Moss Vale Plastics Recycling and Reprocessing Facility

Technical Report 5 - Fire and Incident Management Review

Plasrefine Recycling Pty Ltd

1 November 2021

→ The Power of Commitment

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Executive summary

The proposal

Plasrefine Recycling Pty Ltd (Plasrefine Recycling) ('the proponent') is seeking approval to construct and operate a plastics recycling and reprocessing facility in Moss Vale, NSW ('the proposal').

The proposal involves constructing and operating a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics. The proposal also includes ancillary infrastructure to support the proposal.

The proposal would sort the plastics into different types, and convert the various plastics to flakes and pellets (in the first stage) and produce more advanced products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

The proposal is State significant development and is subject to approval by the NSW Minister for Planning and Public Spaces under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report

This Fire and Incident Management Review report has been prepared on behalf of Plasrefine Recycling for the proposal to support the environmental impact assessment (EIS) for the proposal and responds to the Secretary's Environmental Assessment Requirements (SEARs) for fire safety.

This report includes a description of the proposal, the proposed combustible waste stockpiles handled on the plastics recycling and reprocessing facility site, and an assessment of the proposal against the Fire and Rescue NSW (FRNSW 2020) Guideline *Fire Safety Guideline – Fire Safety in Waste Facilities* (the 'FRNSW Guidelines'). The report is specifically in relation to the combustible waste stockpiles at the plastics recycling and reprocessing facility.

Preliminary fire safety requirements were identified in response to the FRNSW Guideline assessment findings.

Preliminary fire safety requirements

The following preliminary fire safety requirements were identified in response to the assessment against the FRNSW Guidelines. The requirements are presented in two separate tables, one being for site wide requirements whilst the other being specifically for Building 1 (northern building)

Preliminary Fire Safety Requirements – Site Wide

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the BCA would be installed within the buildings. The detailed design and development of a BCA report would confirm these requirements.
Fire hydrant system	A fire hydrant system would be provided in accordance with BCA Clause E1.3 and would be designed to AS2419.1-2005. The following (summarised) FRNSW Guideline requirements would also apply (see Section 2.4 for details): – The fire hydrant system would be designed for at least 3 fire hydrants simultaneously flowing (30 L/s). – The fire hydrant system would provide the above simultaneous flow rate for at least 4 hours minimum duration. Hydrants would not be located within 10 m of any stockpiled storage.
Fire hose reels	Hose reels would be provided in accordance with BCA Clause E1.4.
Perimeter access	Perimeter road access of at least 6 m in width, capable of supporting specialist fire appliance use, would be provided around each building as required to satisfy the FRNSW Guidelines.

Fire safety measure	Description
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Refer Figure 2.9. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides. The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.
Fire water containment	An automatic fire water run-off containment system would be provided and designed to contain the total combined hydraulic demand of the fire hydrant and fire sprinkler system
Operational requirements (FRNSW Guidelines)	Prior to operations of the facility, Plasrefine Recycling would do as follows: – An operations plan would be documented and implemented for stockpile management and a copy would be included within the Emergency Services Information Package (ESIP). – An Incident Response Management Plan would be provided for staff and other persons at the facility in the event of fire. – An Emergency Services Information Package (ESIP) would be provided for firefighters in accordance with FRNSW guideline Emergency services information package and tactical fire plans. Further to the above, the fire safety systems for the plastics recycling and reprocessing facility would be inspected and maintained with corresponding fire safety statements being issued; The provision of maintenance would be covered in any leasehold contract. AS1851-2012 would be utilised.

Preliminary Fire Safety Requirements – Building 1

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the BCA would be installed within the buildings. The detailed design and development of a BCA report would confirm these requirements.
Fire sprinklers	An automatic fire sprinkler system would be required in accordance with BCA Clause E1.5 and Specification E1.5 for Building 1, and would be designed to AS2118.1-2017. The following (summarised) FRNSW Guideline requirements would also apply (see Section 2.4 for details): – The sprinkler system would be designed for High hazard classification. – Sprinkler water supply time would be at least 2 hours.
Fire detection	A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 would be required for Building 1.
Smoke hazard management	As per the FRNSW Guidelines, an automatic smoke exhaust system would be required for Building 1 and provide: – Exhaust rates are TBD depending on CFD modelling results, but would be demonstrated to maintain a smoke layer height above 4 m. The following requirements would apply to all smoke hazard management systems: – Initiation switches would be located at the FIP for any power-driven fans. – Signs and text alerting the Fire Brigade to the operation of the smoke exhaust system would be provided at the FIP in accordance with Clause 4.15 of AS1668.1. – The fans, fan cabling and the cabling of any doors required for make-up air would be fire rated so fans are capable of operating at 200 °C for 2 hours. – On activation of the fans make up air would be drawn via permanent openings or automatic opening doors at low levels. These openings would be on at least two or more separate walls.
Building occupant warning system	A building occupant warning system in accordance with BCA E2.2 and AS1670.1-2018 would be required for Building 1. Manual alarm points would be installed throughout Building 1, adjacent to each exit door.

Fire safety measure	Description
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Refer Figure 2.9. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides. The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.
Management In use	To prevent the unloading zone from being used as a permanent storage area; The operations plan would include reference that the unloading zone as shown in Figure 2.10 would not be used for long term storage. The purpose of the zone would be for facilitating the offloading of trucks and distribution into stockpile pens.

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1. Introduction

1.1 Overview

1.1.1 Plasrefine Recycling and the proposal

For many years, recyclable plastics have been recovered from kerbside collections and it has been profitable to export mixed plastics to China and other countries. With the advent of the China National Sword policy (a policy in China which banned the importation of certain types of waste and set strict contamination limits on recyclable materials), as well as issues with contaminated loads of recyclables being sent to China and other countries, opportunities to send mixed plastics overseas for processing have diminished. Recently, the Council of Australian Governments (COAG) decided to ban exports of recyclable waste from Australia from July 2021.

Despite these difficulties, export markets still exist for clean, separated, pelletised plastics and resins. However, there is very little local capacity in NSW and within Australia to sort recovered plastics into different types and convert them into valuable products.

To help address this issue, Plasrefine Recycling Pty Ltd (Plasrefine Recycling) ('the proponent') proposes to construct and operate a plastics recycling and reprocessing facility in Moss Vale ('the proposal').

The proposal would sort the plastics into different types, and convert the various plastics to plastic flakes and pellets (in the first stage) and produce more advanced plastic products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

The proposal would have an ultimate capacity to receive up to 120,000 tonnes per year of mixed waste plastics.

1.1.2 Approval and assessment requirements

The proposal is State significant development and is subject to approval by the NSW Minister for Planning and Public Spaces under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report has been prepared by GHD Pty Ltd (GHD) as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to support the application for approval of the proposal and address the environmental assessment requirements of the Secretary of the NSW Department of Planning, Industry and Environment (SSD-9409987) dated 15 October 2020 (the SEARs).

1.2 The proposal

1.2.1 Location

The proposal would be located about 140 kilometres south west of the Sydney central business district and approximately 2.8 kilometres north west of the Moss Vale town centre within the Wingecarribee local government area.

The proposed plastics recycling and reprocessing facility and ancillary infrastructure would be located on the northern parcel of land in Lot 11 DP 1084421, with a current street address of 74-76 Beaconsfield Road, Moss Vale. This parcel of land is referred to as 'the plastics recycling and reprocessing facility site' for the purpose of the EIS. It has a total site area of about 7.7 hectares. The proposal would occupy a portion of the plastics recycling and reprocessing facility site.

The new access road which would extend from the plastics recycling and reprocessing facility to Lackey Road via:

– the currently unformed Braddon Road
– Lot 1 DP 26490 and Lot 10 DP 1084421 (the 'Braddon Road east extension').

The area that would be occupied by the proposal's permanent operational infrastructure, and/or directly disturbed during construction, is referred to as 'the proposal site' for the purposes of the EIS. The proposal site therefore comprises:

– The plastics recycling and reprocessing facility site (7.7 hectares)
– The new access road corridor (about 1.8 hectares)

It is noted that the areas that would be disturbed for construction of buildings, roads and water management would comprise about six hectares of the total 7.7 hectare plastics recycling and reprocessing facility site. Disturbance of the remaining 1.7 hectares would be limited to plantings as part of riparian vegetation management and landscaping.

The location of the proposal is shown in Figure 1.1.

1.2.2 Key features

The proposal is defined as the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics, comprising:

– Two main buildings for waste receival, recycling and reprocessing and finished product storage
– Wastewater treatment plant
– Ancillary infrastructure including an office building, workshop, truck parking, staff and visitor parking, internal roadways, weighbridges, water management, fire management, landscaping, fencing, signage and utility connection
– A new access road from the plastics recycling and reprocessing facility to Lackey Road via part of Braddon Road (currently unformed) and Lot 1 DP 26490 and Lot 10 DP 1084421 (the Braddon Road east extension).

The proposal would sort the plastics into different types and convert the various plastics to flakes and pellets (in the first stage) and produce more advanced products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

Further information on the proposal is provided in the EIS.

The key features of the proposal are shown in Figure 1.2.

1.2.3 Construction overview

An indicative construction strategy has been developed, based on the current design, to be used as a basis for the environmental assessment process. Detailed construction planning, including programming, work methodologies and work sequencing would be undertaken once construction contractor(s) have been engaged and during detailed design.

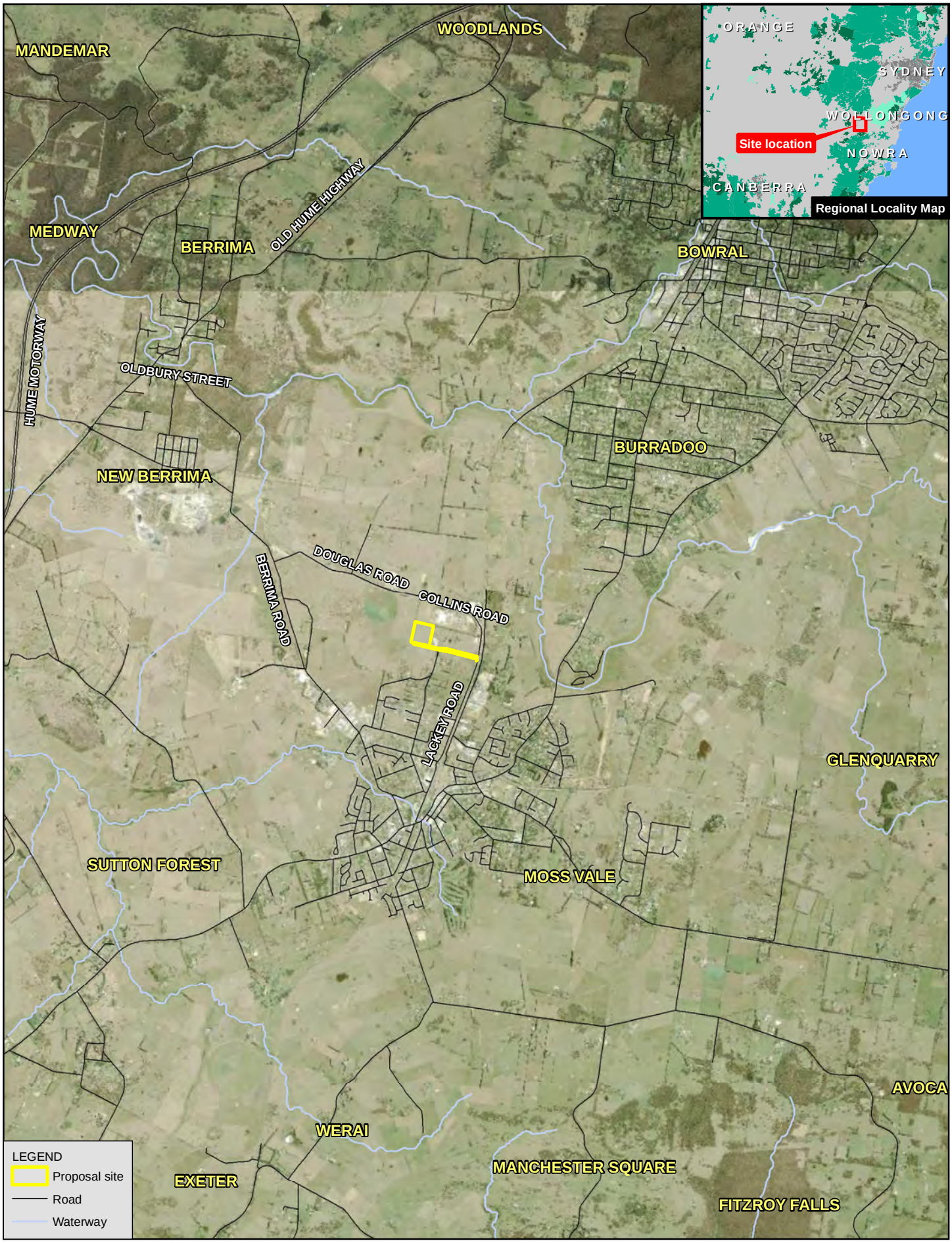
It is estimated that the proposal would take about 15 months to construct and commission and consist of three key stages:

– Early works and site establishment (1 month):
  - Construction of site access road
  - Utilities connection
  - Establishment of construction compound including construction staff amenities
  - Installation of temporary fencing
– Main site works (11 months):
  - Clearance of vegetation within the construction footprint, stripping and stockpiling of topsoil for reuse
  - Bulk earthworks for site shaping and surface water drainage and the bioretention pond
  - Pouring concrete foundation slab, footings, hardstand and slabs for the buildings
  - Construction of pavement areas for the truck and car park, internal roads and the site entrance/egress points
  - Installation of steel truss framework for structures
  - Erection of pre-cast concrete panels for external and internal partition walls and metal roof sheets for site buildings
  - Installation of processing equipment

- Building finishing works including fit out
- Installation of firewater and other tanks
- Installation of weighbridges
- Installation of permanent fencing and signage
- Restoration works including removal of temporary construction compound, general site clean up and landscaping following construction

– Testing and commissioning (3 months)

Further information on how the proposal would be constructed is provided in the EIS.



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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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GHD

Plasrefine Recycling Pty Ltd
Moss Vale Plastics Recycling and Reprocessing Facility

Project No. 12524108
Revision No. A
Date 22 Dec 2021

Proposal site location

FIGURE 1.1

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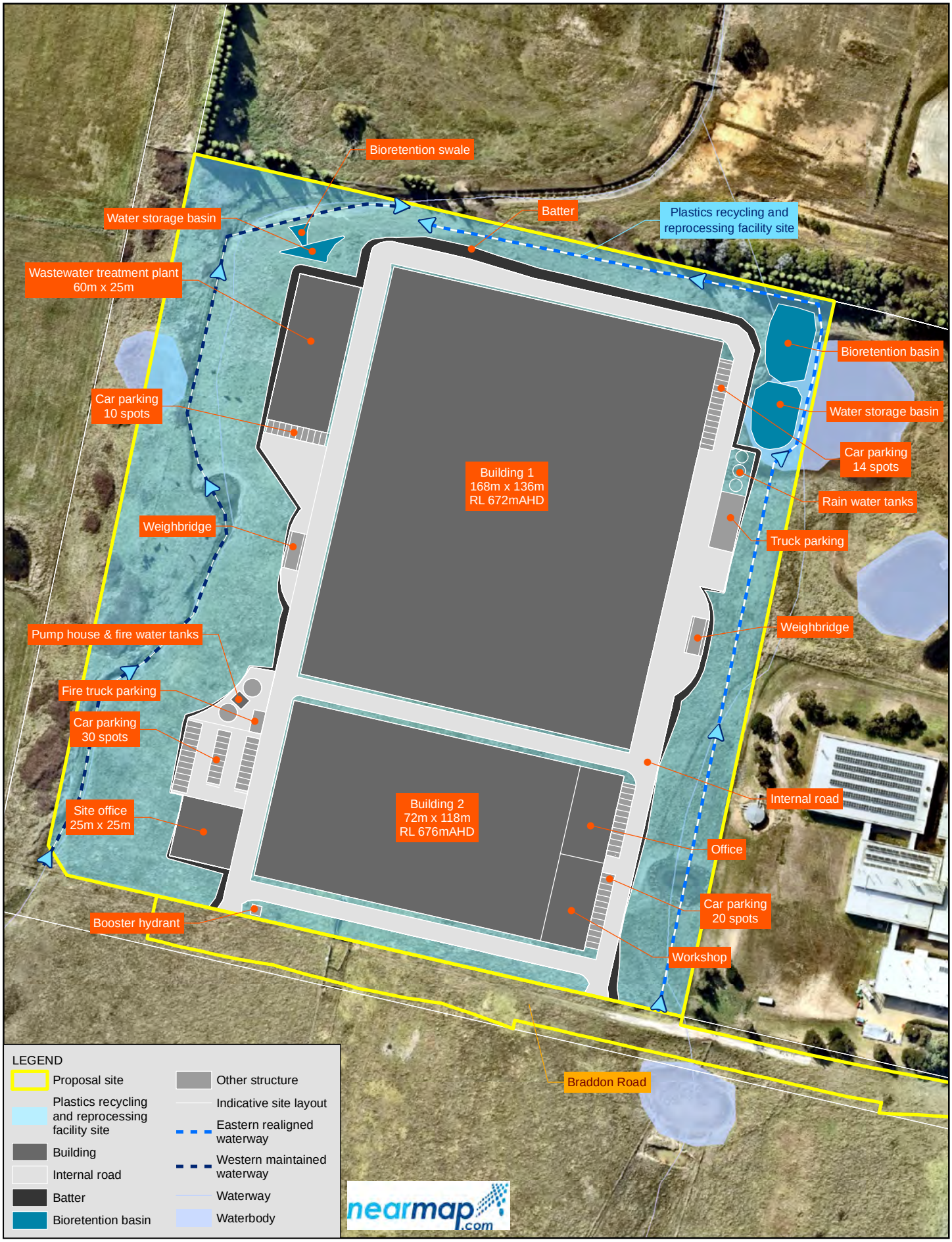

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
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GHD

Plasrefine Recycling Pty Ltd
Moss Vale Plastics Recycling and Reprocessing Facility

Project No. 12524108
Revision No. A
Date 06 Oct 2021

Proposed site layout

FIGURE 1.2

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Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021); General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

1.3 Secretary's Environmental Assessment Requirements

The SEARs relevant to this report are summarised in Table 1.1.

Table 1.1 SEARs relevant to this assessment

Requirement	Where addressed in this report
Identification of the aggregate quantities of combustible waste products to be stockpiled at any one time;	Section 2.2, Table 2.1
Technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including location of fire hydrants and water flow rates at the hydrant) management and containment measures	Hydrants are addressed in Section 2.4 Air, noise, spill containment are addressed separately by others.
Details regarding the fire hydrant system and its minimum water supply capabilities appropriate to the site's largest stockpile fire load	Hydrants are addressed in Section 2.4
Details of size and volume of stockpiles and their management and separation to minimise fire spread and facilitate emergency vehicle access	Stockpile information in Section 2.2 Stockpile separation in Section 2.4.20
Consideration of consistency with NSW Fire & Rescue Fire Safety Guideline – Fire Safety in Waste Facilities (February 2020)	Section 2.4
Detailed information relating to the proposed structures addressing relevant levels of compliance with Volume One of the National Construction Code (NCC).	By others

The SEARs also requires consultation with relevant authorities, including NSW Fire and Rescue, and the Policies, Guidelines and Plans referred to include the Fire and Rescue NSW *Fire Safety Guideline – Fire Safety in Waste Facilities* (Fire and Rescue NSW, 2020).

1.4 Purpose and scope of this report

The purpose of this report is to complete an assessment of the waste stockpiles associated with the proposal that may impact the life safety of occupants and fire brigade intervention. The report:

– Details the proposed stockpile sizes as part of the proposal
– Review for consistency with between the proposal with the Fire and Rescue NSW *Fire Safety Guideline – Fire Safety in Waste Facilities* (the 'FRNSW Guidelines') (Fire and Rescue NSW, 2020)
– Describes the preliminary fire safety requirements and services pertinent to the proposal.

The report is specifically in relation to the combustible waste stockpiles at the plastics recycling and reprocessing facility and its assessment against the FRNSW guidelines only.

1.5 Structure of this report

The structure of the report is outlined below.

– Chapter 1 – Provides an introduction to the report.
– Chapter 2 – Describes the method for the assessment of the proposal against the FRNSW Guidelines.
– Chapter 3 – Provides a summary of the preliminary fire safety requirements.
– Chapter 4 – Summarises the findings from the previous sections.
– Chapter 5 – Lists the sources used during the report.

2. Assessment method and FRNSW Guideline assessment

2.1 Assessment method

The FRNSW Guidelines is a document designed to '*provide guidance on fire safety in waste facilities that receive combustible waste material, including adequate provision for fire safety and facilitate safe fire brigade intervention to protect life, property and the environment*'.

The FRNSW Guidelines provide two development pathways for waste facilities, with respect to fire safety at the plastics recycling and reprocessing facility site. They can be to design as par an 'Acceptable Solution', or a 'Performance Solution'. The Performance Solution pathway would include referral to FRNSW for consultation. Please see below for the figure from the FRNSW Guidelines:

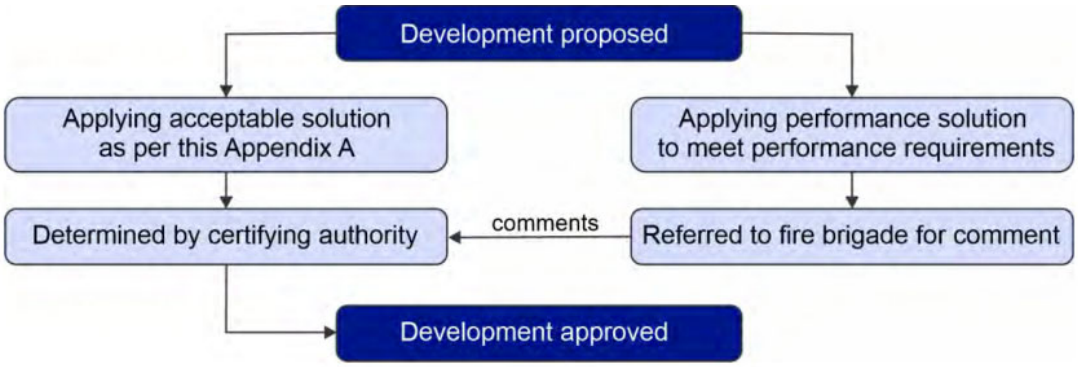

Figure 10 Pathways involving acceptable solution or performance solution

Figure 2.1 Excerpt from the FRNSW Guidelines

During the continued development of the proposal and prior to construction of facilities, engagement and consultation with FRNSW would be required to gain its feedback regarding the proposed design. This engagement and consultation would start with an initial meeting request to FRNSW, which is currently planned to occur following initial EIS submission.

2.2 Stockpile descriptions

The following information has been provided by the Plasrefine Recycling regarding the proposed operations and combustible waste stockpiles onsite.

Table 2.1 Stockpile information

Stockpile name	Materials	Location	Dimension (L x W x H)	Volume	Average density	Weight
Stockpile pen	Raw plastic (baled)	Along west part of the site	Each pen 10 m x 10 m x 4 m	400 m^3	~0.28t/m^3	112 t
Unloading Zone (Transitory zone)	Raw Plastic (unbaled)	West part of the site	40 m x 20 m	800 m^3	TBC	TBC

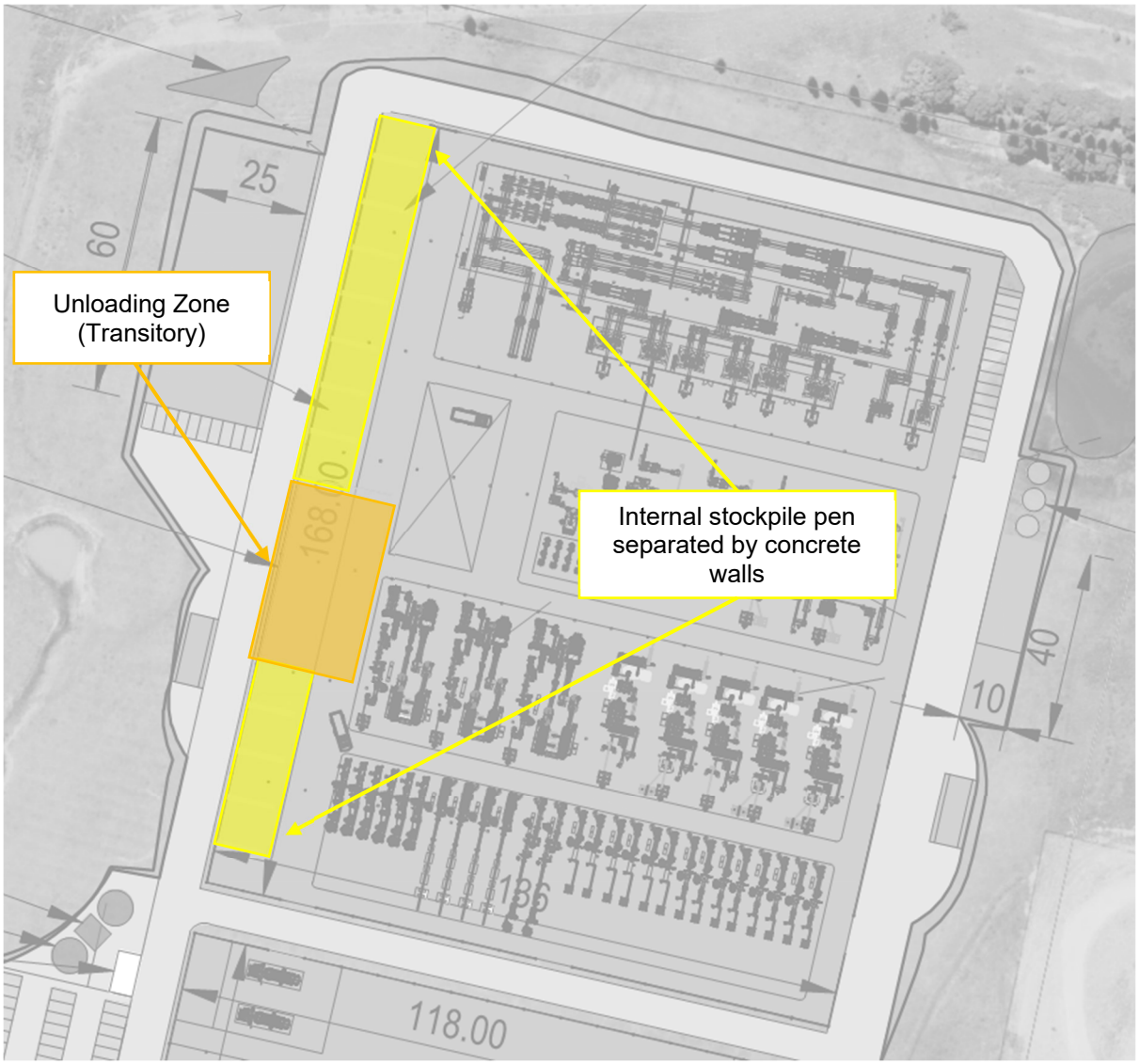

Figure 2.2 Markup of stockpile location (internal)

2.3 Buildings to be assessed

The proposed site would include two buildings and a range of ancillary infrastructure. For the purposes of this assessment, Building 1 (the northern building), as identified in Table 2.1, would have combustible waste stockpiles, and is assessed against the FRNSW Guidelines as part of this review.

The other building sites, including Building 2 (the southern building), are not proposed to contain combustible waste stockpiles. Therefore, while some of the site-wide FRNSW Guidelines would apply in general (such as access requirement using perimeter roads), Building 2 and the ancillary buildings are not the focus of this assessment. Building 2 (the southern building) and the ancillary buildings, would be still subject to BCA requirements, which would be developed by others, and are not detailed here.

2.4 Assessment against FRNSW Guidelines

2.4.1 'Specialist fire appliance' access

Requirement - 'Specialist fire appliance' access is provided to satisfy performance requirement CP9 of the NCC and FRNSW guideline Access for fire brigade vehicles and firefighters.

Specialist fire appliance access, as per the *FRNSW Fire Safety Guideline: Access for Fire Brigade Vehicles and Fire Fighters* (Fire and Rescue NSW, 2019), references aerial appliance use. The referral guideline for access in

this case dictates that carriageway widths throughout the proposal are to be at least six metres, sealed and capable of supporting aerial appliance weights. The proposal provides access to the buildings with a suitable perimeter access for fire appliance use, and indicative six metre wide pathways. Refer to Figure 2.3 for indicative access for fire brigade appliances.

As the proposal continues to develop, it is anticipated that the perimeter access and plastics recycling and reprocessing facility site access in general would continue to be adapted. Where any deviation in the perimeter access requirements is identified during the detailed development, these would be raised and discussed with FRNSW through the FEBQ process.

Traffic engineers would need to consider the length of the appliances in demonstrating the compliance of the roadways, in particular the swept paths of the aerial appliances, as internal roadway designs continue to be developed past the EIS stage.

Aerial fire brigade vehicles also have particular load requirements as they have stabilisers and high pressure points, which would need to be taken into account by designers as the accessways continue to be developed past the EIS stage.

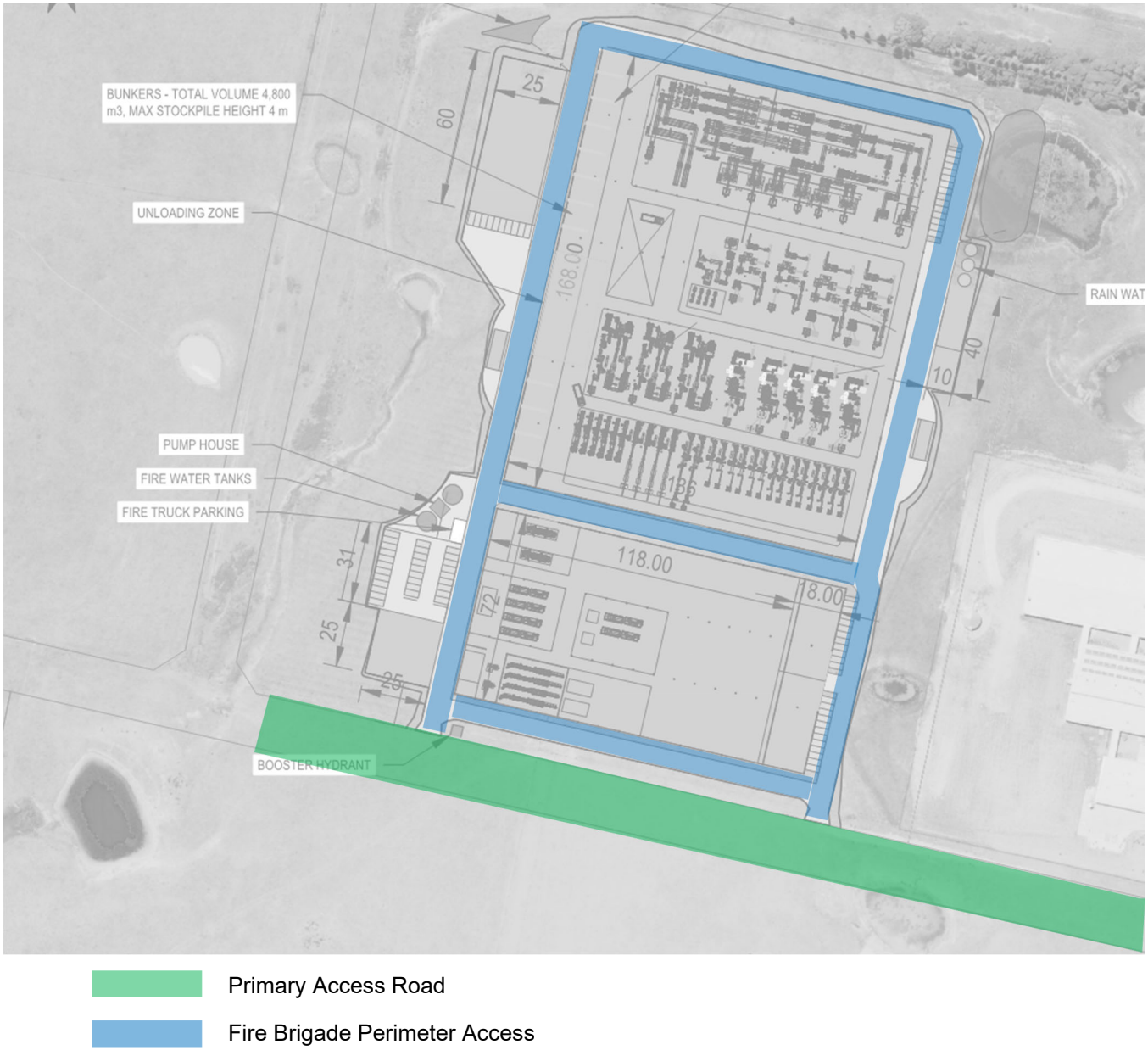

Figure 2.3 *Indicative mark-up of access for FRNSW vehicles*

2.4.2 Adequate firefighter access

Requirement - Adequate firefighter access is provided to the building, fire safety systems and equipment.

The high-level design strategy would be to provide perimeter doors to Building 1 and 2, such that multiple access and egress options are available. This perimeter door strategy would facilitate firefighter access from multiple potential vantage points. The hydrant network serving the building would be designed with perimeter door use in mind, with external hydrant design being preferable, so long as coverage can be met.

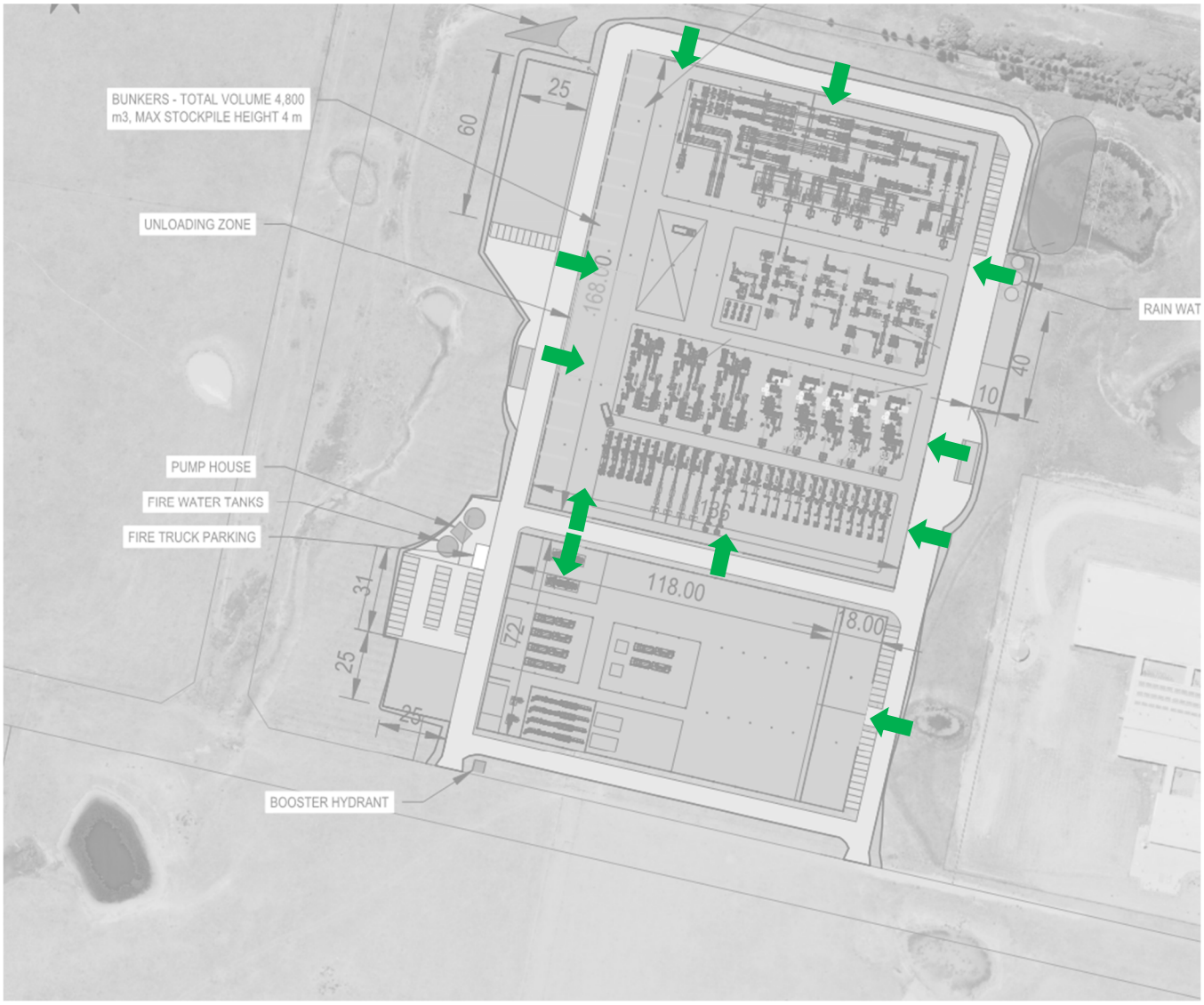

Figure 2.4 ***Indicative mark-up of access doors to buildings***

Where internal hydrants are necessary in order to achieve AS2419.1-2005 *Fire Hydrant Installations Part 1: System Design, Installation and Commissioning* (Standards Australia, 2005) coverage requirements, they would be provided. These would be developed as further detailed design progresses.

All other enclosed areas of the proposal, where no relevant stockpiles are present, would also be provided with adequate access to parts of the building for fire brigade, where determined by the *Building Code of Australia* (BCA) (Australian Building Codes Board, 2020) requirements for design. Actual location of doorways would be finalised as the design progresses.

2.4.3 Fire hydrant system design and coverage

Requirement - A fire hydrant system is installed to Australian Standard AS 2419.1 and provides coverage for both internal and external stockpiles.

Internal areas of Building 1 would be required to be provided with complying hydrant coverage as per AS2419.1-2005 and the BCA. Based upon preliminary layouts, it is anticipated that the hydrant system would utilise both internal and external hydrants placed in and around the building to provide coverage throughout the building based upon a complying two-hose length design.

While the internal layout would have direct impact as to coverage requirements and would be developed further to ensure compliance as the design progresses, Figure 2.5 shows a preliminary drawing which provides a proof of concept at this time for the stockpiles.

Design of internal layouts would be required to demonstrate hydrant locations prior to the issuance of a construction certificate. The design would be dependent on interior layouts, machinery placement and the like, therefore details of this design would be developed following the EIS stage.

Note that this is indicative, proof of concept at this stage only, and the hydrant locations would be modified as the design is developed following the EIS stage. However, the guidelines for coverage, as well as AS2419-2005 and BCA requirements, would be adhered to for Building 1, and other buildings on the plastics recycling and reprocessing facility site, as required by the BCA.

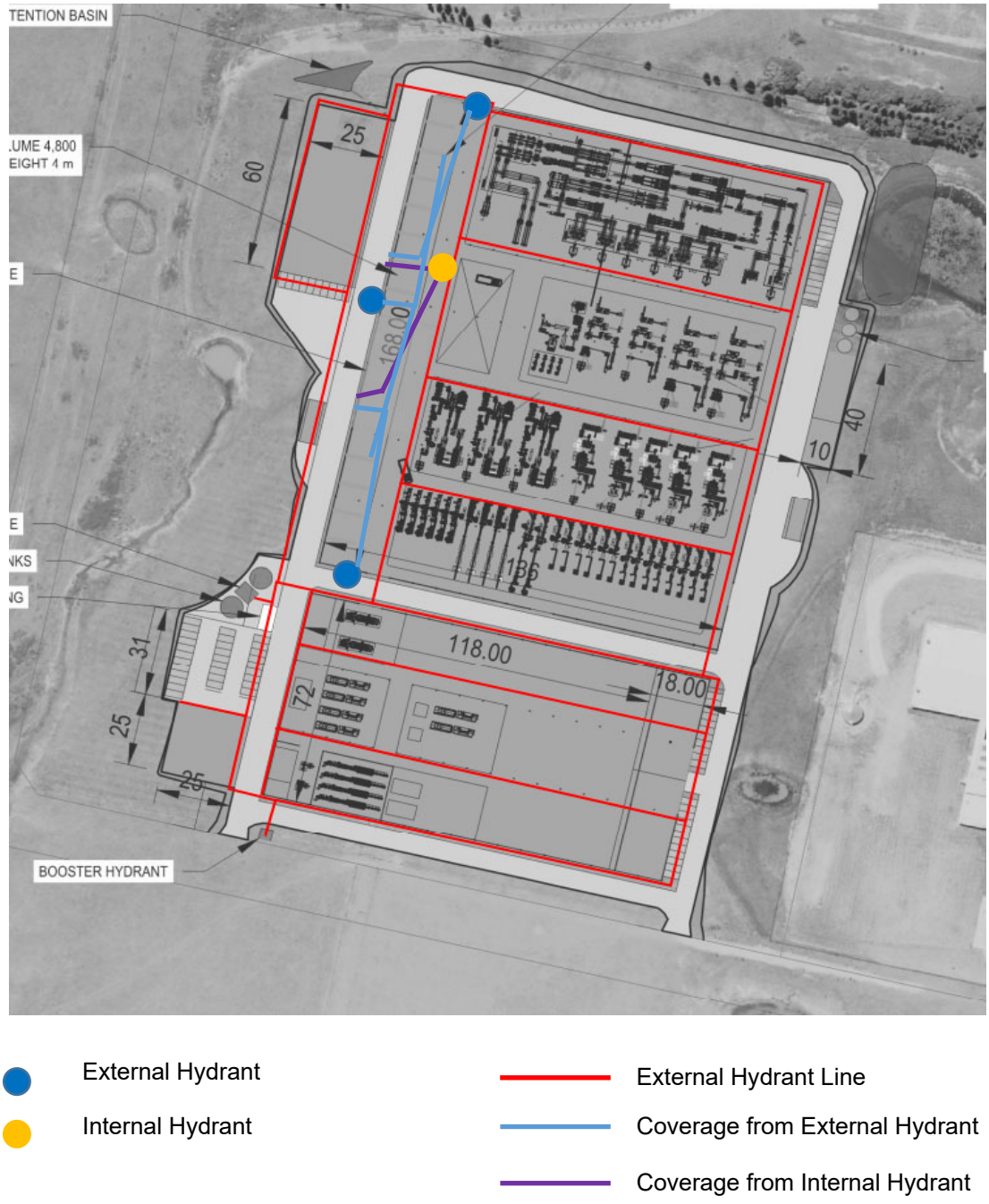

Figure 2.5 ***Indicative hydrant coverage to combustible waste stockpiles***

2.4.4 Fire Hydrant system enhanced performance

Requirement - The fire hydrant system incorporates enhanced standard of performance for external stockpiles (i.e. one additional hydrant to flow).

The requirement for an enhanced standard of performance of hydrants is required for combustible waste material not protected by a sprinkler system and external stockpiles. Stockpiles, including the transitory unloading zone, at the plastics recycling and reprocessing facility would be all situated internally as indicated in Figure 2.2.

As a requirement of the FRNSW Guidelines as well as the BCA, Building 1 would be sprinkler protected throughout in accordance with AS 2118.1-2017 *Automatic Fire Systems* (Standards Australia, 2017), and therefore, compliance with the FRNSW Guidelines would be achieved by the hydrant system by complying with AS2419.1-2005, with no further enhancement required.

2.4.5 Fire hydrants and stockpile locations

Requirement - Fire hydrants are not located within 10 m of any stockpiled storage (or vice versa), whether being internal or external.

The external hydrant layout would be designed to provide at least 10 metre separation from the waste stockpiles.

Internal hydrant locations would also be implemented, where necessary, in accordance with this 10 metre separation.

Figure 2.6 shows an indicative layout of the external hydrants around the plastics recycling and reprocessing facility site.

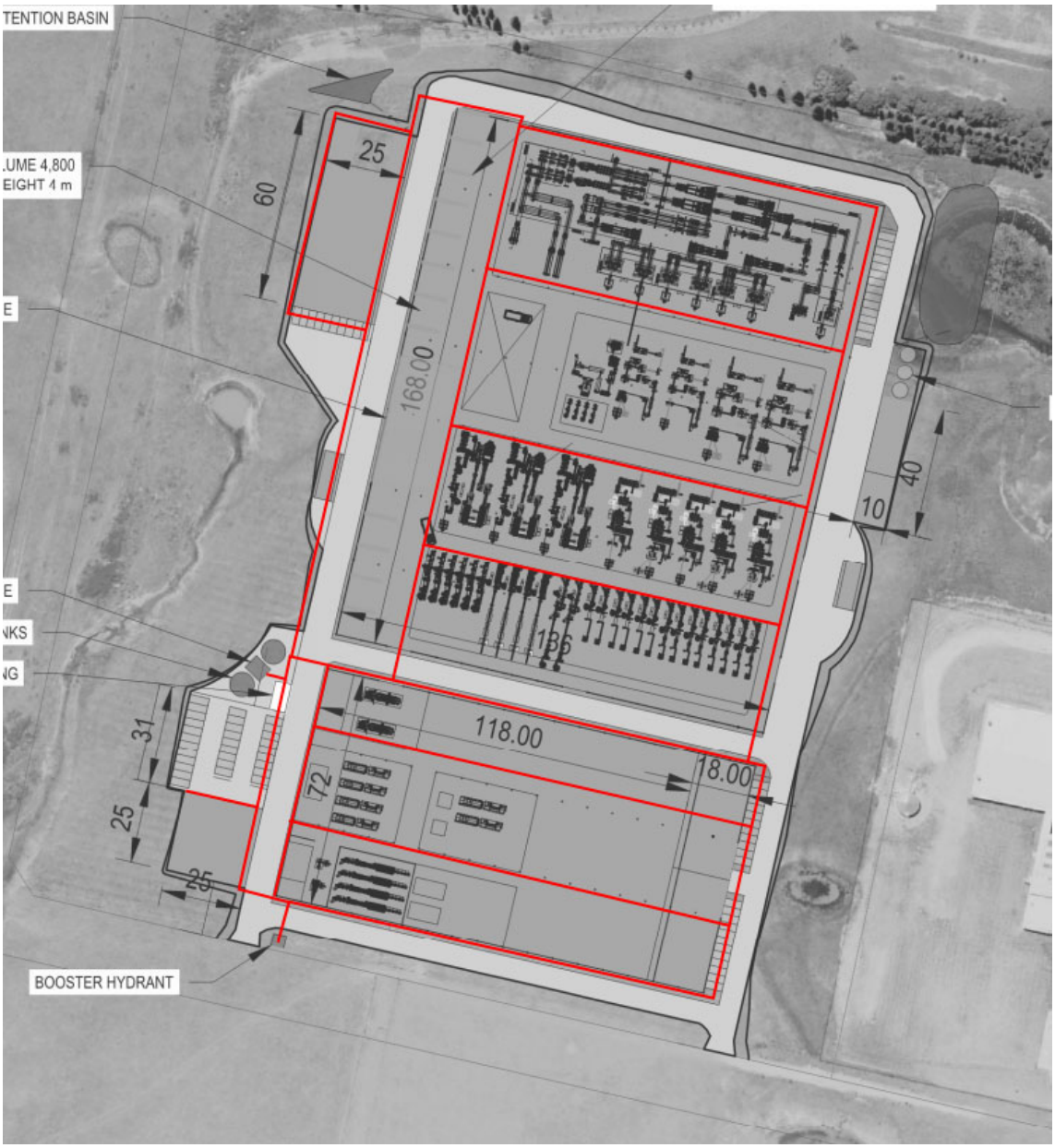

Figure 2.6 Indicative external hydrant layout

2.4.6 Fire hydrant system duration

Requirement - The fire hydrant system delivers the required number of fire hydrants to flow simultaneously for a minimum of four hours duration.

The fire hydrant system would be designed in accordance with AS 2419.1-2005 throughout the plastics recycling and reprocessing facility with no enhanced performance required as Building 1 would be sprinkler protected throughout in accordance with 2118.1-2017 (refer to Section 2.4.4).

Building 1, housing the processing equipment and stockpiles, would occupy a floor area of approximately 22,810 m^2. Therefore, according to AS 2419.1-2005, the proposal would be required to have three (3) hydrants running simultaneously (30 L/s), and therefore this flow rate is assumed at this stage.

The duration of simultaneous hydrant flow would achieve a four-hour duration, in accordance with both the FRNSW Guidelines and AS2419.1-2005.

2.4.7 Fire brigade booster location

Requirement - A fire brigade booster connection is installed within sight of the designated site entry point.

The fire brigade booster would be located adjacent to the designated site entry point as shown in Figure 2.7. This location would be evident as fire brigade pass through the site entry point.

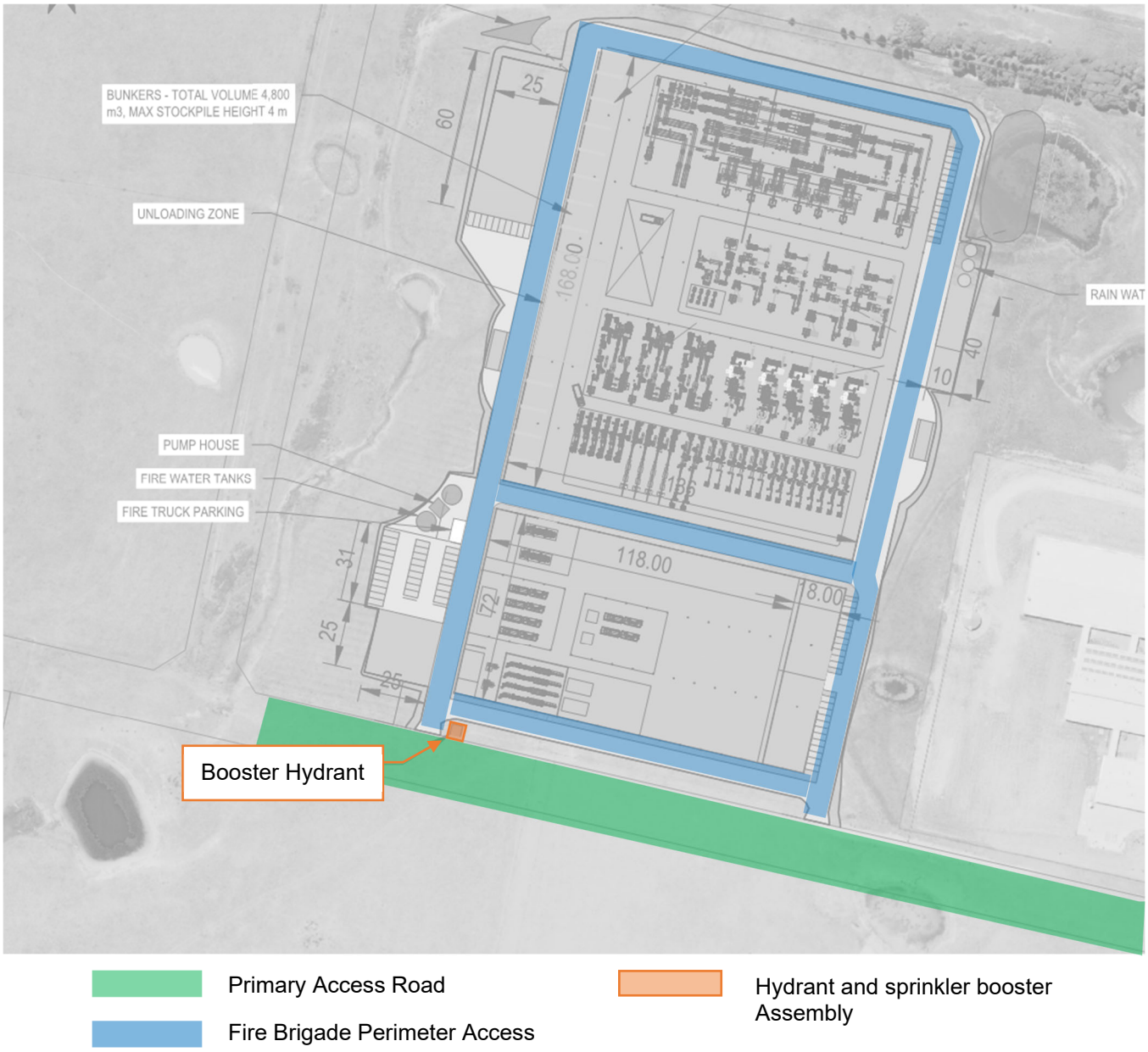

Figure 2.7 ***Hydrant and sprinkler booster location***

2.4.8 Fire hose reel system

Requirement - A fire hose reel system is installed to Australian Standard AS 2441 and provides coverage for both internal and external stockpiles.

Fire hose reels would be provided to buildings as required by BCA Clause E1.4 and in accordance with AS2441-2005 *Fire Hose Reel Installation* (Standards Australia, 2005).

2.4.9 Automatic fire sprinkler system design

Requirement - An automatic fire sprinkler system is installed to Australian Standard AS 2118.1 and designed for special hazard (e.g. 'high hazard' class).

The FRNSW Guidelines requires any building exceeding 1,000 m^2 and containing combustible waste material to be provided with a sprinkler system. Therefore, Building 1 would have a sprinkler system incorporated, including for high hazard as required by the FRNSW Guidelines.

The fire sprinkler system would be fed from the sprinkler pump house, connected to fire tanks (capacity TBC). The tanks would be refilled through infill connection from the town main. Large bore and small bore connections would be provided from the tanks.

Other buildings on the proposed site are not anticipated to incorporate waste stockpiles, therefore would be subject to BCA requirements as to whether or not they require automatic fire sprinklers. At this point, it is anticipated that Building 2 would require sprinklers, as a BCA requirement, however the detailed design and development of a BCA report would confirm these requirements.

2.4.10 Sprinkler booster connection

Requirement - A fire brigade booster connection is installed for the automatic fire sprinkler system and is co-located with the hydrant system booster.

The fire brigade booster connection would incorporate the automatic fire sprinkler system and be co-located adjacent to the hydrant system booster which resides within sight of the site entry point. Refer Figure 2.7.

2.4.11 Fire sprinkler duration

Requirement - The fire sprinkler system delivers not less than the total hydraulic demand for a minimum of two hours duration.

The sprinkler system for Building 1 would be designed for two hours duration, in accordance with the FRNSW Guidelines.

2.4.12 Fire detection and alarm system design

Requirement - A fire detection and alarm system is installed to Australian Standard AS 1670.1 and designed for the fire scenarios and environment (e.g. visual flame detectors, infrared detectors, heat detectors/probes).

A detection system in accordance with AS1670.1-2018 *Fire detection, warning, control and intercom systems - System design, installation and commissioning* (Standards Australia, 2018) would be provided to Building 1.

It is anticipated that thermal detection, or aspirating detectors, would be required in areas of Building 1, such as the stockpiling areas, to avoid false-alarming, as permitted by AS1670.1-2018.

Other buildings on the proposed site are not anticipated to incorporate waste stockpiles, therefore would be subject to BCA requirements as to whether or not they require fire detection and alarm systems. The detailed design and development of a BCA report would confirm these requirements.

2.4.13 Manual alarm points

Requirement - Manual alarm points are installed for staff to initiate alarm of fire.

Manual alarm points would be installed throughout Building 1. It is anticipated these would be located adjacent to exits from the building.

2.4.14 Smoke hazard management system design

Requirement - An automatic smoke hazard management system is installed and designed so the smoke layer does not descend below 4 m above floor level.

Building 1 would be provided with a smoke extraction system capable of maintaining the smoke layer 4 metres above floor level. Extraction rates and locations would be subject to detail design prior to construction to determine exact exhaust rate requirements.

Other buildings on the proposed site are not anticipated to incorporate waste stockpiles, therefore would be subject to BCA requirements as to whether or not they require smoke hazard management. The detailed design and development of a BCA report would outline these requirements.

2.4.15 Make-up air design

Requirement - Low level openings (e.g. roller doors) on two or more walls to assist with venting de-stratified smoke.

Building 1 would be provided with a number of access doors, or potentially louvres, to assist with venting de-stratified smoke. However due to the early design stage, the location of such doors/louvres have not been proposed. Indicative doors/louvres are however shown to achieve the intent, refer to Figure 2.8. The doors would automatically open upon fire detection within the building, with the number of doors to be determined during detailed design prior to issuance of a construction certificate.

The effectiveness of the proposed doors in providing make up air would be supported through the demonstration of suitability via Computational Fluid Dynamic modelling of such designs.

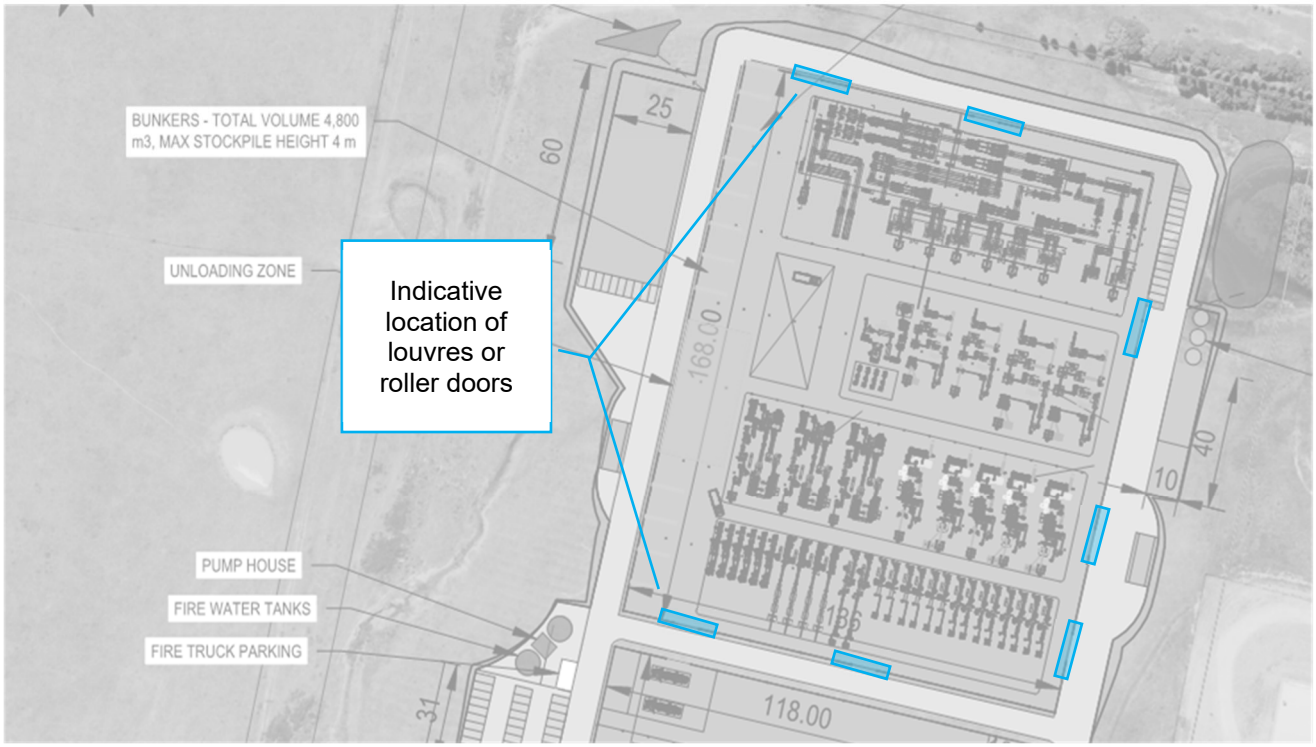

Figure 2.8 Indicative locations of louvres or roller doors available for venting smoke

2.4.16 Smoke hazard management operation time

Requirement - The automatic smoke hazard management system is capable of continuous operation for a minimum of two hours duration.

The smoke hazard management system for Building 1, including exhaust fans, drive, flexible connections, control gear and wiring, would be constructed and installed so that it would be capable of continuous operation at a temperature of 200°C for a period of not less than 2 hours, and comply with this requirement.

2.4.17 Automatic fire water run off containment system

Requirement - An automatic fire water run-off containment system is provided and designed to contain the total hydraulic demand of the fire hydrant and fire sprinkler systems.

The system design flow rates to accommodate fire systems have not been finalised at this stage. An onsite stormwater containment system would be provided to contain all fire water run off generated by systems including but not limited to the fire hydrant and fire sprinkler systems.

2.4.18 Pollution control equipment

Requirement - Pollution control equipment is provided to divert fire water run-off and isolate stormwater drainage in the event of fire.

Automatic closure of the stormwater system would be provided by an isolation valve. This would be connected to the Fire Detection control and Indicating Equipment (FDCIE) for the plastics recycling and reprocessing facility, such that in the event of smoke detection, sprinkler activation, or MCP activation, the isolation valve would close.

2.4.19 Bush fire protection

Requirement - The waste facility complies with NSW RFS Planning for Bush Fire Protection when located on bush fire prone land.

The proposal is not on bush fire prone land.

2.4.20 Stockpile separating walls

Requirement - Any separating masonry wall, revetment or pen is to extend at least 1 m above and at least 2 m beyond the stockpile.

All of the combustible waste stockpiles would be located to the western portion of Building 1. Each stockpile would be separated by a concrete wall with a height 1 m greater than the maximum stockpile dimension and extend for 2 m beyond the stockpiles width. This would be in accordance with Clause 8.2.6 of the FRNSW Guidelines as illustrated in Figure 2.9. The dimension of the stockpile bays would be 10 m x 10 m x 4 m. Therefore, the concrete separating walls between the stockpile bays would be 5 m tall and extend 12 m from the building's external wall.

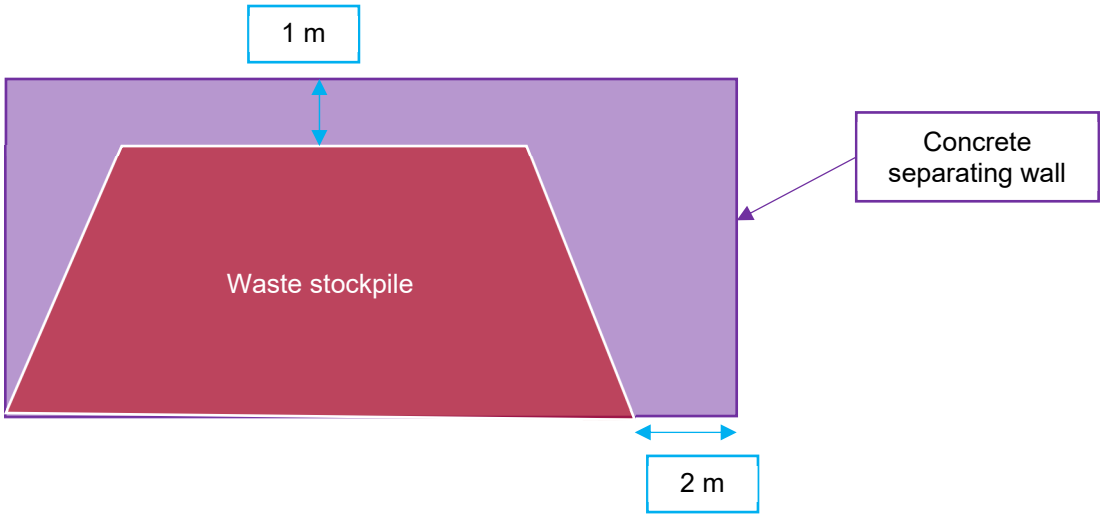

Figure 2.9 Side view of stockpile separating wall

Figure 2.10 shows a plan view of the separating walls and the expected dimensions.

The dimensions for the unloading zone would be approximately 40 m x 20 m. This unloading zone would be a transitory space and not for long term storage, therefore cumulative waste volume in this area would be low. This aspect is further discussed in Section 2.4.24.

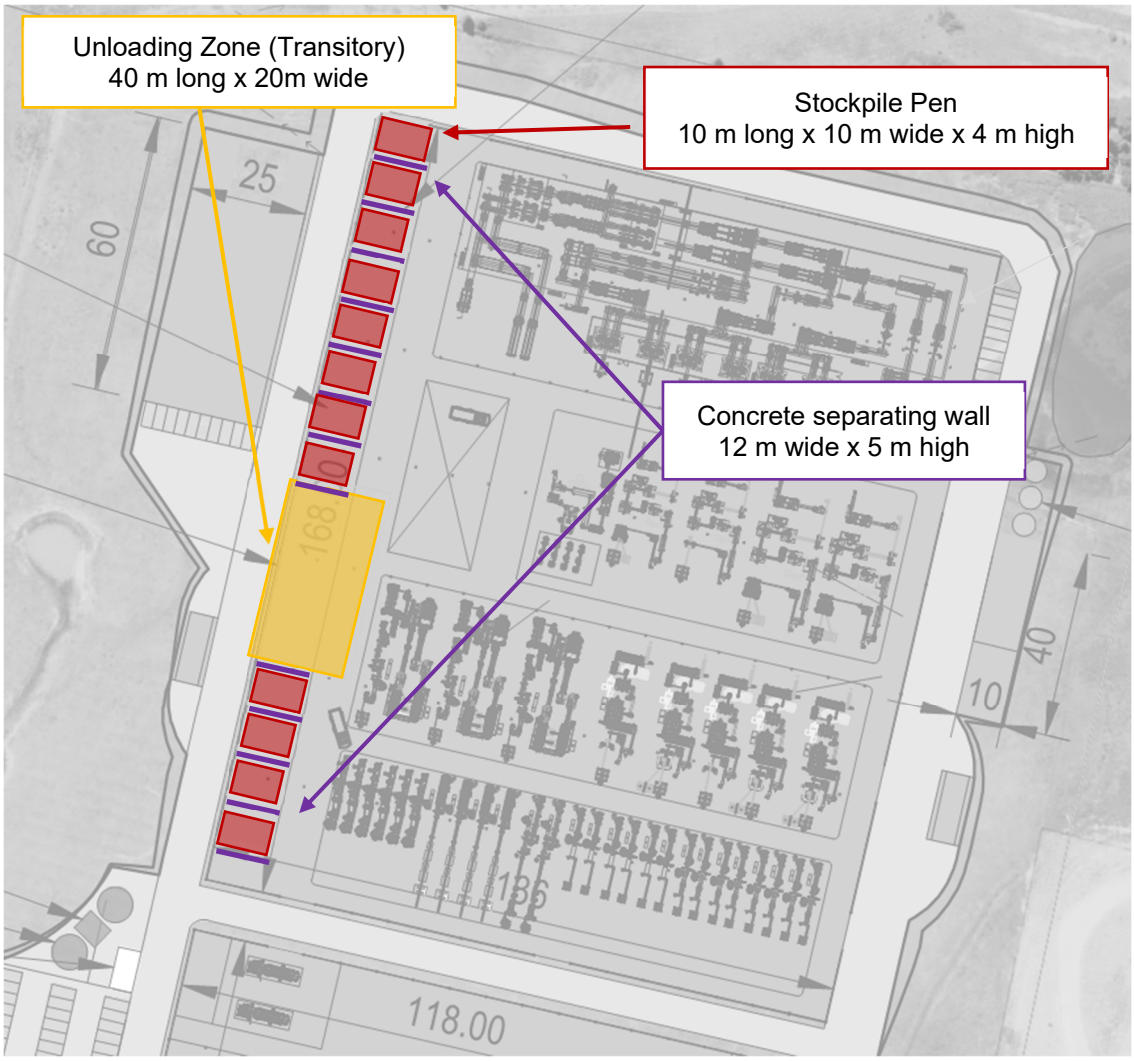

Figure 2.10 Location and dimension of concrete separating walls

In addition to the above, it is noted that at least a 6 m clear space would be provided in front of each stockpile.

The stockpile dimensions, separating walls and clearance requirements would be in accordance with the FRNSW Guidelines for internal stockpiles.

2.4.21 Self-heating stockpiles

Requirement - Any stockpile prone to self-heating is to be monitored and rotated as necessary to dissipate any hotspots.

Considering the type of waste is limited to plastics only, there are no self-heating stockpiles identified at the plastics recycling and reprocessing facility.

2.4.22 External stockpile design

Requirement - Any external stockpile is to be limited in size and maintain minimum separations to prevent fire spread, including reduced separation when protected by a masonry wall or an automatic fire sprinkler system.

All combustible waste stockpiles at the plastics recycling and reprocessing facility would be situated indoors as indicated in Figure 2.10. Therefore, there would be no external stockpiles proposed on-site.

2.4.23 External stockpile access

Requirement - Fire brigade vehicle access is provided between external stockpiles.

As discussed in Section 2.4.22, no other relevant stockpiles other than those stored inside Building 1.

2.4.24 Internal stockpile size limitation

Requirement - Each internal stockpile is to be limited in size to 1,000 m³.

As discussed in Section 2.4.20, internal stockpile sizes would comply with the stockpile size limitations.

With respect to the unloading zone, it is understood that this is a transitory zone whereby trucks unload into the area prior to being transferred into the respective stockpile pens as shown in Figure 2.10. The area is not utilised for long term storage and therefore would have a low volume of waste.

To ensure the zone is not used for prolonged storage, the following management in use requirement would be required:

– Operations plan would include reference that the unloading zone as shown in Figure 2.10 is not used for long term storage. The purpose of the zone would be for facilitating the offloading of trucks and distribution into stockpile pens.

2.4.25 Operations plan

Requirement - An operations plan is to be documented and implemented for stockpile management and a copy is be included within the Emergency Services Information Package (ESIP).

Plasrefine Recycling would document and implement an operations plan, incorporating the requirements of the FRNSW Guidelines, prior to commencement of operation of the facility. These operations plans would be incorporated into the Emergency Services Information Package (ESIP).

2.4.26 Emergency plan

Requirement - An emergency plan is to be provided for staff and other persons at the waste facility in the event of fire.

Plasrefine Recycling would document and implement an Incident Response Management Plan, incorporating the requirements of the FRNSW Guidelines, prior to commencement of operation of the facility. These emergency plans would be incorporated into the Emergency Services Information Package (ESIP).

2.4.27 Emergency services information package

Requirement - An Emergency Services Information Package (ESIP) is provided for firefighters in accordance with FRNSW guideline Emergency services information package and tactical fire plans.

Plasrefine Recycling would document and provide the ESIP, incorporating the requirements of the FRNSW Guidelines, prior to commencement of operation of the facility

2.4.28 Fire safety system inspection and maintenance

Requirement - Fire safety systems are to be inspected and maintained with corresponding fire safety statements being issued; The provision of maintenance should be covered in any leasehold contract.

Plasrefine Recycling would utilise AS1851-2012 *Routine Service of Fire Protection Systems and Equipment* (Standards Australia, 2012) as the base maintenance standard for the fire safety systems onsite, and a maintenance plan would be developed prior to the operation of the facility

3. Preliminary fire safety requirements

Table 3.1 provides a preliminary listing of fire safety requirements based upon the assessment of the FRNSW Guidelines in Section 2.4. It is noted that this listing would be continued to develop as the proposed site develops, and therefore is preliminary in nature only, and not intended to be an exhaustive list. Furthermore, the detailed design and development of a BCA report would outline the Deemed-to-Satisfy requirements, which are not included here except where also required by the FRNSW Guidelines.

Table 3.1 Preliminary fire safety requirements – site wide

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the BCA would be installed within the buildings. The detailed design and development of a BCA report would confirm these requirements.
Fire hydrant system	A fire hydrant system would be provided in accordance with BCA Clause E1.3 and would be designed to AS2419.1-2005. The following (summarised) FRNSW Guideline requirements would also apply (see Section 2.4 for details): – The fire hydrant system would be designed for at least 3 fire hydrants simultaneously flowing (30 L/s). – The fire hydrant system would provide the above simultaneous flow rate for at least 4 hours minimum duration. Hydrants would not be located within 10 m of any stockpiled storage.
Fire hose reels	Hose reels would be provided in accordance with BCA Clause E1.4.
Perimeter access	Perimeter road access of at least 6 m in width, capable of supporting specialist fire appliance use, would be provided around each building as required to satisfy the FRNSW Guidelines.
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Refer Figure 2.9. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides. The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.
Fire water containment	An automatic fire water run-off containment system would be provided and designed to contain the total combined hydraulic demand of the fire hydrant and fire sprinkler system
Operational Requirements (FRNSW Guidelines)	Prior to operations of the facility, Plasrefine Recycling would do the following: – An operations plan would be documented and implemented for stockpile management and a copy would be included within the Emergency Services Information Package (ESIP). – An Incident Response Management Plan would be provided for staff and other persons at the facility in the event of fire. – An Emergency Services Information Package (ESIP) would be provided for firefighters in accordance with FRNSW guideline Emergency services information package and tactical fire plans. Further to the above, the fire safety systems for the plastics recycling and reprocessing facility would be inspected and

Fire safety measure	Description
	maintained with corresponding fire safety statements being issued; The provision of maintenance would be covered in any leasehold contract. AS1851-2012 would be utilised.

Table 3.2 Preliminary fire safety requirements – Building 1

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the BCA would be installed within the buildings. The detailed design and development of a BCA report would confirm these requirements.
Fire sprinklers	An automatic fire sprinkler system would be required in accordance with BCA Clause E1.5 and Specification E1.5 for Building 1, and would be designed to AS2118.1-2017. The following (summarised) FRNSW Guideline requirements would also apply (see Section 2.4 for details): – The sprinkler system would be designed for High hazard classification. – Sprinkler water supply time would be at least 2 hours.
Fire detection	A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 would be required for Building 1.
Smoke hazard management	As per the FRNSW Guidelines, an automatic smoke exhaust system would be required for Building 1 and provide: – Exhaust rates are TBD depending on CFD modelling results, but would be demonstrated to maintain a smoke layer height above 4 m. The following requirements would apply to all smoke hazard management systems: – Initiation switches would be located at the FIP for any power-driven fans. – Signs and text alerting the Fire Brigade to the operation of the smoke exhaust system would be provided at the FIP in accordance with Clause 4.15 of AS1668.1. – The fans, fan cabling and the cabling of any doors required for make-up air would be fire rated so fans are capable of operating at 200 °C for 2 hours. – On activation of the fans make up air would be drawn via permanent openings or automatic opening doors at low levels. These openings would be on at least two or more separate walls.
Building occupant warning system	A building occupant warning system in accordance with BCA E2.2 and AS1670.1-2018 would be required for Building 1. Manual alarm points would be installed throughout Building 1, adjacent to each exit door.
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Refer Figure 2.9. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides. The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.

Fire safety measure	Description
Management in use	To prevent the unloading zone from being used as a permanent storage area; The operations plan would include reference that the unloading zone as shown in Figure 2.10 would not be used for long term storage. The purpose of the zone would be for facilitating the offloading of trucks and distribution into stockpile pens.

4. Evaluation and conclusions

This report involved the reviewing of the proposal against the FRNSW Guidelines.

The findings from the assessment indicate that the proposal would be capable of satisfying the requirements identified under the FRNSW Guidelines. Due to the proposal being in the very early design stages, there are aspects which are unknown and are required to be developed as the proposal design progresses.

Preliminary fire safety features applicable to the plastics recycling and reprocessing facility following the high level review have been documented.

The waste stockpile dimensions and volume are noted to be within the maximum permitted for internal stockpiles.

5. FRNSW Consultation

Revision 0 of this Fire and Incident Management Review has been submitted to FRNSW for consultation, and a preliminary meeting was held on 29 October 2021 regarding the application of the guidelines.

There were no objections from FRNSW on the overall plans of the site, however ongoing consultation is expected as the project is developed. Refer to Appendix A for a summary of the key points discussed during the meeting.

FRNSW will also be engaged as part of the detailed design, through the Fire Engineering Brief Questionnaire and Fire Engineering Report submissions, both of which shall also encapsulate the assessment of the FRNSW Guidelines.

6. References

Australian Building Codes Board. (2020). *Building Codes of Australia 2019 Amdt1 ed.* (2018 ed.). Canberra: Australian Building Codes Board.

Fire and Rescue NSW. (2019). *Fire safety guideline - Access for fire brigade vehicles and firefighters.* NSW: Fire and Rescue NSW.

Fire and Rescue NSW. (2020). *Fire safety guideline - Fire safety in waste facilities.* NSW: Fire and Rescue NSW.

Standards Australia. (2005). *AS2441-2005 Fire Hose Reels Installation.* Standards Australia.

Standards Australia. (2012). *AS1851-2012 Routine Service of Fire Protection Systems and Equipment.* Standards Australia.

Standards Australia. (2017). *AS2118.1-2017 Automatic Fire Systems.* Australia: Standards Australia.

Standards Australia. (2018). *AS1670.1-2018 Fire detection, warning, control and intercom systems - System design, installation and commissioning.* Standards Australia.

Appendices

Appendix A

Summary of meeting with FRNSW

Date of meeting: 29 October 2021

Location: Teleconference (Microsoft Teams)

Attendance:

FRNSW – Lachlan Haar, John Hawes

GHD – David Gamble, Colin Thomson, Karan Dhir, Mark Tsai

The key points discussed during the meeting are as follows:

- Discussed the design of the facility and its compliance with FRNSW Guidelines;
- No major non-conformances with guidelines proposed at this time;
- The unloading zone is a transitory area only and not for stockpiling;
- Management procedures to be developed ensuring no plastic waste is left in the unloading zone before leaving site, they shall be moved to respective stockpile pens;
- Stockpile pens are below the 1000 m^3 guideline limit and separated with non-combustible walls;
- Compliant hard-stand to be provided on premise (not on public road);
- Where the facility is not a 24/7 operation, potential for performance solution to address the operating sequence of perimeter doors for makeup-air (detailed design stage)
- Any critical design changes down the track will be flagged and discussed with FRNSW

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