Sal Curb RM E* stored in this bunded area. It is located at the west middle, bunded area of the facility. Based on the proposed location and inventory, it does not pose any significant onsite and offsite threat. Thus, the location is satisfactory.
3	Area 2/Bunding area 3	16 x 870 L of Class 8 Corrosive *Sal Curb RM E* stored in this bunded area. It is located at the west middle of the facility. Based on the proposed location and inventory, it does not pose any significant onsite and offsite threat. Thus, the location is satisfactory.
4	Area 6/Firewater Pump Shed	The firewater pump is located in the southeast of the site, at the entrance, setback from the building and site boundaries only 40 L diesel is stored for driving firewater pump. Diesel is a combustible liquid which makes it difficult to ignite as it does not emit flammable vapours. Furthermore, only 40 L of diesel will be stored in that area, which will be in integrally bunded tanks to reduce the potential for loss of containment and uncontrolled pool sizes. Based on the proposed location and minor quantity, it is not considered to have a potential for offsite impact or onsite significant incident. Thus, the proposed location is satisfactory.
5	Transformer Substation	A transformer will be installed an isolated area, at least approximately 10 m away from the boundary of the main feed mill and proposed Operator and contractor car park. Moreover, it will be designed to AS 2374.8:2000 – Power Transformers – Application Guide and installation would be done as per the AS 2067:2016 [10]. **Recommendation**: Confirm that the distance between the proposed transformer location and any building/structure will comply with the requirement of Table 6.1 of AS 2067:2016. An extract of this provided in Table 4-2.

SL no	Storage Area	Discussion
6	Perimeter Access	The facility proposed for complete perimeter access enabling fire brigade intervention from any section of the site or to setup fire-fighting appliances in proximity to any fire sources.
7	Fire services, Entry and egress	The pump house, and booster system are located in the Southeast corner of the site, away from the building and warehouse areas. Incidents arising in the building and warehouse are not expected to impact these systems ensuring these are available to emergency responders. The site has an existing driveway to Wallamore Road that will be reused as part of this development application. A detailed traffic impact assessment is prepared for the project and submitted as part of the EIS [9]. A copy of the proposed traffic flow is provided in Figure 4-7.
8	Workshop	The Workshop may have some hazardous activities such as hot work, painting, decanting and mixing of chemicals, etc. In case of a fire event in the Workshop, there is a potential for escalating it towards the nearest facility, especially if there is any common wall. The proposed workshop is at the northwest corner of the site, isolated from the other part of the mill, thus location is satisfactory.
9	Warehouse	The Warehouse will store hazardous materials, which is located at the northern corner of the site. Designated racking and separation and segregation will be provided from non-DG bulk bags. Thus, location does not pose any significant risk.
10	Car park	The location of current proposed carpark is at the eastern boundary of the proposed facility. The car park is proposed to have access separately from the primary heavy vehicle movement areas. Thus, the location of the proposed carpark is satisfactory.
11	Site Main admin building/offices and amenities	To accommodate the employees onsite, an office and amenities area will be provided at the Northern part of the facility, which is isolated (separated and segregated) from other buildings, warehouse and process equipment. Staff car parking will be accommodated via the construction of a 20 X car parking area at the Eastern boundary iof the mill and will have its access separately from the primary heavy vehicle movement areas. No issue identified for the proposed location.
12	Site process equipment. e.g., silos, mill tower, Tanks	Not assessed in this report.

Table 4-2 - An extract of Table 6.1 of AS 2607:2016

TABLE 6.1

CLEARANCES FOR OUTDOOR TRANSFORMERS

Transformer type	Liquid volume	Clearances to other transformers or equipment	Clearances to buildings		
		Horizontal separation G_1 to other transformers or non-combustible surfaces	Horizontal clearance G_2 to combustible surfaces	Horizontal clearance G_3 to 2 hour fire resistant surfaces of buildings	Vertical extent G_4 for 2 hour fire resistant surfaces of buildings
	L	m	m	m	m
Oil-insulated transformers (O)	100 ≤1000	1	6	1	4.5
	>1000 ≤2000	3	7.5	1.5	7.5
	>2000 ≤20 000	5	10	4.5	15
	>20 000 ≤45 000	10	20	7.5	30
	>45 000 ≤60 000	15	30	7.5	30
	>60 000	23	30	7.5	30
Less combustible liquid-insulated transformers (K) without enhanced protection	100 ≤1000	1	6	1	4.5
	>1000 ≤38 000	1.5	7.5	1.5	7.5
	>38 000	4.5	15	4.5	15
Less combustible liquid-insulated transformers (K) with enhanced protection (refer to Note 1)	Clearance G_1 to other transformers or building surfaces				Vertical extent G_4 for 2 hour fire resistant surfaces of buildings
	Horizontal m				Vertical m
	0.9				1.5
Dry-type transformers (A) Fire behaviour class F_0	1.5				3.0

4.4 Population

The feed mill requires the flexibility to operate up to 24 hours a day and 7 days a week in order to respond to periods of demand. It is anticipated that the project will provide 22 full time equivalent (FTE) positions at full operation. The existing feed mill provides 15 full time equivalent (FTE) positions. During Stage 1 of the development the existing mill will require 10 FTE's and the new mill will require 12 FTE's. Upon completion of Stage 2 the new mill will require a total of 22 FTE's.

To accommodate the employees onsite, an office will be provided adjacent to the incoming weigh station. Staff car parking will be accommodated via the construction of a car parking area adjacent to the proposed office and will have its access separately from the primary heavy vehicle movement areas.

Heavy vehicles access to the site is integral to providing efficient access to ingredients and distribution to end users. All access to the site will be achieved via the existing driveway connecting to Wallamore Road.

The future residential population in the Tangaratta or Wallamore would not be affected by the proposed development. The nearest residential dwellings are located ~310m to the North, 530m to the West, 690m to the Northeast and 710m to the East of the proposed feed mill, refer to Figure 4-3.

No offsite impact determined in this PHA Study.

4.5 Quantities of Dangerous Goods Stored and Handled

Provided in Table 4-3 is a summary of the DG classes and quantities that are proposed to be stored at the mill.

Table 4-3 - Proposed Dangerous Goods to be Stored (Sourced Site hazardous materials manifest)

Baiada

Form

Emergency Hazardous Chemical Manifest

CONTROLLED

Site: TANGARATTA STOCKFEEDS	**Date Last Updated: 13/1/23**
Emergency Contact: PAUL MCGIVERN	**Telephone (24hr): 0408 118 042**

Store Location: WAREHOUSE						
Map ID – Product Type* AREA 1 Warehouse	**UN***	**DG Class/GHS Classification**	**PG**	**Type**	**Maximum Quantity ~**	**Store Cat #**
Baiada Med Bdr Lyr M220/TF Tng	3077	9	3	N/A	5mt	s
Baiada Universal Free Range U1000/CC	3077	9	3	N/A	5mt	S
Broiler Starter F100/TH	3077	9	3	N/A	5mt	S
Broiler Grower F110/TI	3077	9	3	N/A	5mt	S
Broiler Finisher F120/TH	3077	9	3	N/A	5mt	S
Broiler Withdrawal F130/TG	3077	9	3	N/A	5mt	S
Breeder Rearer B210/TR	3077	9	3	N/A	5mt	S
Breeder Layer M220/TG	3077	9	3	N/A	5mt	S
LPG GAS on Forklift	1075	2	N/A	N/A	15kgs	S
Compressed Oxygen	1072	2.2	N/A	2S	★	S

Store Location: Chemical Shed						
Map ID – Product Type* AREA 2 Shed/Amenities	**UN***	**DG Class/GHS Classification**	**PG**	**Type**	**Maximum Quantity ~**	**Store Cat #**
Enamel Paint	1950	2.1	N/A	2YE	8 lt	S
Aerostart	1950	2.1	N/A	2YE	500g	S
Sprayed marking paint	1950	2.1	N/A	2YE	12 x 500g	S
Line marking paint	1950	2.1	N/A	2YE	12 x 500g	S
Duragal aerosol	1950	2.1	N/A	2YE	500g	S
Gel - Tac	1950	2.1	N/A	2YE	6 x 350g	S

Store Location: Chemical Shed						
Map ID – Product Type* AREA 2/ Ammenities	**UN***	**DG Class/GHS Classification**	**PG**	**Type**	**Maximum Quantity ~**	**Store Cat #**
Fulafoam	1950	2.1	N/A	2YE	500g	S
Soudafoam Gap filler	1950	2.1	N/A	2YE	600ml	S
Touch up Colours	1950	2.1	N/A	2YE	2kg	S

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★**Notes:**

1. 2 X Oxygen E size bottles 4.1m^3 or 40 kgs each
2. It is noted that the primary Class 8 Dangerous Good stored on site is Sal Curb Rm E with a maximum proposed storage of 5,000 L in 5 IBC units. The quantity listed on the manifest is the maximum volume of the storage containers that could fit within the bunded area. The Client has confirmed that only the Sal Curb Rm E is the Class 8 Dangerous Good and that Sal Curb is not proposed to be kept on site at this stage.

Galmax SG Silver	1950	2.1	N/A	2YE	400g	S
Dy-Mark Spray colours	1950	2.1	N/A	2YE	3.5kg	S
GelTac	1950	2.1	N/A	2YE	700g	S

Store Location: Chemical Shed						
Map ID – Product Type* **AREA 2/Ammenities**	**UN***	**DG Class/GHS Classification**	**PG**	**Type**	**Maximum Quantity ~**	**Store Cat #**
Rust Converter	1950	2.1	N/A	2YE	400g	S
Contact Adhesive	1133	3	N/A	3YE	700g	S
Rust not Colour range	1950	3	N/A	3YE	1.6Kgs	S
Unleaded Petrol	1203	3	2	3YE	60L	S
Diesel	3082	9	3	3YE	40L	S
Contact Adhesive	1133	3	N/A	3YE	700g	S
Galmax SG Silver	1950	2.1	N/A	2YE	400g	S
Touch up Colours	1950	2.1	N/A	2YE	2kg	S
Soudafoam Gap filler	1950	2.1	N/A	2YE	600ml	S

Store Location: Chemical Shed						
Map ID – Product Type* **AREA 2/Amenities**	**UN***	**DG Class/GHS Classification**	**PG**	**Type**	**Maximum Quantity ~**	**Store Cat #**
Galmet Duragal	1263	3	3	3YE	18L	S
Rust not paint	1263	3	2	3YE	4L	S
Structural primer	1263	3	2	3YE	4L	S
Hydrochloric Acid 33%	1789	8	2	2R	15L	S
Dy-Mark Alkyd Chloroubber Fastdry Roadmarker	1263	3	3	3YE	20L	S
Parts Washing Solvent	1223	3	3	3YE	20L	S
Kerosene	1223	3	3	3YE	2L	S
Sal Curb RM E	2209	8	3	2X	20000L	S
Dy-Mark Spray colours	1950	2.1	N/A	2YE	3.5kg	S

Bajada

Form

Emergency Hazardous Chemical Manifest

CONTROLLED

Store Location: Bunded Area						
Map ID – Product Type* AREA 2/Bunding Area 1	UN*	DG Class/GHS Classification	PG	Type	Maximum Quantity ~	Store Cat #
Salcurb	2209	8	III	2X	16 x 870 ltr	S

Store Location: Bunded Area						
Map ID – Product Type* AREA 3/ Bunding Area 3	UN*	DG Class/GHS Classification	PG	Type	Maximum Quantity ~	Store Cat #
Salcurb	2209	8	III	2X	16 x 870 ltr	S

Store Location: Fire Pump Shed						
Map ID – Product Type* AREA 6/ Fire Pump Shed	UN*	DG Class/GHS Classification	PG	Type	Maximum Quantity ~	Store Cat #
Diesel	3082	9	3	3YE	40L	S

+The UN number shown refers to the largest type of DG stored in the store, other DGs with UN numbers are not shown on this table. Refer to each store's register.

~The maximum Quantity used is based on either the current Manifest received from the relevant Regulatory Authority or a recent assessment of the stores maximum capacity

#Store cat refers to the WHS Regulation Sch 11 classification of stores: M=Manifest level, P=above Placard level and S=minor store *below placard level)

*The Map ID refers to the store location on the site based on the depot ID's.

Product type is a brief and broad description of the types of chemicals stored in that store

^C2 combustible liquids are not DGs nor GHS chemicals, but are covered under AS1940

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4.6 Determination of a MHF

Schedule 15 of the NSW Work Health and Safety (WHS) Regulations 2017 [11] established the process for determination of a hazardous chemical's storage and handling facility as a major hazard facility (MHF). Where more than one class of dangerous goods are stored and handled at the site an aggregation formula should be (AQR) used. This ratio is calculated using **Equation 4-1:**

$$AQR = \frac{q_x}{Q_x} + \frac{q_y}{Q_y} + [\ldots] + \frac{q_n}{Q_n}$$ **Equation 4-1**

Where:

x,y […] and n are the Sch 15 Materials present

q_x, q_y, […] and q_n is the total quantity of Sch 15 x, y, […] and n present.

Q_x, Q_y, […] and Q_n is the individual threshold quantity for each Sch 15 of x, y, […] and n

Where the ratio AQR exceeds a value of 1, the site would be considered a MHF. The threshold quantities for each class have been taken from Schedule 15 of the NSW Work Health and Safety (WHS) Regulations 2017 [11]. These are summarised in Table 4-4.

Table 4-4 - Major Hazard Facility Thresholds

Schedule 15 [11] **Hazardous Chemical Name Or Properties**	**Un No**	**PG**	**Quantity (tonnes)**		**AQR**
			Threshold	**Proposed Storage**	
LP gases (Class 2.1)	1075	n/a	200	0.015	0.000075
Oxygen	1072	n/a	2000	0.080	0.00004
Various Compressed or liquefied gases of Division 2.1	1950	n/a	200	~0.027	0.000135
Liquids that meet the criteria for Class 3 Packing Group II or III	1133, 1203, 1263, 1223	II & III	50,000	0.131*	0.00000262
				Total	**0.00025262**

*Assume liquid density average 1,000 kg/m^3

The AQR is less than 1; hence, the facility would not be classified as an MHF. The site will not exceed 10% of the MHF. Hence, the site is not required to notify SafeWork NSW of a potential MHF in accordance with Schedule 15 of the NSW Work Health and Safety Regulation 2017 [11].

5.0 Hazard Identification

5.1 Introduction

A hazard identification table has been developed and is presented in Appendix A. This table has been developed following the recommended approach in in Hazardous Industry Planning Advisory Paper No. 6, Hazard Analysis Guidelines [2]. The Hazard Identification Table provides a summary of the potential hazards, consequences, and safeguards at the site. The table has been used to identify the hazards for further assessment in this section of the study. Each hazard is identified in detail and no hazards have been eliminated from assessment by qualitative risk assessment prior to detailed hazard assessment in this section of the study.

In order to determine acceptable impact criteria for incidents that would not be considered for further analysis due to limited offsite impact, the following approach has been applied:

a) ***Fire Impacts*** - It is noted in Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 [1] that a criterion is provided for the maximum permissible heat radiation at the site boundary (4.7 kW/m^2) above which the risk of injury may occur and therefore the risk must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk, for this study, incidents that result in a heat radiation less that at 4.7 kW/m^2 at the site boundary are screened from further assessment.

   Those incidents exceeding 4.7 kW/m^2 at the site boundary are carried forward for further assessment (i.e., frequency and risk). This is a conservative approach, as HIPAP No. 4 [1] indicates that values of heat radiation of 4.7 kW/m^2 should not exceed 50 chances per million per year at sensitive land uses (e.g., residential). It is noted that the closest residential area is more than ~300 m from the site. Hence, by selecting 4.7 kW/m^2 as the consequence impact criteria (at the adjacent site boundary) the assessment is considered conservative.

   Level 1 hazard identification at Appendix A does not identify any credible heat radiation scenario because of minor quantity of DG. Thus, no further assessment is required.

b) ***Explosion*** **-** It is noted in HIPAP No. 4 [1] that a criterion is provided for the maximum permissible explosion overpressure at the site boundary (7 kPa) above which the risk of injury may occur and therefore the risk must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk, for this study, incidents that result in an explosion overpressure less than 7 kPa at the site boundary are screened from further assessment.

   Level 1 hazard identification at Appendix A identified dust explosion risk in the proposed facility risk. Thus, further assessment is required.

c) ***Toxicity*** – Toxic substances have not been proposed to be stored at the site. However, toxic products may be formed as a result of incomplete combustion of DGs, or other materials stored on site. Hence, toxicity has been included within the assessment.

d) ***Property Damage and Accident Propagation*** - It is noted in HIPAP No. 4 [1] that a criterion is provided for the maximum permissible heat radiation / explosion overpressure at the site boundary (23 kW/m^2 / 14 kPa) above which the risk of property damage and accident propagation to neighbouring sites must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk of incident propagation, for this study, incidents that result in a heat radiation less than 23 kW/m^2 and explosion overpressure less than 14 kPa at the site boundary are screened from further assessment. Those incidents exceeding 23 kW/m^2 or 14 kPa at the site boundary are supposed to carried forward for further assessment with respect to incident propagation (i.e., frequency and risk).

Appendix A does not identify any credible scenario, which could produce 23 kW/m^2 but dust explosion scenario require further assessment.

e) ***Societal Risk*** – HIPAP No. 4 [1] discusses the application of societal risk to populations surrounding the proposed potentially hazardous facility. It is noted that HIPAP No. 4 [1] indicates that where a development proposal involves a significant intensification of population, in the vicinity of such a facility the change in societal risk needs to be taken into account.

In the case of the Tangaratta Stockfeeds Pty Limited proposed facility, there is currently no significant intensification of population around the proposed site. Therefore, societal risk has not been considered in this the assessment.

5.2 Properties of Dangerous Goods

The type of DGs and quantities stored and used at the site is described in Section 4.5. Table 5-1 - provides a description of the quantities of DGs stored and handled at the site, including the Class and the hazardous materials properties of the DG Class.

Table 5-1 - Properties of the Dangerous Goods and Materials Stored at the Site

Class	Hazardous Properties
Class 2.1 – Flammable Gas	Class 2.1 includes flammable gases which are ignitable when in a mixture of 13 per cent or less by volume with air or have a flammable range with air of at least 12 percentage points regardless of the Lower Flammable Limit (LFL). Ignited gas may result in explosion or flash fire. Where gas released under pressure from a hole in a pressurised component is ignited, a jet fire may occur. Class 2.1 materials proposed to be stored in the facility is a minor quantity. Most credible scenario is leaking from a LPG cylinder and jet fire on a cylinder head until all gas burn out or pressure neutralised. This incident will only be for a short duration and impact will be localised. As such there will not be any significant fire, which has potential for an offsite impact. The scenario is not assessed further.
Class 3	Class 3 flammable liquids are substances that can easily ignite and burn at ambient temperatures. Their hazardous properties include. • *Flammability*: Class 3 flammable liquids have low flash points, meaning they can ignite readily at relatively low temperatures. This makes them highly flammable and poses a significant fire hazard. • *Vapor Formation*: These liquids can evaporate easily, forming flammable vapors that can travel long distances and ignite when exposed to a flame, spark, or heat source. • *Ignition Source Sensitivity*: Flammable liquids can easily ignite from various sources such as open flames, sparks, hot surfaces, static electricity, or even friction. • *Rapid Spread of Fire*: Once ignited, these liquids can fuel and accelerate fires quickly due to their high flammability, potentially leading to large and difficult-to-control fires. Class 3 materials proposed to be stored in the facility is a minor quantity, all together only 131 L. Storage will be done in small containers such as 20 L drum. Any potential loss of containment will be in minor quantity and if ignited, fire will be contained within the boundary of a building. As such there will not be any significant fire, which has potential for an offsite impact. The scenario is not assessed further.
Class 8	Class 8 substances are highly corrosive, capable of causing severe chemical burns upon contact with skin, eyes, or mucous membranes. They can also corrode and damage metals, plastics, and other materials. Some Class 8 substances may react violently with water, air, or other chemicals, releasing heat, gases, or toxic fumes. These reactions can pose additional hazards, such as fire or explosion. There will not be any Class 8 packing group (PG) I or GHS acute skin hazard Category 1 corrosive material proposed to be stored on site. All proposed materials are either PG II or III, which has comparatively less capability for harm.

Class	Hazardous Properties
	The proposed single largest inventory of Class 8 Corrosive (except Class 9) that will be stored in the facility is *Sal Curb RM E* in the Chemical Shed Area 2. Loss of containment of *Sal Curb RM E* will be contained in the secondary containment bund. This material does not pose any acute inhalation risk; thus, vapor dispersion and offsite impact is not feasible. However, this risk assessment considered one step further (conservative approach) and assessed risk of any offsite impact because of incomplete combustion of *Sal Curb RM E* and any potential for emission of combustion toxic plume.
C1 - Diesel	Diesel is typically a mixture of hydrocarbons (paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C9 to C25 range) and is typically modelled as n-Dodecane (C12) in the analysis. The facility proposed to store only 40L of Diesel for the firewater tank. It will be contained in a purpose-built tank. Thus, escalation risk is not credible.

Note: Oxygen (only 2 cylinders) and Class 9 excluded as risk is negligible.

5.3 Hazards Identification

A hazard identification register has been compiled, detailing the consequences of identified hazards and the safeguards incorporated into the design to prevent and mitigate these risks. This register is included in Appendix A, which has determined that, apart from natural hazards such as earthquakes, bushfires, and lightning, the only hazard with potential for offsite impact or onsite major event risk is dust explosion, primarily due to the storage and handling of silos and hoppers.

All DGs stored in the facility is minor quantity. Thus, the duration of release would be lesser than the period of exposure required for an adverse effect on people and the time required for each representative release case to reach steady state. Therefore, it is not credible to conduct a release modelling for this smaller quantity of DG.

However, the study considered impact of toxic products of combustion, which may be formed as a result of incomplete combustion of DGs, or other materials stored on site. Hence, toxicity from the combustion of DG materials is further assessed.

There is no Class 6.1 Toxic or any other DG in the facility, which has potential for release of toxic product of combustion. The single largest inventory of Class 8 Corrosive proposed to be stored in the facility is *Sal Curb RM E* , in the Chemical Shed Area 2 (excluding Class 9).

5.3.1 Dust fire and explosion

Fine dust will be present within the manufacturing area of the facility, especially in the silos, hoppers as part of the processing operations (e.g., starch and corn dust). Although not classified as a dangerous good, this dust may burn on the surface of equipment/components or in the form of a dust cloud, resulting in a fire.

To prevent dust accumulation, equipment processing dust is ventilated using a dust extraction system. The proposed system will be in compliant with AS/NZS 60079.10.2:2016 and AS/NZS 60079.14:2017, minimizes ignition sources in hazardous areas. Dusts are mixed with non-combustible products to reduce combustibility. While there's a small risk of combustible dust igniting, any resulting fire would be localized and easily controlled with firefighting equipment. As the extraction system shuts off during a fire, preventing fuel addition, no serious incidents are expected, warranting no further analysis for offsite impacts.

A separate study was conducted for dust specific hazardous area classification by EDC Electrical design and construction [3].

Combustible dust can lead to a dust explosion if ignited within a confined system. The following five criteria must be present for an explosion to occur:

- Oxygen,
- Confinement,
- Dispersion,
- Ignition source.

When a dust cloud ignites within a congested space, such as a storage silo, it leads to a rapid increase in pressure within the enclosure. Individuals in close proximity to the exploding facility or inside the affected area are at risk of severe injury or fatality due to the sudden collapse of structures or infrastructure failure.

As per the dust specific hazardous area classification conducted by EDC Electrical design and construction [3], the following specific dust release points identified, where dry ingredients are added.

(a) Bulk grains and meals are delivered in by truck intake pits and conveyed through to bulk silos.

(b) The grains and some meals are conveyed into weigh hoppers which supply measured quantities of various combinations into discharge hoppers ready to be delivered to the grinding equipment.

(c) Other meals are conveyed into weigh hoppers which supply measured quantities of various combinations into discharge hoppers ready to be delivered to mixing via the Limestone and micro/macro delivery points.

(d) Limestone is blown into an 80T storage silo from a tanker truck and combined with meals, macros & micros in a drag conveyor before being conveyed into the mixing section. Limestone dust is not explosive.

(e) Macro and micro ingredients are delivered in bulk bags via a weigh hopper before being conveyed into the mixing section.

(f) Once the meals and grains mix has been ground in the grinding section, they are conveyed into the mixing section.

(g) Liquids are added to the dry ingredients in the mixer and from then on, they are conveyed into the pelleting line as a wet mix.

(h) From then on, the product being handled isn't considered being capable of creating an explosive dust cloud.

Specific points of release are detailed in the *Specific Points of Release* section in reference [3].

The peak value of the maximum rate of pressure rise $(dP/dt)_{max}$, is used to calculate the dust specific explosibility characteristic called the K_{st} value, the deflagration index. The K_{st} is given by:

$$K_{st} = (dP/dt)_{max} \cdot V^{1/3}$$

Where $(dP/dt)_{max}$ has bar/sec units and V is the volume of the explosion enclosure in m^3.

Depending on the K_{st} value, dusts have been classified into various Classes, as shown in Table 5-2 [12]. The classification is based on tests in a 1 m^3 apparatus, with 10 kJ ignition source.

Table 5-2: Definition of dust explosion classes

Dust explosion Class	K_{st} (bar.m/sec)	Characteristics
St 0	0	Non-explosible
St 1	$0 < K_{st} < 200$	Weak to moderately explosible
St 2	$200 < K_{st} < 300$	Strongly explosible
St 3	$300 < K_{st}$	Very strongly explosible

The Dust Materials Schedule for the proposed facility is reported in Section 6 of the dust specific hazardous area classification conducted by EDC Electrical design and construction [3],

Table 5-3: Proposed facility dust materials properties [3]

Plant Area	Minimum Ignition Energy (MIE) with Inductance (mJ)	Rate of Pressure Rise Kst	Maximum Pressure P_{max} (bar)	Dust Explosion Class
Grains and Meals	>10	120	7.7	ST1
Bulk Bag Ingredients	10	200	10	ST1
Minor Ingredients	10	200	10	ST1

Table 5-3 shows that dust Class in the facility is ST1, i.e., weak to moderately explosible. In the absence of explosion venting, the peak overpressure has been reported to 7.7 to 10 bars [3], refers to dusts with low explosion pressure and low explosibility index. Dusts classified as ST1 have relatively low explosion severity and are considered less hazardous compared to higher classes.

Considering that the silos and hoppers are not designed as pressure vessels and can only withstand slight pressures of up to 1.5 bar, any increase in pressure during an explosion may lead to structural failure of the container, potentially resulting in a weak blast wave in the vicinity. This could cause severe damage to equipment adjacent to the container, and there is a possibility of moderate damage to nearby buildings. Additionally, individuals in close proximity to the silos or hoppers could face the risk of severe injury or fatality.

The recorded history of dust incidents, as documented in the CCPS guidelines for combustible dust hazard analysis [13], highlights that the most severe consequences typically arise from secondary explosions. These incidents occur when accumulated dust in a process area, including floors, equipment, beams, and above ceilings, is dispersed by a primary explosion and subsequently ignited. To mitigate the risk of secondary dust explosions, the primary defence is designing the process to eliminate or control dust releases and maintaining high standards of housekeeping, which the proposed feed mill will implement.

Therefore, it can be concluded that the effects of a dust explosion would be contained within the area surrounding the storage facility and would not extend to impact any land use offsite. The minimum distance to the nearest fence line is approximately 30 meters.

5.3.1.1 *Dust explosion safeguards*

The following safeguards that could prevent a dust explosion and/or minimise the effects of the explosion are implemented at the proposed facility.

(a) To mitigate the potential for dust accumulation, all dust generating areas will undergoes regular housekeeping practices.

(b) Additionally, the hazardous area classification (dust) was conducted for the facility as per the Explosives Atmospheres Standard *AS/NZS 60079.10.2:2016 Classification of areas – Explosive dust atmospheres* [3]. This process helps to minimize the potential presence of any ignition sources within the area.

AS/NZS 4745:2013 Dusts Code of practice for handling combustible dusts and *BIA report 13/97 - Combustion and explosion characteristics of dusts* are also taken into account for the classification of hazardous area (dust) [3]. To facilitate ongoing compliance, the facility operation team will implement a routine hazardous area inspection program.

(c) The dusts are mixed with non-combustible products which reduces the potential combustibility of the overall dust mix.

(d) Explosion venting panels on the silos/ hoppers will be installed to relieve the pressure rise and protect the equipment.

(e) It is assumed that the facility will be equipped with dust-sealed machinery to mitigate any potentially hazardous dust clouds contained within the equipment and do not escape into the surrounding environment. Additionally, the equipment will maintain a slight negative pressure and will be connected to a dust extraction system. It is imperative that any inspection hatches or covers are securely affixed and can only be removed with a tool. Furthermore, proper signage and procedures will be implemented to prevent the hatches or covers from being left off when the equipment is operational [3].

5.3.1.2 *Discussion*

From a land use safety planning perspective, it should be noted that if no action is taken, a potential dust explosion would not have off-site impacts, and no land use or persons outside the site boundary would be affected. The potential dust explosion would occur in a container, e.g., silo, any fragments would be contained within the facility.

The risk reduction measures listed in Section 5.3.1.1 would need to be addressed as part of NSW Work Health and Safety (WHS) Regulations 2017, as they concern worker safety.

5.3.2 Toxic products of combustion

5.3.2.1 *Fire involving Sal Curb RM E in the Chemical Shed Area 2*

As per the SDS, *Sal Curb RM E* will burn if exposed to fire, which may emit toxic and/or irritating fumes, smoke and gases, including oxidise of nitrogen, carbon monoxide and carbon dioxide [14]. The product of combustion emits in this scenario is similar to a generic building materials fire, which may have combustible or non-combustible materials.

As per the *National Institute of Public Health and the Environment (RIVM), Netherland* [15] *pg 74*; a toxic consequence modelling or the release of toxic combustion products is only relevant if a storage facility contains combustible (hazardous) substances, and the packaged (hazardous) substances contain nitrogen, sulphur, chlorine, fluorine or bromine or any other specific very toxic gas. The substances containing nitrogen, sulphur or chlorine/fluorine/bromine do not themselves have to be flammable.

5.3.2.2 *Justification*

The product of combustion plume if *Sal Curb RM E* is on fire will be generic, there will not be any emission of *Very Toxic* or *Toxic* materials as per the criteria of toxicity mandated in Table 15.3 of NSW Work Health and Safety Regulation 2017 [8]. For example,

- CO – LC_{50} inhalation (rat) – 2.065mg/L
- CO_2 – No toxicity data available.

Given the ubiquitous nature of scenarios involving Class 8 Corrosive *Sal Curb RM E* materials fire and emission of common fumes, smoke, and gases, proceeding with a consequence modelling study may not be warranted in this case. Such occurrences are common and well-understood, often resulting in plumes that do not produce highly toxic combustion byproducts. Therefore, allocating resources towards a modelling study may not yield significant insights or provide actionable recommendations beyond existing knowledge and best practices for managing fire incidents involving Corrosive materials. Instead, focusing on preventative measures, fire safety protocols, and emergency response training may be more effective strategies for mitigating risks associated with such scenarios.

Therefore, this scenario was not modelled.

6.0 Conclusions and Recommendations

The hazard identification in Section 5 and Appendix A determined the following.

(a) No members of the public in residential or vulnerable land use would be exposed to any onsite DG or consequence of a dust explosion.

(b) The proposed development does not pose any injury or fatality risk to surrounding land uses.

(c) The unconstructed (future plan) rail corridor running north / south along Wallamore Road operations would not be affected by a potential release of DG or fire event or a dust explosion from the proposed development.

(d) The vulnerability from incomplete combustion of Class 8 Corrosive Sal Curb RM E fire scenario is assessed, which concluded that there is no specific offsite impact (fatality or injury consequences) from toxic product of incomplete combustion.

Conclusions

This report has reviewed and applied the requirements of the relevant SEPP (Resilience and Hazards) threshold in order to determine whether the policy applies to the Project. The SEPP (Resilience and Hazards) screenings for storage of dangerous goods indicates that none of the hazardous material proposed to be stored onsite would exceed the SEPP (Resilience and Hazards) threshold. Thus, the development should not be classified as a '*Hazardous'* or '*Offensive'* industry.

A qualitative hazard identification was conducted for the facility to identify potential hazards that may be present at the site because of operations or storage of hazardous materials. The (Level 1) qualitative hazard identification determined that there is no offsite impact posed from the proposed site operation because of storage and handling of hazardous materials. The facility is characterised by minor individual packaged inventories of hazardous materials at atmospheric pressure. Any fire incident initiates will be for a short duration and would not pose severe escalation threat and the impact will be contained within the onsite boundary.

However, as per the SEPP (Resilience and Hazards) – other risk factors screening threshold, the proposed development is considered a 'Potentially Hazardous Industry' due to the risk of dust explosion.

A Level 2 risk assessment was conducted for the dust explosion scenario, which concluded that from a land use safety planning perspective, if no action is taken, a potential dust explosion would not have off-site impacts, and no land use or persons outside the site boundary would be affected. The potential dust explosion would occur in a container, e.g., silo, any fragments would be contained within the facility.

The risk reduction measures proposed for mitigation of dust explosion would need to be addressed as part of NSW Work Health and Safety (WHS) Regulations 2017, as they concern worker safety.

The proposed site layout and separation distances between DG storage areas and other building should enable approach of the fire by firefighting personnel. However, if entry into any building is required for firefighting, this will require self-contained breathing apparatus (SCBA) due to the potentially common combustion toxic fumes such as *CO, CO_2 and oxides of nitrogen*.

This study also considered an extended assessment to assess any offsite impacts from a toxic plume of incomplete combustion of stored dangerous goods. *Sal Curb RM E, the largest Class 8 inventory* fire scenario was assessed for incomplete combustion, which concluded that there is no significant offsite impact (fatality or injury consequences) from toxic product of incomplete combustion, other than generic product of combustion byproduct, e.g., *CO, CO_2 and oxides of nitrogen*.

The facility would also establish best practices in housekeeping and operational procedures. Given this consideration, the proposed development would not introduce any additional risk that may threaten the long-term viability of the development and its effect to the local environment.

The site would be classified as potentially hazardous due to the risk of a dust explosion. However, based on the analysis conducted, it is concluded that the risks from the proposed facility are not considered to exceed the acceptable risk criteria.

6.1 Scope of Works Arising

Based on the analysis, the following outcomes shall be implemented.

a) The Dangerous Goods requirements of the NSW Work Health and Safety Regulation 2017 shall be complied with (i.e., preparation of risk assessments for storage and handling of minor quantities of hazardous materials, etc.)

b) An audit of the dangerous goods storage design to be undertaken for compliance with relevant Codes and Standards, prior to construction of the DG storage area, e.g., Separation distance between Class 3 and 8.

c) Confirm that the distance between the proposed transformer location and any building/ structure comply with the requirements of Table 6.1 of AS 2067:2016. An extract of this is provided in Table 4-2.

d) The transformer should be in a bunded area to contain a potential pool fire due to loss of containment of transformer insulating liquid (C2). This will also prevent environment contamination as well as offsite impact.

e) Maintain adequate separation distance, minimum 1 m or a vapour barrier, between the Workshop and Warehouse Office common wall. This will prevent escalation of a fire event initiated from the Workshop and vice versa.

f) The safeguards outlined in Table of *Appendix A – Hazard Identification* shall be implemented including but not limited to:

    i. Provision of adequate personal protective equipment (PPE) for the handling of DG, e.g., chemical gloves, eye protection.

    ii. Provide adequate First Aid Kit.

    iii. Provide adequate fire protection system as per the requirement of AS and BCA, etc.

    iv. Provide designated smoking area.

    v. Operator should be trained and competent.

g) Fire protection system and essential safety measures (ESM) shall be routinely tested as per the relevant Australian Standard. e.g., AS 1851:2012.

h) An Emergency Response Plan (ERP) and Emergency Services Information Package (ESIP) shall be prepared in accordance with HIPAP No. 1.

i) To mitigate the potential for dust accumulation, all dust generating areas will undergoes regular housekeeping practices.

j) Implement regular housekeeping practices for prevention of build-up of dust.

k) Establish and maintain hazardous area classification (dust) as per the reference [3].

l) Equip facility with dust-sealed machinery to contain hazardous dust clouds.

m) Install suitable dust extraction system at the identified dust release points.

7.0 Validity and Limitations

The reader's attention is drawn to the following limitations with respect to the PHA undertaken in this report:

a) This report has been prepared in accordance with the scope of services described in the contract or agreement between Lote Consulting and the Client.

b) The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein.

c) Changes to circumstances or facts after certain information or material has been submitted may impact on the accuracy, completeness or currency of the information or material.

d) This report has been prepared solely for use by the Client. Lote Consulting accepts no responsibility for its use by other parties without the specific authorization of Lote Consulting.

e) Lote Consulting reserves the right to alter, amend, discontinue, vary or otherwise change any information, material or service at any time without subsequent notification.

f) Reports marked 'Draft' are subject to change and Lote accepts no liability pending release of the final version of the report.

g) All access to, or use of, the information or material is at the user's risk and Lote Consulting accepts no responsibility for the results of any actions taken on the basis of information or material provided, nor for its accuracy, completeness or currency.

h) Any change in building, occupant or fuel conditions from those considered in this report, or any deviation from the implementation of the fire safety strategy outlined in this report, may result in outcomes not anticipated by the proposed strategy and should be reviewed.

i) It is considered that the scope of works arising from this report and limitations of this report are read, understood and implemented. Lote shall be contacted in relation to any queries on the report content and takes no responsibility for misinterpretation of the report content by others.

j) The architectural and engineering drawings referenced or listed in this report have been utilised for purposes of formulating and assessing the site as nominated in this Report. Lote have not reviewed the drawings for compliance with the BCA, Australian Standards or the Dangerous Goods Guidelines.

8.0 References

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Appendix A – Hazard Identification Word Diagram

A1. Hazard Identification Table

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
Area 1 Warehouse (store mostly Class 9 DG various Baiada products UN3077; 15 kg LPG cylinder UN1075 and 80 kg Oxygen UN 1072. All storage is minor quantity, i.e., below Placard quantity)					
1	Warehouse internal fire	Loss of containment of LP Gas because of a) Improper handling of LPG gas cylinder, fall and valve damage – human error. Source of Ignition: a) Static discharge. b) Non-flameproof lightning	a) Jet fire on the cylinder head. It will be only a short duration fire because of low inventory. May escalate to the nearest only cylinder. b) Injury, and property damage	No	a) Trained operator b) Fire hydrants c) Fire extinguishers d) Maintenance of fire protection system e) Site emergency response plan f) Electrical systems designed and installed to relevant standards. g) Smoking in designated area only h) Hot works procedure (including permits)
2	Oxygen enriches environment.	Loss of containment of Oxygen because of	a) Isolated fire b) Human injury	No	a) Routine inspection of cylinder b) Trained Operator

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
		a) Improper handling of Oxygen cylinder, fall and valve damage – human error. Source of Ignition: a) Static discharge. b) Non-flameproof Lightning			c) Fire hydrants d) Fire extinguishers e) Maintenance of fire protection system f) Site emergency response plan g) Electrical systems designed and installed to relevant standards. h) Smoking in designated area only i) Hot works procedure (including permits)
Area 2 Chemical Shed/Amenities (Class 2.1 spray paint bottles, mostly 500 gm, only one 8 L enamel paint drum)					
3	Shed internal fire	Loss of containment of aerosol because of a) Improper handling or puncture Source of Ignition: a) Static discharge. b) Non-flameproof lightning	a) It will be only a short duration jet fire or aerosol bottle will fly away. b) Negligible consequence	No	a) Trained Operator b) Fire hydrants c) Fire extinguishers d) Maintenance of fire protection system e) Site emergency response plan f) Aerosol cans should be stored in cages.

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
4	Exposure to flammable materials	Loss of Containment: a) Vapour discharge from damage drum. b) Cleanout from a damage drum	a) Inhalation/skin absorption by operator – potentially skin and eye irritation. b) Negligible consequence as the inventory is minor and none of the materials has toxicity sub risk (Class 6.1)	No	c) Low inventory d) PPE – chemical gloves, eye protection. e) Low personnel occupancy in the warehouse area Safety shower/eyewash available close warehouse f) First aid kits are located onsite
Area 2 Chemical Shed/Amenities (Minor quantity of Class 3 flammable paint and solvent, up to 20 L drum, Class 8 corrosive Sal Curb 20,000 L)					
5	Shed internal fire	Loss of containment of flammable paint or corrosive Sal Curb because of a) Improper handling or puncture b) Damage container c) Mix storage of product and wrong handling Source of Ignition: a) Static discharge.	a) Only 20 L release will have a short duration pool fire. b) Severe injury, fatality because of exposure to corrosive Sal Curb c) Product contamination	No	a) Trained Operator b) Fire hydrants c) Fire extinguishers d) Maintenance of fire protection system e) Site emergency response plan f) Bunded area for storage of Sal Curb g) Routine inspection of DG Container h) Separation and segregation

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
6	Chemical reaction or incompatibility of other materials	a) Storage of Class 3 flammable materials close to Class 8 in the same bund and release	a) The most likely outcome is product contamination. b) Flammable another class mix will most likely behave like flammable materials. SDS confirms no vigorous reactivity	No	a) Separate storage area and separate bund – minimum segregation distance 3 m b) Procedural controls of storage and handling of DGs.
Area 2 Chemical Shed/Amenities (Minor quantity of Class 2.1 aerosol small bottle, Class 3 flammable liquid - paint and adhesive, up to 60 L of petrol, Class C1 diesel total 40 L in drum)					
7	Shed internal fire	Loss of containment of flammable because of a) Improper handling or puncture – human error b) Fall from rack/shelf, etc Source of Ignition: a) Static discharge. b) Non-flameproof Lightning	a) It will be only a short duration fire because of less inventory. b) Injury or property damage	No	a) Trained Operator b) Fire hydrants c) Fire extinguishers d) Maintenance of fire protection system e) Site emergency response plan
Area 2/ Bunded Area 1: 16 X 870 L of Class 8 PG III Corrosive - Sal Curb					
8	Exposure to Corrosive materials	Loss of Containment: a) Vapour discharge from damage drum.	a) Inhalation/skin absorption by operator – potentially skin and eye irritation. As per the SDS – Acute toxicity risks	No	a) PPE – chemical gloves, eye protection.

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
		b) Cleanout from a damage drum c) Improper handling or puncture – human error	• Oral Cat 3 • Dermal Cat 3 • Inhalation Cat 2 • Skin Corrosion Cat 1B		b) Low personnel occupancy in the warehouse area Safety shower/eyewash available close warehouse c) First Aid Kits are located onsite. d) Spills clean out operating procedure and trained operator e) Site emergency response plan
Area 3/ Bunded Area 3: 16 X 870 L of Class 8 PG III Corrosive - Sal Curb					
9	Exposure to Corrosive materials	Loss of Containment: a) Vapour discharge from damage drum. b) Cleanout from a damage drum c) Improper handling or puncture – human error	a) Inhalation/skin absorption by operator – potentially skin and eye irritation. As per the SDS – Acute toxicity risks • Oral Cat 3 • Dermal Cat 3 • Inhalation Cat 2 • Skin Corrosion Cat 1B	No	a) PPE – chemical gloves, eye protection. b) Low personnel occupancy in the warehouse area Safety shower/eyewash available close warehouse c) First Aid Kits are located onsite. d) Spills clean out operating procedure and trained operator e) Site emergency response plan
Area 6/ Fire Pump Shed: 40 L of Class 9 Diesel, minor quantity					

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
10	Pump room fire	Loss of containment of diesel because of a) Improper handling, refuelling - human error. b) Damage container Source of Ignition: a) Static discharge. b) Non-flameproof lightning	a) Small pool fire in pump room - it will be only a short duration fire because of low inventory. b) Property damage – loss of fire pump	No	a) Trained Operator b) Fire hydrants c) Fire extinguishers d) Maintenance of fire protection system e) Site emergency response plan f) Smoke detector and FIP
Sitewide General					
11	Vehicle Interaction	a) Vehicle movements in vicinity of personnel, b) Vehicle impact to infrastructure	a) Personal injury b) Damage to equipment	No	a) Construction management plan that includes standard traffic rules and signage. b) Traffic management plan that includes implementation of site speed limits, ensuring driver competency, fencing / bollards and positioning of batteries to minimise vehicle interaction. c) Transport of dangerous goods will comply with the requirements of the Australian Code for the

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
					Transport of Dangerous Goods by Road and Rail (the ADG Code). d) Install bollards/protective barriers around key plant areas and infrastructure. e) Ensuring driver competency through licensing and induction
12	Natural hazard Earthquake	Earthquake	a) Personal injury, b) Plant shut down	Yes– typically a large-scale external event	a) Project infrastructure will be built to relevant construction codes.
13	Natural hazard Lightning	Lightning	a) Personal injury b) Plant shut down	Yes - typically a large-scale external event	a) Project infrastructure to be constructed in accordance with electrical standards. b) Lightning TARP (Triggered Action Response Plan) to guide site personnel response before/during/after lightning storm.
14	Natural hazard	Bushfire	a) Personal injury, b) Plant shut down	Yes - typically a large-	a) The Bushfire risk assessment is in progress.

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
	Bushfire			scale external event	b) Emergency Management and Operations Plan prepared in consultation with the fire authority will be updated. c) Operational procedures relating to mitigation and suppression of bush fire relevant to the operation of the Project. d) Ensuring that there are on site fire protection systems to protect exposures. e) Design buildings and structures to appropriate codes and standards. f) Manage fuel for vehicles and machinery on site to appropriate standards. g) There is a current Vegetation Management Plan and Emergency Management Plan that will be reviewed for the proposed development.
15	External Fire (Adjacent to site)	Fire or explosion from adjacent land users	Asset damage, feed mill shut down, personal injury	No	
16	Power Transformer Fire	a) Coolant leak and ignition b) Overheating c) Earth leakage	a) Transformer fire – loss of power b) Injury to personnel in the vicinity c) Potential for escalation	No	a) Designed to AS 2374.8:2000 – Power Transformers – Application Guide

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
					b) Installation of transformer as per AS 2067:2016 c) Fire protection provided. d) Separation distance/ fire isolation of transformers
17	Transformer explosion	a) Gases generation inside transformer enclosure (hydrogen) b) Overheating of transformer and explosion from overpressure Overheating of transformer and explosion from overpressure	a) Transformer fire – loss of power b) Injury to personnel in the vicinity c) Potential for escalation	No	a) Relief valve on transformer to vent off gases. b) High temperature trip c) Separation distance/ fire isolation of transformers
18	Contact with electricity	a) Hitting underground services. b) Overhead services damaged during natural hazards; and c) Security issues with trespassers in contact with electrical lines. Hitting underground services; d) Contact with live electrical sources;	a) Personal injury / fatality b) Feed mill shut down	No	a) Implement Isolation procedures. b) Install fit for purpose electrical systems. c) Installation shall be carried out by suitably qualified electrical personnel. d) Adherence to AS 3000. e) Site and Electrical Inductions f) Follow underground utility identification protocols, including Dial Before You Dig.

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
					g) Contractor management, including: - Sign on/off registers. - Ensuring familiarity with site WHS procedures. - Appropriate permit to work procedures.
19	Security breach	Persons seeking theft of property/battery components	a) Theft of equipment Personal injury	No	a) Installation of fencing around facility and battery facility separately. b) CCTV where practical on critical infrastructure/battery units. c) Alarms/locks on battery doors. d) Inspections to monitor for potential security concerns.
20	Onsite fire – Smoke and combustion dust	Toxic products od combustion may be formed as a result of incomplete combustion of DGs or other materials stored on site	a) Personal injury due to some inhalation	Yes (See Section 5)	a) Emergency response plan – notification to neighbours. b) Fire authority – communication with general public. Further assessment conducted in Section 5

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
21	Operation of Silos	Handling or grain, feed raw materials, etc, generates combustible dust	a) Dust Explosion	May be	a) All dust generating areas will undergoes regular housekeeping practices. b) Hazardous area classification (dust) was conducted for the facility as per the Explosives Atmospheres Standard AS/NZS 60079.10.2:2016. c) The dusts are mixed with non-combustible products which reduces the potential combustibility of the overall dust mix. d) Explosion venting panels on the silos/ hoppers will be installed to relieve the pressure rise and protect the equipment. e) It is assumed that the facility will be equipped with dust-sealed machinery to mitigate any potentially hazardous dust clouds contained within the equipment and do not escape into the surrounding environment. Further assessment conducted in Section 5

ID	Hazard Scenario	Causes	Consequence/s	Potential for Offsite Impact	Identified/Recommended Safeguards
Construction Related Hazards					
22	Construction risks	General miscellaneous construction risks	a) Personal injury / fatality	No	a) Implement a Workplace Health and Safety (WHS) plan. b) Conduct a detailed Safety in Design processes during project execution.
23	Transport and delivery (manual handling)	Personnel injury though manual handling of equipment during operations	a) Personal injury	No	b) Adhere to requirement of a WHS plan and the ADG code. c) Site shall have specific equipment for manual material handling.
Note: Only the hazards that could result in an offsite impact, and those hazards that may impact on emergency service providers are analysed in detail in Section 5.					

Appendix B: Extract from '*Sal Curb RM E'* SDS

4. FIRST-AID MEASURES

Inhalation
Avoid becoming a casualty - to protect rescuer, use air-viva, oxy-viva or one-way mask. Remove affected person from contaminated area - Apply artificial respiration if not breathing. Do not give direct mouth to mouth resuscitation. Resuscitate in a well ventilated area. Seek IMMEDIATE medical attention.

Ingestion
Do not induce vomiting. Immediately wash out mouth with water (never give anything by mouth if affected person is semi-conscious or unconscious). Seek immediate medical attention.

Skin
Remove all contaminated clothing immediately. Wash gently and thoroughly with water and non-abrasive soap for 15 minutes. Ensure contaminated clothing is washed before re-use or discard. Seek immediate medical attention.

Eye contact
If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Seek immediate medical attention.

First Aid Facilities
Eye wash, safety shower and normal washroom facilities.

Advice to Doctor
Treat symptomatically.

Other Information
For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use carbon dioxide, dry chemical, foam, water mist or water spray.

Unsuitable Extinguishing Media
Do not use water jet.

Hazards from Combustion Products
Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases, including oxides of nitrogen, carbon monoxide and carbon dioxide.

Specific Hazards Arising From The Chemical
This product will burn if exposed to fire.

Hazchem Code
•2X

Decomposition Temperature
Not available

Precautions in connection with Fire
Fire fighters should wear Self-Contained Breathing Apparatus (SCBA) operated in positive pressure mode and full protective clothing to prevent exposure to vapours or fumes. Water spray may be used to cool down heat-exposed containers. Fight fire from safe location. This product should be prevented from entering drains and watercourses.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures
Remove all sources of ignition. Evacuate all unprotected personnel. Do not allow contact with skin and eyes. Do not breathe mist/vapour. It is essential to wear self-contained breathing apparatus (S.C.B.A) and full personal protective equipment and clothing to prevent exposure. Avoid exposure to spillage by collecting the material using explosion proof vacuum and transfer into suitable labelled containers for subsequent recycling or disposal. Dispose of waste according to applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water and waste management authorities in accordance with local regulations.

Appendix C: Hazardous Area Classification (Dust)

EDCelectrical
design&construction

HAZARDOUS AREA CLASSIFICATION (DUST)

BAIADA-TANGARATTA NSW, FEEDMILL

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QLD 76316 | SA PGE 269439

Revision History

Date	Rev	Rev Description	By	Reviewed	Approved
18/04/2024	-	First Issue	Faiz Aman	Peter Lade	Peter Lade

Contents

1 Purpose

Baiada are undertaking a project to build a new feedmill facility at their Tangaratta site. The ingredients used in this plant have the potential to form explosive dust clouds and/or create layers of combustible dusts which requires the consideration of hazardous areas at the site. This hazardous area zone classification (HAC) document identifies these areas.

The Wiring Rules AS/NZS 3000:2018 Section 7.7 states that *"The responsibility for the classification of a hazardous area rests with the person or parties in control of the installation"* and refers to the AS/NZS 60079 suite of standards for Explosive Atmospheres for the definition of a 'hazardous area'. As defined in AS/NZS 60079, a hazardous area is an *"area in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation, and use of potential ignition sources*".

The Explosives Atmospheres Standard *AS/NZS 60079.10.2:2016 Classification of areas – Explosive dust atmospheres* gives guidance on the identification and classification of areas where hazards from dust can arise, and this report is based on this standard's essential criteria and guidance. This report is to be read in conjunction with the related set of zone extent drawings and schedule of the materials being handled.

The scope of this report includes the following areas of the plant:

- Grain & Meal Truck Unloading, Bulk Storage & Batching
- Macro & Micro Ingredients Bins & Bulk Bag Unloading & Batching
- Limestone Truck Unloading & Storage
- Grinding
- Mixing
- Pelleting
- Whole Grain Addition
- Pelleting Liquids Addition
- Outloading

2 General

The plant will be handling the ingredients detailed in the Materials Schedule section below and will be subject to their dust.

Grain and meal dusts are well known as being hazardous in relation to dust explosions that can occur under specific conditions, in addition some of the other specialist minor ingredients used have hazardous characteristics. Therefore, the correct zoning in relation to this hazard is important to ensure the correct selection of electrical equipment to minimize the risk of ignition.

It has been assumed that the plant will be designed and supplied with dust sealed equipment such that any hazardous dust cloud will be contained inside equipment and not be released into the surrounding area. There will also be a slight negative pressure in the equipment which is connected to a dust extraction system. To allow the area around any equipment to be rated as non-zoned it is critical that any inspection hatches and/or covers be properly affixed so they can only be removed with a tool and with signage and procedures in place to ensure they are not left off when the equipment is running. Specific points of release are detailed in the Specific Points of Release section of this document.

It is to be stressed that a major risk factor in relation to dust explosions is accumulated dust, particularly inside buildings or enclosed structures. Such accumulations, once disturbed by some initial incident, have the potential to create a major explosion hazard, through "secondary explosions" that are usually the main cause of damage in explosion incidents.

Due to the risks associated with accumulated dust, the importance of controlling deposits by regular cleaning and good "housekeeping" cannot be over emphasized.

Plant maintenance is also crucial to ensure such things as flexible couplings are kept in good condition and any leaks identified quickly to prevent the creation of dust clouds and/or the build-up of dust layers.

3 Desktop Review

This assessment has been conducted as a desktop review of the process, to allow the electrical design of the plant to be completed. As such a conservative approach has been used for this stage, the plant will later be inspected during operation to ensure that the assumptions and recommendations made are in line with the actual operation.

4 References

AS/NZS 60079.10.2:2016	Explosive atmospheres – Part 10.2 classification of areas-combustible dust atmospheres
AS/NZS 4745:2013 Dusts	Code of practice for handling combustible dusts
BIA report 13/97	Combustion and explosion characteristics of dusts

5 Zone Classifications

Definitions are taken from AS/NZS 60079.10.2:2016 Section 6 "Zones".

Dust	Zone 20	A place in which an explosive dust atmosphere, in the form of a cloud of dust in air, is present continuously, or for long periods or frequently	Continuous Grade of Release in Normal Operation
	Zone 21	A place in which an explosive dust atmosphere, in the form of a cloud of dust in air is likely to occur in normal operation occasionally	Primary Grade of Release in Normal Operation
	Zone 22	A place in which an explosive dust atmosphere, in the form of a cloud of dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only	Secondary Grade of Release in Abnormal Operation

6 Materials Schedule

In the absence of recipes and data sheets that detail the materials being handled in the plant the table below has been developed based on experience from similar Feedmill plants.

The worst-case properties have been taken from a wide variety of grains and meals as well as for the minor ingredients.

The BIA 13/97 Report is a well-known industry reference for the properties of many dusts that have been tested for explosive properties and this is the basis of the Grains & Meals properties. The values below are from the worst case of Mill Run/Wheat Starch [1269], PKE [3518], Canola Meal [3363], Lupins [3534],

Barley [3014] and Wheat [3466]. The number in [square parentheses] refers to the BIA material number.

Generally, we find that it is difficult to get specific data from suppliers for specialised ingredients, such as the various vitamins, amino acids, proteins, fibre, and plant mixes used, so a conservative approach has been taken by assigning a rating of dust class ST1, temperature limit T4 and dust type IIIB. All carbonaceous organic products, including amino acids, fall within these ratings. This approach to determining the material properties doesn't change the area zoning within the plant or make the selection of hazardous rated instruments required within these areas more arduous.

Limestone dust is not explosive.

Plant Area	**Min. Ignitable Con. G/m3**	**Minimum Ignition Energy (MIE) with inductance (mJ)**	**Minimum Ignition Temp (MIT) (°C)**	**Surface Layer Ignition Temp (°C)**	**T_s(max) Surface Temp Limit (°C)**	**Rate of pressure rise – K(st)**	**Maximum Pressure – P(max) bar**
Grains and Meals	30	>10	380	290	215	120	7.7
Bulk Bag Ingredients	30	10			135	200 (ST1)	10 (ST1)
Minor Ingredients	30	10			135	200 (ST1)	10 (ST1)

7 Zone Extent Drawings

This report is to be read in conjunction hatched P&ID drawings 27083-E700 through to E704. These have been reproduced from the LGPM drawing 9873-00001 Sheet 1 revision 11.

8 Specific Points of Release

Zone classification has been performed to AS/NZS 60079.10.2:2016, and the site process drawings.

Dry ingredients are added by the following methods:

- Bulk Grains and Meals are delivered in by truck intake pits and conveyed through to bulk silos.
- The Grains & some Meals are conveyed into Weigh Hoppers which supply measured quantities of various combinations into Discharge Hoppers ready to be delivered to the Grinding equipment.
- Other meals are conveyed into Weigh Hoppers which supply measured quantities of various combinations into Discharge Hoppers ready to be delivered to mixing via the Limestone & Micro/Macro delivery points.
- Limestone is blown into an 80T storage silo from a tanker truck and combined with Meals, Macros & Micros in a drag conveyor before being conveyed into the Mixing section.
- Macro & Micro ingredients are delivered in bulk bags via a weigh hopper before being conveyed into the mixing section.
- Once the Meals & Grains mix has been ground in the Grinding section , they are conveyed into the mixing section.
- Liquids are added to the dry ingredients in the Mixer and from then on, they are conveyed into the Pelleting Line as a wet mix.
- From then on, the product being handled isn't considered being capable of creating an explosive dust cloud.

The zoning at each stage of the process is explained below. Refer to AS/NZS 60079.10.2:2016 Sections 6.2.2, 6.2.3, 6.2.4 and Annex A for further definitions and examples.

8.1 Grain & Meal Truck Unloading, Bulk Storage & Batching

Trucks dump into the intake pits producing clouds of dust around the pit. There is a dust collector drawing from the pit to ensure that most of the dust enters the pit and does not disperse further afield. It must be ensured that the dust collector is interlocked to start whenever a truck is tipping into the pit. It is assumed that the intake pit is contained within a building that is sealed during the process to prevent dust spreading outside.

The inside area of the pit and dust collector are zoned as 20, there will be dust present whenever the truck is tipping. The clean side of the dust collector is zoned as 22, there will only be dust here if the filters in the dust collector fail. A small zone 22 exists at the outlet of the filter fan, outside the building, in the event of a failure of the dust collector.

A small zone 21 (1.0m hemisphere) exists around the pit, due to the dust created from the unloading. The dust collector will collect most of the dust but there will be a small cloud above the pit for brief periods during the tip. A larger zone 22 (2.0m hemisphere) is around the pit, as a cloud will form here if the dust collector fails.

The bulk materials are then conveyed through a drum magnet and separator, then into the bulk Grain & Meal storage silos using bucket elevators and drag conveyors. Bulk grains are run through a cleaner. The bulk grains and meals are discharged from the silos using screw conveyors into the batching weigh hoppers.

The grains and meals are combined in different rations via the batch weigh hoppers and discharging through the discharge hoppers and conveyed directly to the Grinding. Meals are combined with Limestone and Macro & Micro ingredients and then conveyed to the Mixing via bucket elevators and drag conveyors.

The inside area of all duct work, the cleaners, all the silos and weigh hoppers are zoned 20 due to continuous presence of dust in a confined area during filling and emptying. Inside the bucket elevators are zoned 20 due to the significant amount of dust produced during conveying and their tendency to accumulate dust over time. Inside the drag conveyors with aspiration are zoned 21 due to the dust extraction, their relatively slow operation, and their flooded nature, therefore dust clouds are only likely to be present occasionally. Drag conveyors without aspiration are zoned 20 as dust is likely to be present continuously. Inside the screw conveyors directly under silos, is zone 21 due to its flooded nature, therefore dust clouds are only likely to be present occasionally. Other screw conveyors are zoned 20 as dust is likely to be present continuously.

The clean side of the filter bags in the dust collectors on the drag conveyors is zoned as 22, there will only be dust here if the bags in the dust collector fail. The dirty side of the filters is zoned as 20 due to the continuous presence of dust. A small zone 22 exists at the outlet of the filter fan, assumed to be outside the building, in the event of a failure of the dust collector.

8.2 Macro & Micro Ingredients Bins & Bulk Bag Unloading

Bulk bags of Macro Ingredients are emptied at discharge stations with screw conveyors then conveying them from the hopper underneath into a weigh hopper. From there the Macros are conveyed to the to the Mixing section via an aspirated drag conveyor and a bucket elevator. It is unclear as to the method used to open the bottom of the bulk bags, the worst case of the unloading station having to slit an opening

has been considered which will create an external zone around the equipment. These external zones are an area of concern due to external electrical equipment it may encompass as well as the combustion engines of forklifts used to lift the bulk bags into position.

Inside the Macro Ingredients bag is zoned 21, as a cloud may form during the shaking process. Around the bag outlet there is an external zone 21 for a radius of 0.5m with a further zone 22 extending for 0.5m outside the zone 21, this is due to the likely release of dust during the slitting operation to open the bag.

The Micro ingredients are tipped into & stored in bins before being discharged via a screw conveyor into weigh hopper.

Inside the Macros unloading hopper is zoned 20. While inside the screw conveyors is zone 21 due to its flooded nature, therefore dust clouds are only likely to be present occasionally. The clean side of the filter bags in the dust collectors is zoned as 22, there will only be dust here if the bags in the dust collector fail. The dirty side of the filters is zoned as 20 due to the continuous presence of dust. A small 0.5m hemisphere of zone 22 exists at the outlet of the filter fan, assumed to be outside the building, in the event of a failure of the dust collector.

A small 0.5m hemisphere of zone 22 exists around the inlet at the Micros tipping station due to the negative suction of its aspirator. Inside the bins is zoned 20 as the materials being handled can generate significant dust during filling and emptying. Inside the screw conveyors is zone 21 due to its flooded nature, therefore dust clouds are only likely to be present occasionally. The area around the opening of the micro bins is at heightened risk of dust accumulation. Therefore, it is important to ensure good housekeeping of the area, so dust cannot build up and causes the area to become zoned. The inside of the bucket conveyor is zoned 20 due to continuous presence of dust during its operation.

Inside the weigh bins, drag conveyors and ducts are zoned 20 due to the continuous release of dust all the time during conveying, filling, and emptying.

8.3 Limestone Truck Unloading & Storage

Limestone is introduced into the mix from bulk tankers and is blown directly into an 80T silo and combined with the Macros & Micros in the drag conveyor before being conveyed into the grinding section. Limestone doesn't form an explosive dust and so there isn't any zoning applied to equipment handling this ingredient only.

8.4 Grinding

The bulk grains and some meals are conveyed to the Grinding section by a bucket elevator and conveyors. The grains and meals received are accumulated into holding bins above the grinders. The product is then dropped to screw conveyors and fed to the hammermill. After grinding, the product is passed through a cleaner which is either directly conveyed to the mixer using a drag conveyor, or it is passed through two holding bins which are then conveyed to the mixer using drag conveyor and a bucket elevator . The drag conveyor has its own dust collector. Also, in this section some Meals, Limestone, Micro & Macros are received by two holding bins which are conveyed to the mixer using the drag conveyor and the bucket elevator.

Inside the conveyors, bins, cleaner, hammermill and bucket elevator are zoned 20 due to the continuous release of dust during conveying and grinding. Inside the drag conveyor with aspiration is zoned 21 due to the dust extraction, their relatively slow operation, and their flooded nature, therefore dust clouds are only likely to be present occasionally. The clean side of the filter bags in the dust collectors is zoned as 22, there will only be dust here if the bags in the dust collector fail. The dirty side of the filters is zoned

as 20 due to the continuous presence of dust. A small zone 22 exists at the outlet of the filter fan, outside the building, in the event of a failure of the dust collector.

8.5 Mixing

The ground mix of grains and meals are combined with the limestone, macros & micros stream at the conveyor in the Grinding section. The combined product is then lifted through the bucket elevator and dropped into the bin above the mixer.

Medication Bins are manually added via a tipping station and are added to the bin as well. From there they are dropped into the mixer where fats and enzymes are mixed with rest of the material. During this stage, all product is still dry until the liquids are added in the mixer.

Inside both the bucket elevator, duct and bins are zoned 20 due to continuous dust produced during conveying, emptying, and filling. The inside of the mixer itself is zone 22 as the only time dust can be present is if the dry ingredients are added by mistake without the injection of any liquids.

The product once leaving the mixer has a high moisture content and so the area inside the pelleting lines is unzoned.

8.6 Pelleting

The mixture from the mixer is conveyed into the pelleting lines via a screw conveyor and bucket elevator before entering the extruding and pelleting equipment via intermediate holding bins. Once the pellets are formed, they are conveyed to the Liquids Addition section.

The product arriving from the mixer has a high moisture content and so the area inside the pelleting lines is unzoned. In additional once the pellets are formed it limits the amount of dust present.

The inside of all equipment handling just the pellets is unzoned due to their formed nature.

8.7 Whole Grains

Whole grain can be directly conveyed from the Bulk Intake silos to the Liquid Additions 1 & 2 via a system of screw conveyors, drag conveyors, bucket elevator and cleaner. It is accumulated in bins above the Liquids Addition Mixer before being added as required. The grain is coated with liquid and enzymes before being conveyed to Outloading.

The internals of all the equipment handing theses grains up until the mixer is zoned 20 due to the continuous dust produced during conveying, emptying, and filling. The inside of the Liquids Addition Mixer itself is zone 22 as the only time dust can be present is if the dry ingredients are added by mistake without the injection of any liquids.

8.8 Pelleting Liquids Addition

The extruded pellets are conveyed via drag conveyors and bucket elevators into the Liquids Addition Mixer via grading equipment. Once the product enters the mixer they are coated with a layer of liquid oils and enzymes before being conveyed to outloading.

The inside of all equipment handling just the pellets is unzoned due to their formed nature. The inside of the Liquids Addition Mixer itself is zone 22 due to addition of whole grains at different times – refer to Section 8.7 above.

Once the coating has been added to the wheat and pellets there is no risk of dust from it or the pellets so inside all equipment from that point onwards is unzoned.

8.9 Outloading

The coated product is conveyed into the Outloading bins via drag conveyors and bucket elevators. Trucks are loaded via a mobile loading system made up of belt conveyors and extendable bellows.

The inside of all equipment handling the coated product is unzoned.

It has been noted on similar sites that while dust hazards in the form of explosive clouds don't exist around the outloading areas there is a tendency for dust layers to build up over time. This is the dust generated by the product rubbing together and can form significant dust layers over time which left unattended can lead to external hazardous area zoning. Therefore, is it important that the plant maintains good levels of housekeeping around the outloading equipment otherwise addition zoning will need to be applied in that area also.

9 Importance of Housekeeping

Dust as well as forming explosive clouds can accumulate over time on surfaces. These layers can be easily stirred up to form an explosive cloud, so anywhere a layer can accumulate is a potential source of release and hazard.

The sources of release and resultant zones identified throughout this report assume a good level of housekeeping around the facility and as such as only considered sources of release from equipment used to handle and store the grain and not from disturbed dust layers.

It needs to be noted that if good levels of housekeeping are not maintained then the facility would have to be re-classified and additional sources of release would be identified due to the build-up of dust layers as follows:

Where dust layers are allowed to build up to uncontrolled thicknesses the area will typically need to be classified as zone 20.

In areas where the dust layers are of a controlled thickness and the dust is considered 'disturbed often', the area will typically be classified as Zone 21.

However, if a dust layer to a controlled thickness is considered to be 'rarely disturbed' the area will typically be classified Zone 22

Additionally, if dust layers are able to form on electrical equipment they will need to be rated for a hazardous area. If layers greater than 5mm are allowed to form on electrical equipment already rated for a hazardous area, then they will need to be de-rated based on the typical maximum dust layer being allowed to form before its cleaned away. Equipment cannot be de-rated for dust layers greater than 50mm.

A Appendices

1A ***P & ID Zoning Drawings***

1B ***Certificate of Attainment***

GRAIN / MEALS INTAKE

GRAIN SILOS

MEAL SILOS

LIMESTONE SILOS

1500 T

500 T

80 T

WEIGH HOPPER

DISCHARGE HOPPER

700KG

100KG

WHOLE GRAIN ADDITION CONVEYOR
REFER SHEET 3

GRINDING 1, 2
REFER SHEET 3

MACROS & MICROS CONVEYOR
REFER SHEET 2

FUTURE GRINDING 3, 4
REFER SHEET 4

LGPM SUPPLY

FUTURE

THIS DRAWING SHOULD NOT BE SCALED

ORIGINAL FLOW DIAGRAM = LPGM 9873-00001 SHT 1 REV 11

NOTE:

* = 0.5m HEMISPHERE ZONE 22 AROUND OUTLET

\# = INTERNAL OF PIT ZONE 20. ZONE 21 FOR 1m RADIUS HEMISPHERE ABOVE PIT. ZONE 22 FOR 1m RADIUS BEYOND ZONE 21.

KEY:

- ZONE 20
- ZONE 21
- ZONE 22
- UNZONED

Rev.	Description	Drn	Ckd	App	Date
1	ISSUED FOR CONSTRUCTION	WMP	FA	PL	03.04.24

	Name	Date
Drawn	WMP	03.04.24
Design	FA	03.04.24
Checked	PL	03.04.24

Client: Baiada Group
PO Box 21
Pendle Hill
NSW 2145
Baiada

Client Name: BAIADA

Client Approval:

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www.edcelectrical.com.au

Title: BAIADA GROUP
TANGARATTA FEEDMILL
HA (DUST) ZONE CLASSIFICATION
FLOW DIAGRAM
SHEET 1 OF 5

Drawing Status: FOR CONSTRUCTION

Scale: NTS

Reference: 27083-E700

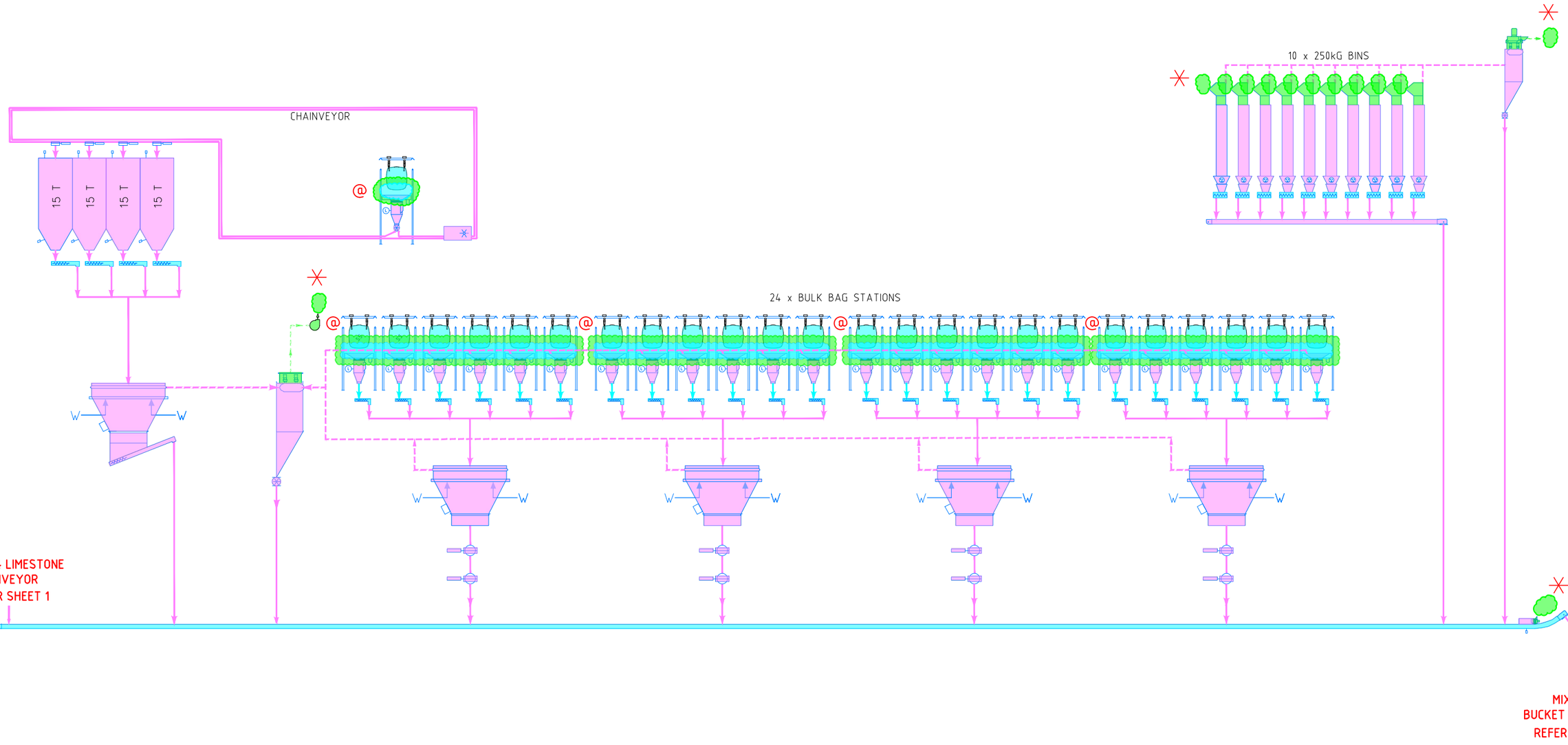
Sheet: A3

Client Drawing No.: E700

Rev.: 1

Do Not Scale - If In Doubt Ask.

MACROS & MICROS



LGPM SUPPLY

FUTURE

THIS DRAWING SHOULD NOT BE SCALED

ORIGINAL FLOW DIAGRAM = LPGM 9873-00001 SHT 1 REV 11

NOTE:

* = 0.5m HEMISPHERE ZONE 22 AROUND OUTLET

@ = ZONE 21 FOR 0.5m RADIUS AROUND THE OUTLET & ZONE 22 FOR FURTHER 0.5m DISTANCE OUTSIDE OF THE ZONE 21.

KEY:

- ZONE 20
- ZONE 21
- ZONE 22
- UNZONED

Rev.	Description	Drn	Ckd	App	Date
1	ISSUED FOR CONSTRUCTION	WMP	FA	PL	03.04.24

	Name	Date
Drawn	WMP	03.04.24
Design	FA	03.04.24
Checked	PL	03.04.24

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Client Name: BAIADA

Client Approval:

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Title: BAIADA GROUP
TANGARATTA FEEDMILL
HA (DUST) ZONE CLASSIFICATION
FLOW DIAGRAM
SHEET 2 OF 5

Drawing Status: FOR CONSTRUCTION

Scale: NTS

Reference: 27083-E701

Sheet: A3

Client Drawing No.: E701

Rev.: 1

Do Not Scale - If In Doubt Ask.

NOTE:

* = 0.5m HEMISPHERE ZONE 22 AROUND OUTLET

\# = INTERNAL OF PIT ZONE 20. ZONE 21 FOR 1m RADIUS HEMISPHERE ABOVE PIT. ZONE 22 FOR 1m RADIUS BEYOND ZONE 21.

KEY:

- ZONE 20
- ZONE 21
- ZONE 22
- UNZONED

FUTURE CONVEYOR FOR GRINDING 3, 4
REFER SHEET 4

FUTURE CONVEYOR FOR LIQUIDS ADDITION 3 & 4
REFER SHEET 4

WHOLE GRAIN ADDITION

GRAIN SILOS
REFER SHEET 1

MACROS & MICROS CONVEYOR
REFER SHEET 2

ASPIRATOR

4T

MEDICATION HAND TIP
6 BINS x 250kG

FATS

ENZYME

60TPH

DISCHARGE HOPPERS CONVEYOR
REFER SHEET 1

GRINDING 1, 2

MIXING 1

PELLETING 1
50 TPH

LIQUIDS ADDITION 1

PELLETING 2
50 TPH

LIQUIDS ADDITION 2

FUTURE OUTLOADING LINE 2
REFER SHEET 5

LINE 2

LINE 1

FUTURE OUTLOADING LINE 1
REFER SHEET 5

LGPM SUPPLY

FUTURE

THIS DRAWING SHOULD NOT BE SCALED

ORIGINAL FLOW DIAGRAM = LPGM 9873-00001 SHT 1 REV 11

Rev.	Description	Drn	Ckd	App	Date
1	ISSUED FOR CONSTRUCTION	WMP	FA	PL	03.04.24

	Name	Date
Drawn	WMP	03.04.24
Design	FA	03.04.24
Checked	PL	03.04.24

Client: Baiada Group
PO Box 21
Pendle Hill
NSW 2145
Baiada

Client Name: BAIADA

Client Approval:

EDCelectrical design&construction
VIC REC13763 ABN 31 085 651 314 NSW REC11096C
(02) 6024 6044
ELECTRICAL DESIGN & CONSTRUCTION
20 Trafalgar St, Wodonga VIC 3690 Ph: (02) 60246044 Fax: (02) 60246055
www.edcelectrical.com.au

Title:
BAIADA GROUP
TANGARATTA FEEDMILL
HA (DUST) ZONE CLASSIFICATION
FLOW DIAGRAM
SHEET 3 OF 5

Drawing Status: FOR CONSTRUCTION
Scale: NTS
Reference: 27083-E702
Sheet: A3
Client Drawing No.: E702
Rev.: 1

Do Not Scale - If In Doubt Ask.

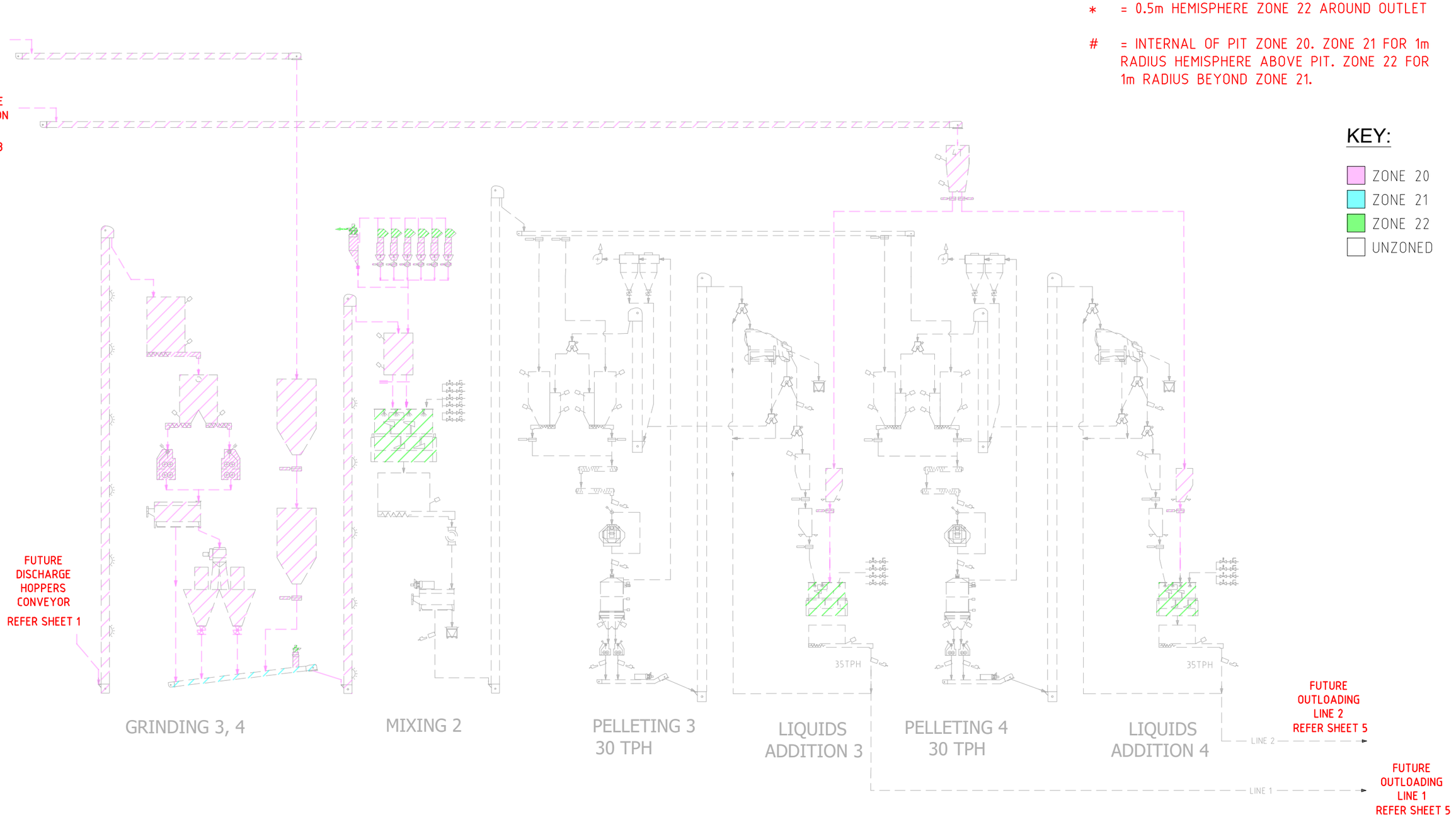
NOTE:

* = 0.5m HEMISPHERE ZONE 22 AROUND OUTLET

\# = INTERNAL OF PIT ZONE 20. ZONE 21 FOR 1m RADIUS HEMISPHERE ABOVE PIT. ZONE 22 FOR 1m RADIUS BEYOND ZONE 21.

KEY:

- ZONE 20
- ZONE 21
- ZONE 22
- UNZONED



LGPM SUPPLY

FUTURE

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ORIGINAL FLOW DIAGRAM = LPGM 9873-00001 SHT 1 REV 11

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Drawn	WMP	03.04.24
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Checked	PL	03.04.24

Client: Baiada Group, PO Box 21, Pendle Hill, NSW 2145 (Baiada)

Client Name: BAIADA

Client Approval:

EDCelectrical design&construction
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www.edcelectrical.com.au

Title: BAIADA GROUP
TANGARATTA FEEDMILL
HA (DUST) ZONE CLASSIFICATION
FLOW DIAGRAM
SHEET 4 OF 5

Drawing Status: FOR CONSTRUCTION

Scale: NTS

Reference: 27083-E703

Sheet: A3

Client Drawing No.: E703

Rev.: 1

Do Not Scale - If In Doubt Ask.

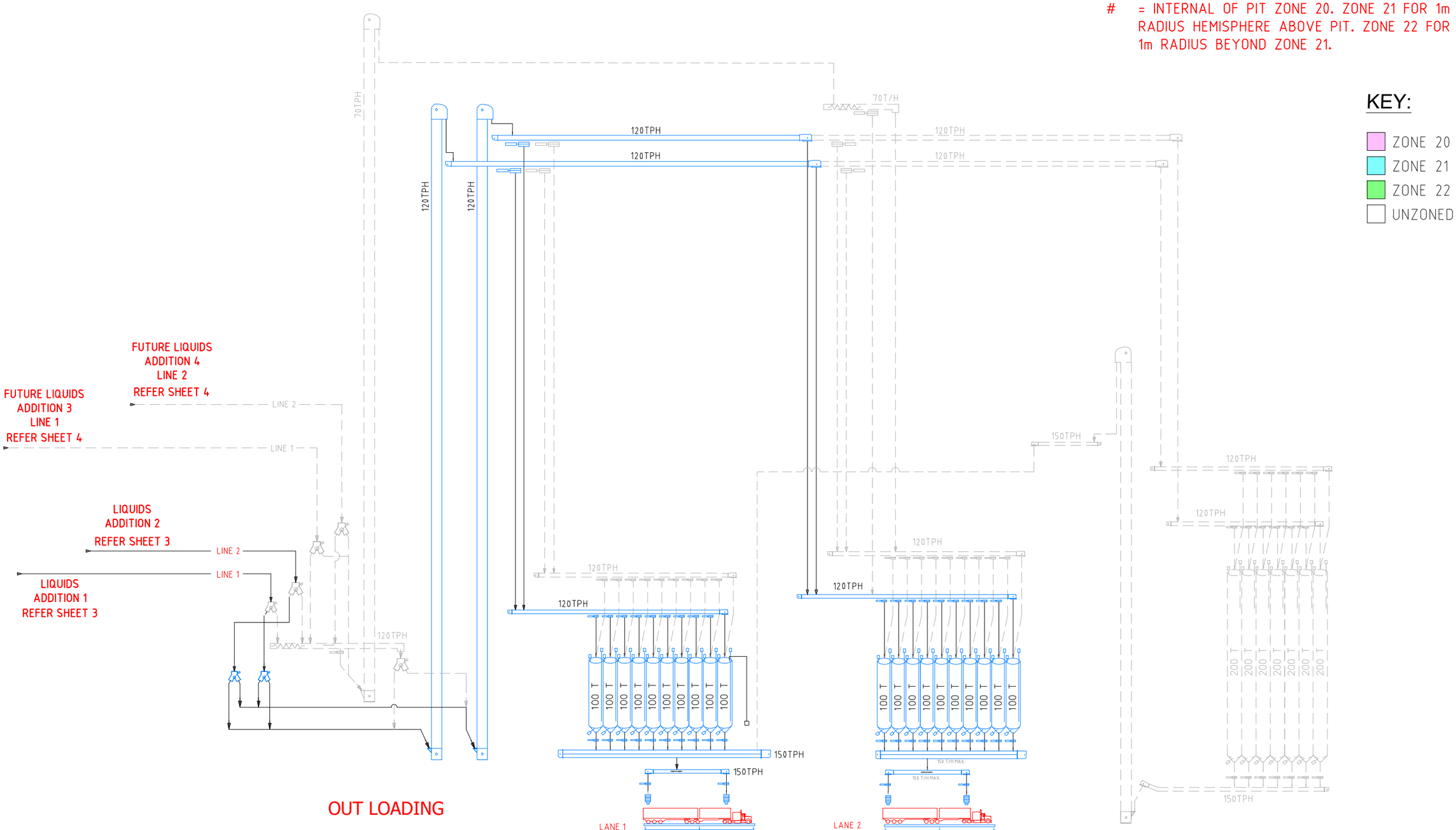
NOTE:

* = 0.5m HEMISPHERE ZONE 22 AROUND OUTLET

\# = INTERNAL OF PIT ZONE 20. ZONE 21 FOR 1m RADIUS HEMISPHERE ABOVE PIT. ZONE 22 FOR 1m RADIUS BEYOND ZONE 21.

KEY:

- ZONE 20
- ZONE 21
- ZONE 22
- UNZONED



LGPM SUPPLY

FUTURE

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ORIGINAL FLOW DIAGRAM = LPGM 9873-00001 SHT 1 REV 11

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Drawn	WMP	03.04.24
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Checked	PL	03.04.24

Client: Baiada Group, PO Box 21, Pendle Hill, NSW 2145 (Baiada)

Client Name: BAIADA

Client Approval:

EDCelectrical design&construction
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Title: BAIADA GROUP
TANGARATTA FEEDMILL
HA (DUST) ZONE CLASSIFICATION
FLOW DIAGRAM
SHEET 5 OF 5

Drawing Status: FOR CONSTRUCTION

Scale: NTS

Reference: 27083-E704

Sheet: A3

Client Drawing No.: E704

Rev.: 1

Do Not Scale - If In Doubt Ask.

STATEMENT OF ATTAINMENT

COMPETENCY TRAINING

A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more accredited units.

This is a statement that

PETER LADE

has attained

UEENEEM052A	Classify hazardous areas - gas atmospheres
UEENEEM053A	Classify hazardous areas - dust atmospheres
UEENEEM054A	Plan electrical installations for hazardous areas - gas atmospheres
UEENEEM055A	Plan electrical installations for hazardous areas - dust atmospheres
UEENEEM057A	Design explosion-protected electrical systems and installations - gas atmospheres
UEENEEM058A	Design explosion-protected electrical systems and installations - dust atmospheres

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ABN 32113051139

COMPETENCY TRAINING PTY LTD

Certificate number

CR17435

Dated

18/08/2014

Steven Lonton

Director

NATIONALLY RECOGNISED TRAINING

RTO No. 31299