



Bioelektra Australia Pty Ltd

West Nowra Resource Recovery Park Stage 2 Fire and Incident Management Review

May 2021

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1. Introduction

1.1 Background

Bioelektra Australia Pty Ltd (Bioelektra) proposes to construct and operate an integrated resource recovery facility at West Nowra (referred to in this report as 'the project').

This report has been prepared by GHD to provide an assessment of the Fire and Incident Management considerations associated with the project as an input to the environmental impact statement (EIS). Bioelektra is the proponent of the project and the EIS is being prepared by GHD in accordance with the requirements of Part 4 of the NSW Environmental Planning and Assessment Act 1979 (the EP&A Act).

The report addresses the requirements of the Secretary of the NSW Department of Planning, Industry and Environment (the Secretary's Environmental Assessment Requirements (SSD 9887)) dated February 2021. The SEARs are presented in Section 1.4.

1.2 Project overview

1.2.1 Staged project approval

In 2016 Shoalhaven City Council (Council) sought approval for a Concept Proposal for a resource recovery park with a combined capacity of 130,000 tonnes per year (the West Nowra Resource Recovery Park).

The Concept Proposal included:

- Stage 1 – clearing of land and provision of basic infrastructure on the nominated site, which would be undertaken by Council or contractors appointed by Council as part of early construction works.
- Stage 2 – construction and operation of a resource recovery park which would be undertaken by an alternative waste technology provider/ facility operator, selected through a tendering process to provide the specialised resource recovery facilities.

Council sought Project Approval for stage 1 as part of the same application.

A staged approach was adopted to enable construction of Stage 1 of the project to commence (subject to planning approval) while a contractor was appointed and details of Stage 2 were determined via the tendering and design process.

Council received Concept Approval and Stage 1 Project Approval for the West Nowra Resource Recovery Park on 25 August 2016 (SSD 7015). The approved Stage 1 works included:

- Demolition of the existing animal shelter
- Site preparation and clearing of the site
- Construction of perimeter, entry/exit and service roads and line marking
- Installation of perimeter/boundary fencing
- Weighbridge and weighbridge office
- Staff and visitor car parking, including line marking
- Detention and sedimentation dams/basins
- Identification of asset protection zones.

Council subsequently awarded Bioelektra with the contract to construct and operate Stage 2 of the works.

1.2.2 Project description

The project would comprise a range of waste and resource processing activities aimed at maximising resource recovery and minimising the amount of waste destined for landfill disposal.

The project is defined as the construction and operation of a resource recovery facility with pre-treatment for mixed municipal waste of up to 130,000 tonnes per year, comprising:

- Shredder operations
- Sterilisation of waste through autoclaving
- Sorting and processing operations
- Other areas for processing and storing and receiving processed material
- Transformer area
- Boiler room
- Wastewater treatment plant
- Offices and amenities (2 levels).

The project also includes ancillary infrastructure including:

- Weighbridges and weighbridge offices
- Covered holding bays
- Circulation roadways and road reserves
- Staff and visitor car parking, including line marking
- Two new sediment/detention basins
- Substation
- Liquid Petroleum Gas (LPG) station
- Fencing around the perimeter of the site
- Asset protection zones (APZs)
- Pump house and firefighting tanks.

The Concept Approval included construction and demolition (C&D) waste processing and an alternative waste treatment (AWT)/materials recovery facility (MRF).

C&D processing is no longer proposed part of the project and the waste processing technology proposed by Bioelektra includes sterilisation of waste through autoclaving and materials recovery through various sorting operations.

Other ancillary infrastructure not included as part of the Concept Approval but proposed for this project include the transfer station, covered holding bays, boiler room, substation, transformer hall, LPG station and pumping station and firefighting tank.

Construction activities relating to this project would include:

- Bulk earthworks for shaping of the site including access roads, parking area and construction hardstand
- Construction of surface water detention ponds, surface water drains and utilities connections

- Construction of concrete floor slab for the building
- Construction of structures and connection to utilities
- Pavement construction for access roads and parking area
- Fit out and installation of processing equipment and office furnishings.

1.2.3 Location of the project

The project site is approximately five kilometres to the west of the Nowra Central Business District and is accessed from Flatrock Road, off Yalwal Road in West Nowra. The site is adjacent to the existing landfill and is located on an approximate 3.6 ha parcel of land (Lot 342 DP 257515).

The subject site is zoned SP2 Infrastructure under the Shoalhaven Local Environmental Plan 2014 and allows for infrastructure and related uses. Under this zoning the site is assumed to be industrial. The regional map is shown in Figure 1.1 and the facility layout is shown in Figure 1.2.

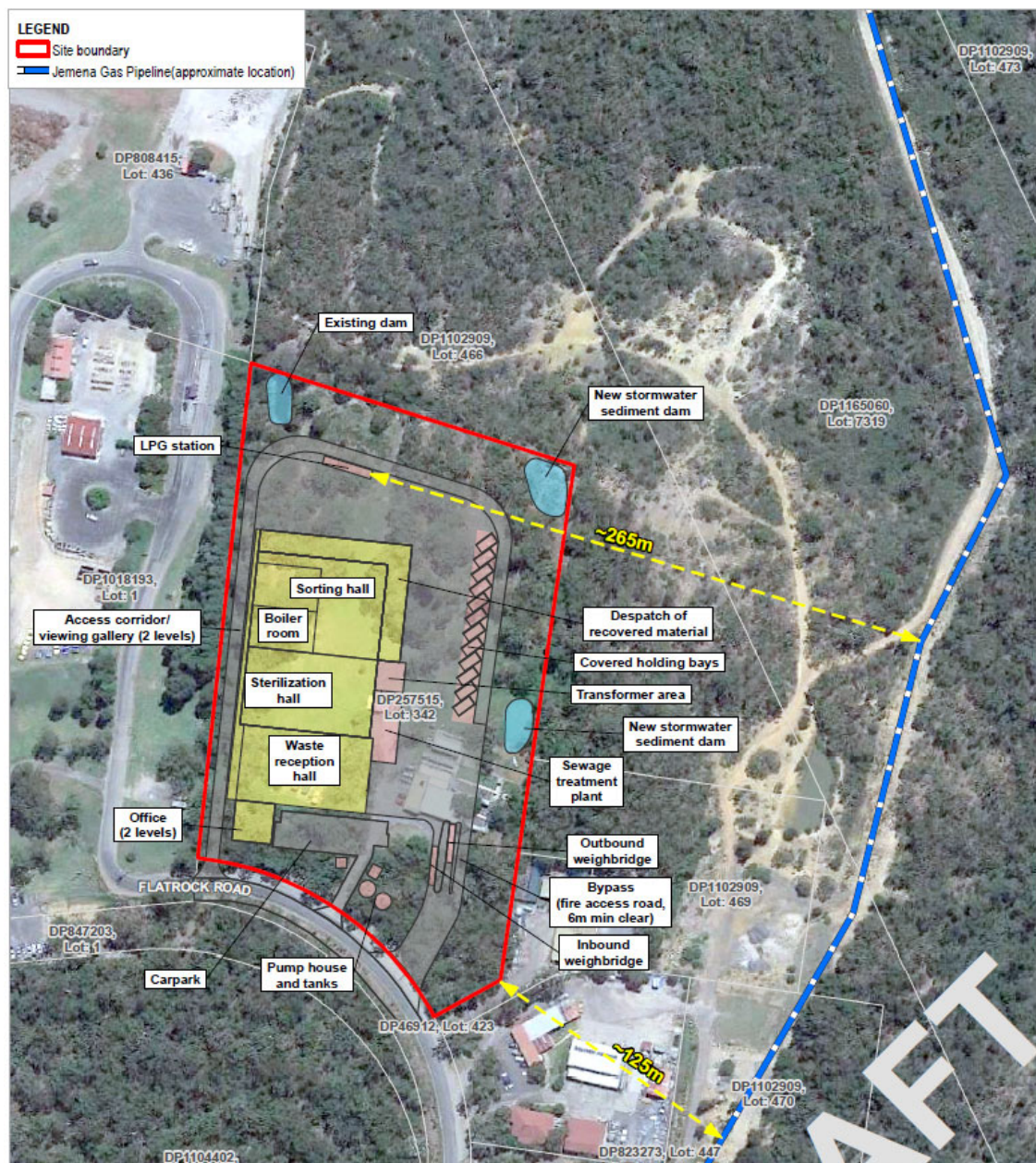


Figure 1.1 Regional map

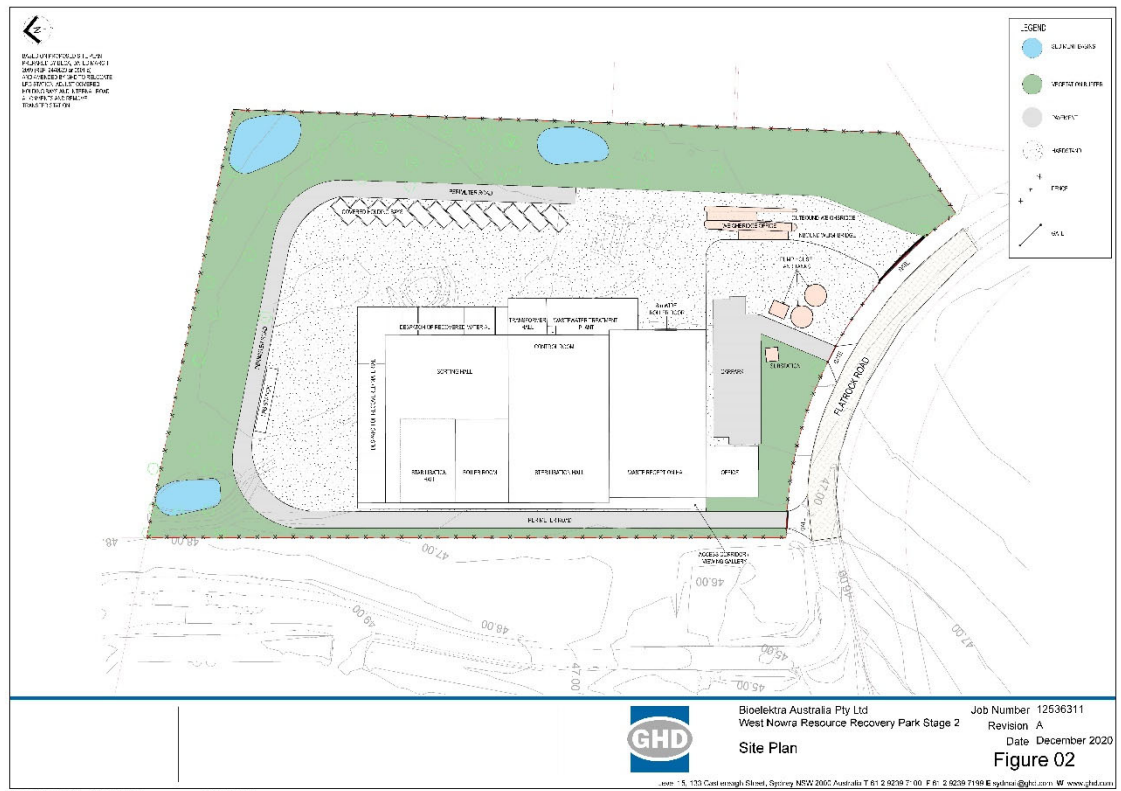


Figure 1.2 Site plan

1.3 Definitions

The following terms are used within this report:

- FRNSW – Fire and Rescue New South Wales
- FRNSW Guidelines - NSW Fire & Rescue Fire Safety Guideline – Fire Safety in Waste Facilities
- BCA – Building Code of Australia
- NCC – National Construction Code
- AS – Australian Standard

1.4 Secretary Environmental Assessment Requirements and agency requirements

The specific SEARs and agency requirements addressed in this report are summarised in Table 1.1.

Table 1.1 Secretary’s Environmental Assessment Requirements and agency requirements (extract)

Assessment requirements	Where addressed in 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 2.4.3 onwards and drawings attached in Appendix A. Air, noise, spill containment are addressed separately by others.
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 NSW Fire and Rescue Fire Safety in Waste Facilities Guideline

NSW Fire and Rescue have given prior feedback (26 February 2019), which indicate that Clauses E1.10/E2.3 apply, which are considered special hazard clauses. The NSW Fire and Rescue Fire Safety in Waste Facilities Guideline detail expectations when it comes to E1.10/E2.3 as they apply to waste management facilities. This is addressed in Section 2.4

1.5 Scope and structure of the report

1.5.1 Scope of report

This report provides an assessment of the proposed operations and design of the integrated resource recovery facility against the SEARs and FRNSW Fire Safety Guidelines for Waste Facilities.

The scope of the report includes:

- Detail on the proposed stockpile sizes on site (Section 2.2).

- Description of the preliminary fire safety requirements and services pertinent to the site (Section 2.3)
- Review for consistency with the FRNSW Fire Safety Guideline – Fire Safety in Waste Facilities (Section 2.4).

1.5.2 Structure of report

This report is structured as follows:

- Chapter 1 – Introduction – this chapter introduces the project and describes the site
- Chapter 2 – Existing environment – this chapter describes the existing environmental characteristics of the site relevant to the assessment
- Chapter 3 – SEARs Review and NSW Fire & Rescue Fire Safety Guideline Assessment

2. SEARS Review and FRNSW Guideline Assessment

2.1 Assessment methodology

The FRNSW *Fire Safety in Waste Facilities Guidelines* ('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 site. They can be to design as per an 'Acceptable Solution', or a 'Performance Solution'. The Performance Solution pathway will include referral to FRNSW for consultation. Please see below for the figure from the FRNSW Guidelines:

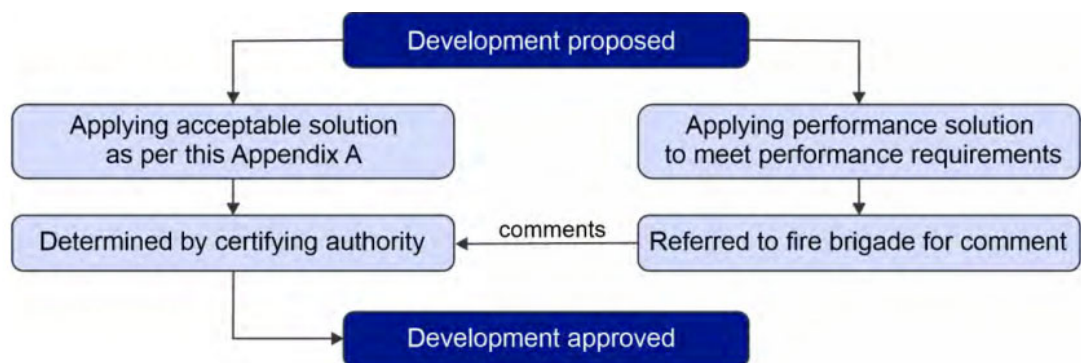


Figure 10 Pathways involving acceptable solution or performance solution

Figure 2.1 Excerpt from FRNSW Fire Safety in Waste Facilities Guidelines

During the continued development of the Development Site and prior to construction of facilities, engagement and consultation with FRNSW will be required to gain its feedback regarding the proposed design. This engagement and consultation will 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 client regarding the proposed operations and stockpiles onsite, broken down in Table 2.1 and marked up in Figure 2.2 and Figure 2.3.

Table 2.1 Stockpile information

Stockpile name	Materials	Stockpile location	Stockpile dimensions (L/W/H)	Weight
Mixed waste stockpile	Mixed waste	Internal, Waste reception hall	Height of 2.6 m ~ 750 m ³	610 tonnes
Mixed waste stockpile	Mixed waste	Internal, Waste reception hall	Height of 2.6 m ~1,000 m ³	790 tonnes
Non-conforming waste stockpile	Non-conforming waste	Internal, Waste reception hall	Height of 2.6 m ~250 m ³	200 tonnes
Sorted Stockpile	Biomass	Internal, Northern end of sorting hall	45.0 m x 10.3 m x 3.0 m ~1,390 m ³	397 tonnes
	PP/PE			9 tonnes
	PET			9 tonnes
	Metals (Fe)		<i>Note: Each waste material is stored in separate hooklift bins, making up the sorted 'stockpile'</i>	28 tonnes
	Fraction < 3			Included in Aggregates tonnage
	Metals (Non Fe)			3 tonnes
	Aggregates			102 tonnes
Sorted Stockpile	RDF light	Internal, Western end of sorting hall	40.5 m x 10.2 m x 3.0 m ~1,294 m ³	96 tonnes
	RDF heavy			78 tonnes
	Glass		<i>Note: With the exception of residual waste, each waste material is stored in separate hooklift bins, making up the sorted 'stockpile' Glass are stored in bags.</i>	34 tonnes
	Residual waste			100 tonnes
	Fraction 3-40			Included in Aggregates tonnage
Holding bay stockpile	Biomass, Landfill and RDF	External, North of the sorting hall at covered holding bays	87.5 m x 11.0 m x 3.0 m ~2,888 m ³ <i>Note: Biomass is stored in hooklift compactor bins</i>	Landfill: 100 tonnes Biomass & RDF: TBC

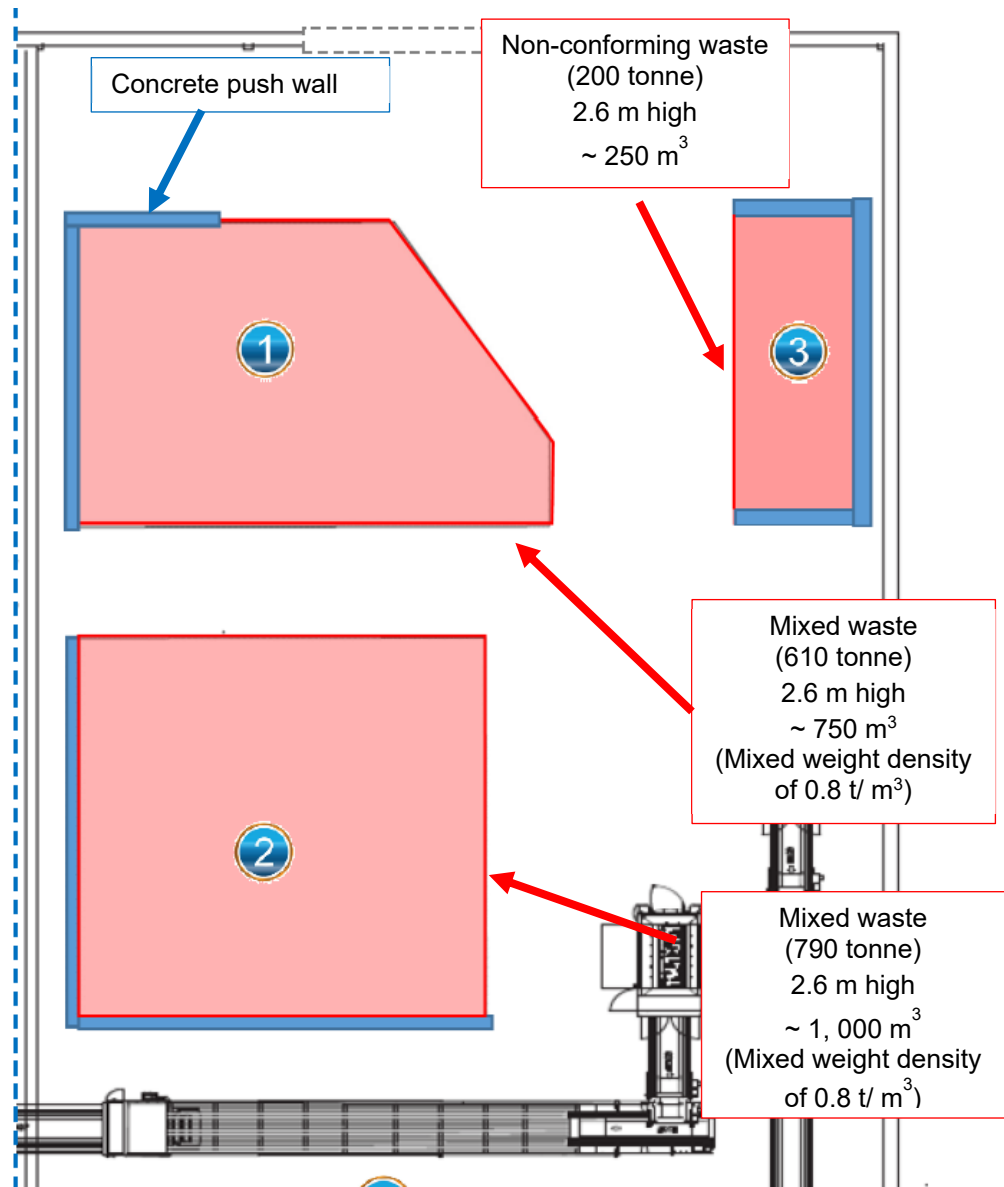


Figure 2.2 Mark-up of stockpile areas (Internal) - Reception Hall

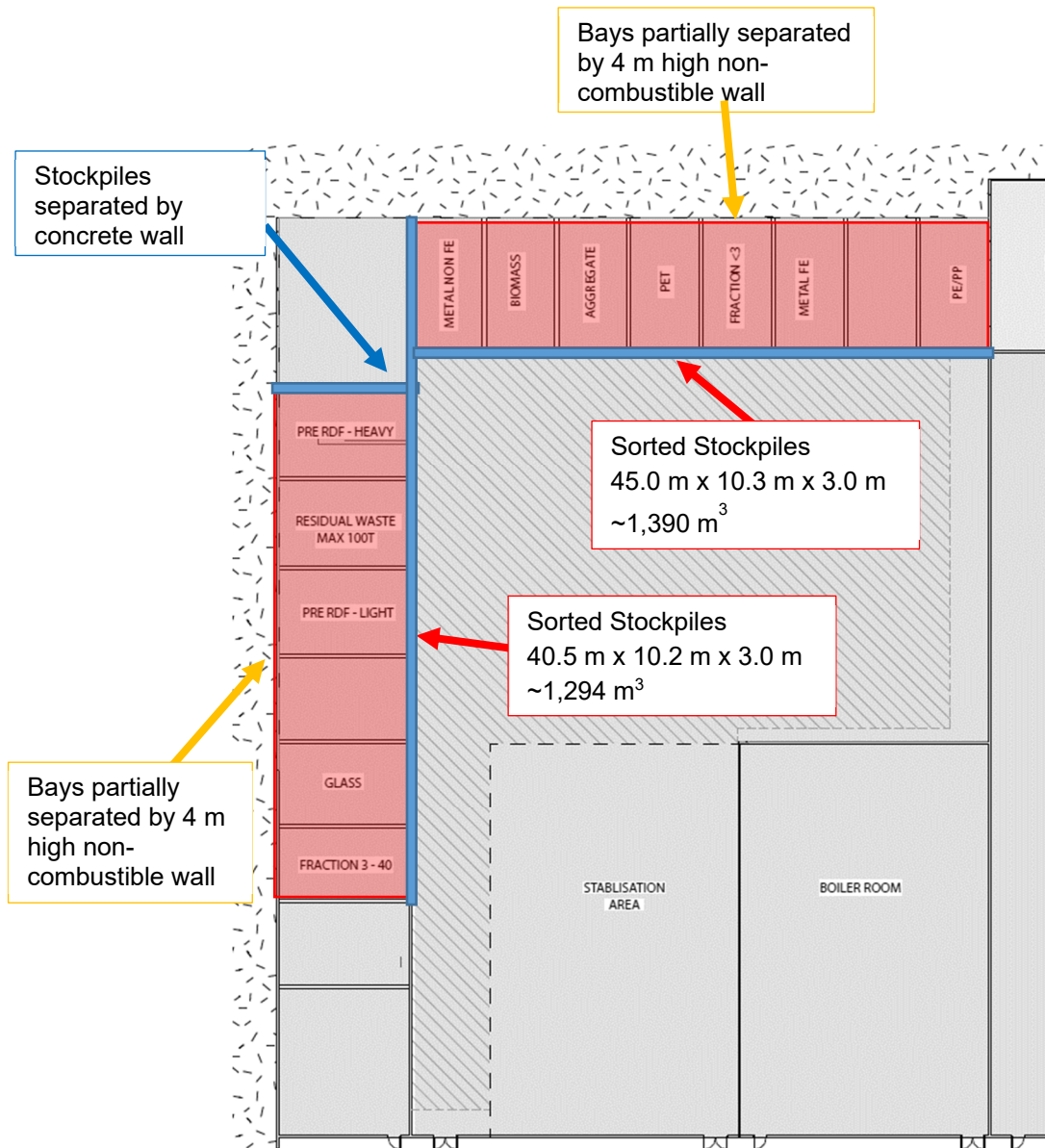


Figure 2.3 Mark-up of stockpile areas (Internal) - Sorting Hall

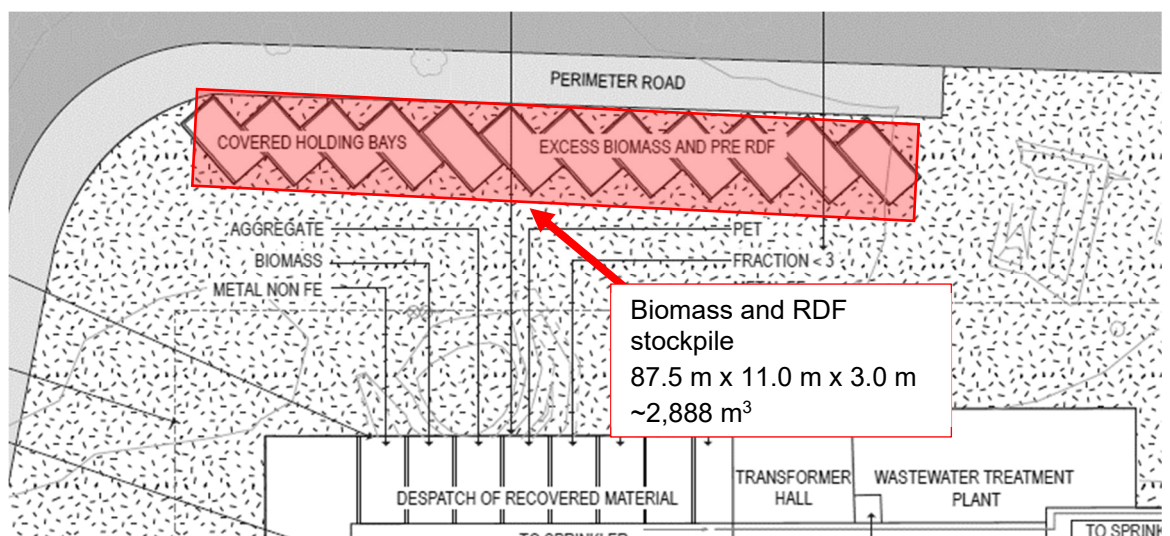


Figure 2.4 Mark-up of stockpile areas (External)

2.3 Summarised preliminary fire safety requirements

Table 2.2 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 site develops, and therefore is preliminary in nature only, and not intended to be an exhaustive list.

Table 2.2 Preliminary fire safety requirements

Fire safety measure	Description
General	If not specifically mentioned the following fire safety measures are to be provided in accordance with the Deemed-to-Satisfy provisions. Please see the BCA Report for details on Deemed-to-Satisfy provisions which apply to this site.
Fire hydrant system	A fire hydrant system shall be provided in accordance with BCA Clause E1.3 and shall be designed to AS2419.1-2005. The following (summarised) FRNSW Guideline requirements shall also apply (see Section 2.3 for details): • In addition to internal coverage requirements, hydrant coverage shall be provided to all external (combustible) stockpiles • The fire hydrant system shall be designed for at least 2 fire hydrants simultaneously flowing (20 L/s). • The fire hydrant system shall provide the above simultaneous flow rate for at least 4 hours minimum duration. • Hydrants shall not be located within 10 m of any stockpiled storage (internal or external).
Fire hose reels	Hose reels shall be provided in accordance with BCA Clause E1.4. The following (summarised) FRNSW Guideline requirements shall also apply (see Section 2.3 for details): • The fire hose reels shall be capable of coverage to internal and external combustible stockpiles. • It is proposed to calculate coverage to combustible stockpiles for fire hose reels based upon the edge of the stockpiles, not the centre.
Fire sprinklers	An automatic fire sprinkler system is required in accordance with BCA Clause E1.5 and Specification E1.5 for the building, and shall be designed to AS2118.1-2017. The following (summarised) FRNSW Guideline requirements shall also apply (see Section 2.3 for details): • The sprinkler system shall be designed for High hazard classification. • Sprinkler water supply time is to be at least 2 hours. • Any awnings attached to the building which cover storage areas, or are adjacent to stockpiles, shall be sprinkler protected, regardless of any exemptions in AS2118.1-2017.
Fire detection	A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 is proposed for the building. Likely provision of aspirating detectors to the materials sorting hall to minimise the potential for false alarms. Upon fire trip, the conveyor belt shall cease to operate, limiting fire spread between different areas of the building.
Smoke hazard management	As per the FRNSW Guidelines, an automatic smoke exhaust system shall be provided to the waste reception hall and provide:

Fire safety measure	Description
	- Exhaust rates are TBD depending on CFD modelling results, but shall be demonstrated to maintain a smoke layer height above 4 m. A smoke clearance system would be proposed for the sorting and sterilisation halls, so long as no storage of waste is present within the halls. The smoke clearance system would be manually operated, and have a rate of one air-change per hour. The following requirements apply to all smoke hazard management systems: - Initiation switches shall 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 must 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 shall be fire rated so fans are capable of operating at 200 °C for 2 hours. - On activation of the fans make up air is to be drawn via permanent openings or automatic opening doors at low levels. These openings must 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 is proposed for the building. Manual alarm points shall be installed throughout the building, adjacent to each exit door.
Perimeter access	Perimeter road access of at least 6 m in width, capable of supporting specialist fire appliance use, shall be provided around each building and external stockpile, as required to satisfy the FRNSW Guidelines.
Combustible stockpile requirements (FRNSW Guidelines)	External (combustible) Stockpiles (see Figure 2.4): - There is one external (combustible) stockpile: - Biomass and RDF - External (combustible) stockpiles are to be limited in size to 50 m in length and 20 m in width (so long as perimeter access is provided on both sides), except where varied through consultation with FRNSW. The following variations are currently proposed: - Biomass and RDF Stockpile, 87.5 m x 11.0 m - Spacing and location of the external (combustible) stockpiles are to adhere to the FRNSW Guidelines, see Section 2.4.22. Internal (combustible) Stockpiles (see Figure 2.3 and Figure 2.2); - Each internal (combustible) stockpile is to be limited in volume to 1,000 m³, except where varied through consultation with FRNSW. The following variations are currently proposed: - Sorted Stockpile (Metals, Biomass, Aggregate, PET, Fraction <3, PE/PP), 1,390 m³ - Sorted Stockpile (RDF, Residual Waste, Glass, Fraction 3-40), 1,294 m³ - Each internal (combustible) stockpile is to be limited in height to 3 m, except where varied through consultation with FRNSW. No variations are currently proposed.

Fire safety measure	Description
	- Separating construction between stockpiles shall be of non-combustible construction and extend at least 1 m above maximum stockpile heights. - Each internal (combustible) stockpile shall maintain a minimum of 6 m unobstructed access on accessible sides.
Fire water containment	An automatic fire water run-off containment system is to be provided and designed to contain the total combined hydraulic demand of the fire hydrant and fire sprinkler systems – approximately 1,000 m ³ .
Operational Requirements (FRNSW Guidelines)	Prior to operations of the facility, Bioelektra shall develop: - An operations plan is to be documented and implemented for stockpile management and a copy is to be included within the Emergency Services Information Package (ESIP). - An Incident Response Management Plan is to be provided for staff and other persons at the facility in the event of fire. - An Emergency Services Information Package (ESIP) is 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 site are to be inspected and maintained with corresponding fire safety statements being issued; The provision of maintenance should be covered in any leasehold contract. AS1851-2012 shall be utilised.

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 Vehicle Access guidelines, references aerial appliance use. The referral guideline for access in this case dictates that carriageway widths throughout the site are to be at least 6 m, sealed and capable of supporting aerial appliance weights. The current design proposes to provide access to the building with a suitable perimeter access for fire appliance use, and indicative 6 m wide pathways.

The current design also allows for close range fire brigade access to the subject building from the perimeter access roads.



Figure 2.5 Indicative mark-up of access for FRNSW vehicles

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

Traffic engineers will 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 will need to be taken into account by designers as the accessways continue to be developed past the EIS stage.

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 is to provide perimeter doors around the building, 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.

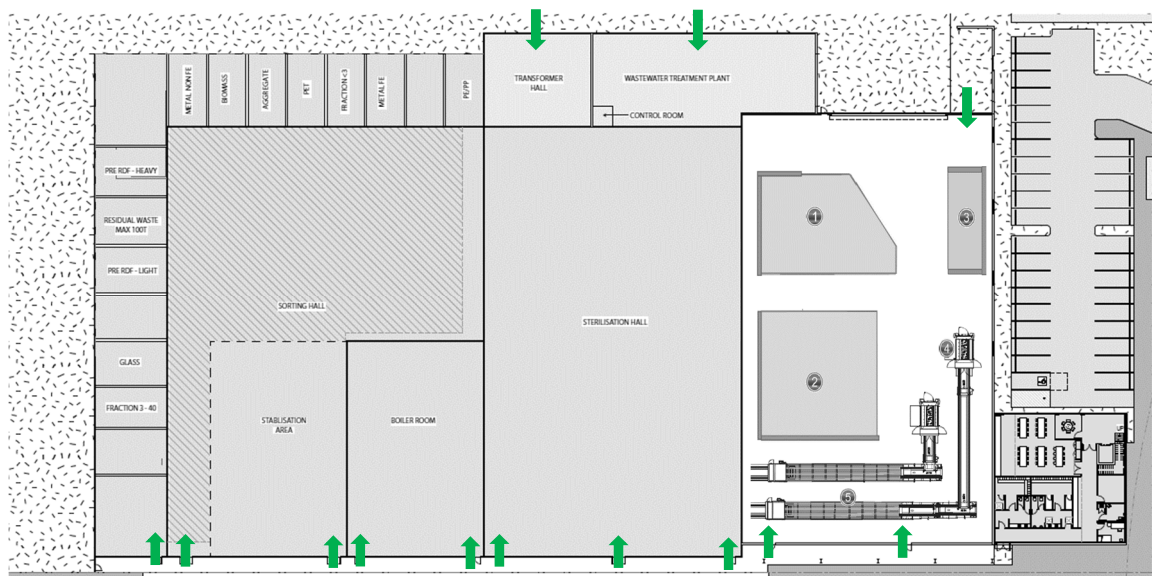


Figure 2.6 Indicative mark-up of building access for FRNSW

Where internal hydrants are necessary in order to achieve AS2419.1 coverage requirements, they would be provided. These would be developed as further detailed 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 are required to be provided with complying hydrant coverage as per AS2419.1. Based upon preliminary layouts, it is anticipated that the hydrant system would utilise external hydrants placed in the proximity to the building, in order to provide internal coverage throughout the building based upon a complying two-hose length design.

The fire hydrant system is proposed to be fed via two fire tanks (combined sprinkler and hydrant), each with a capacity of 584 kl.

While the internal layout will have direct impact as to coverage requirements and would be developed further to ensure compliance as the design progresses, Figure 2.7 shows a preliminary drawing which provides a proof of concept at this time.

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

External combustible stockpiles are required to be provided with external hydrant coverage as per the requirements of the FRNSW Guidelines. A number of hydrants are proposed to be located less than 10 m from combustible stockpiles, however overlapping coverage of hydrants shall support each other. Based upon the current combustible stockpile locations provided, the degree of coverage is illustrated in Figure 2.7.

Note that this is indicative, proof of concept at this stage only, and the hydrant locations are likely to be modified as the design is developed following the EIS stage. However, the guidelines for coverage would be adhered to.

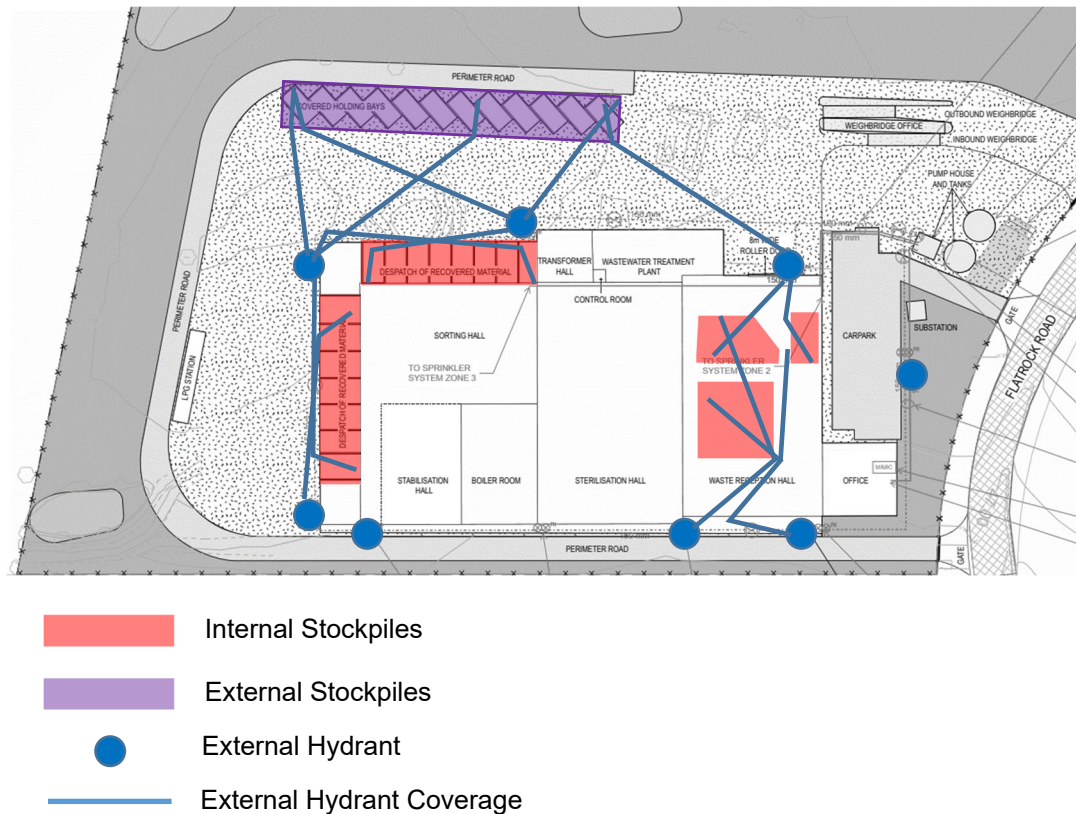


Figure 2.7 Indicative hydrant coverage to combustible stockpiles

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).

Based upon the provided stockpile locations, it is estimated that the area of open yard that would be used for combustible external stockpiles will be in the order of ~965 m². Therefore the hydrant system shall allow for 2 fire hydrants simultaneous flow, as required by Section 7.5.3/Table 2 of the FRNSW Guidelines.

Fire compartment floor area of non-sprinklered building	Area of open yard (used for stockpiles)	No. of fire hydrants required to flow
≤ 500 m ²	≤ 3,000 m ²	2
> 500 m ² ≤ 5,000 m ²	> 3,000 m ² ≤ 9,000 m ²	3
> 5,000 m ² ≤ 10,000 m ²	> 9,000 m ² ≤ 27,000 m ²	4
> 10,000 m ²	> 27,000 m ²	5 (or more)

Table 2 Minimum fire hydrants for non-sprinklered buildings and external storage

Figure 2.8 Excerpt from FRNSW Guidelines

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.

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

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

2.4.7 Fire brigade booster location

The fire brigade booster is proposed to be located adjacent to the designated site entry point. See Figure 2.9.

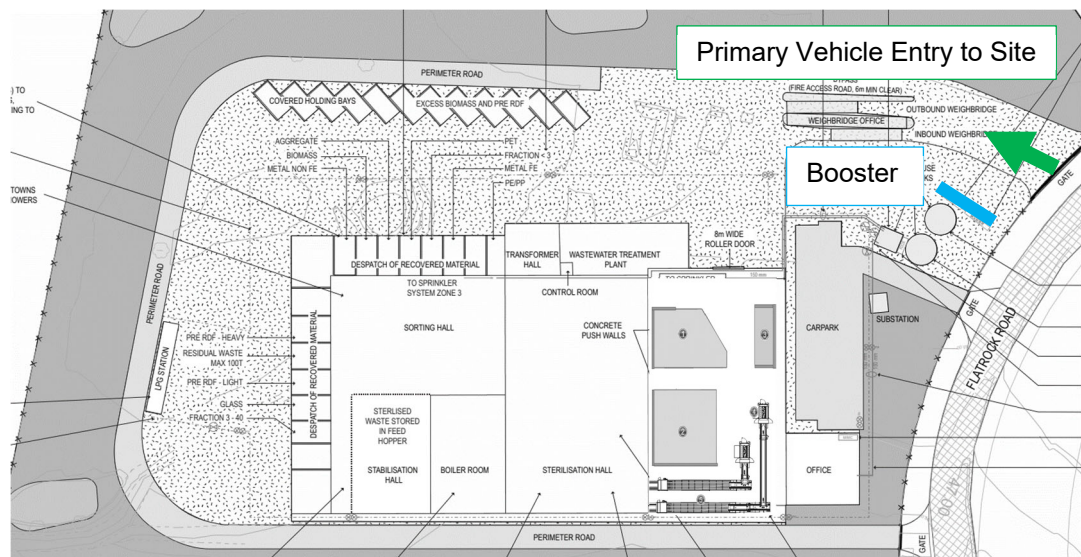


Figure 2.9 Booster location

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

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 require any building on site exceeding 1,000 m² and contains combustible waste material to be provided with a sprinkler system. Therefore, the building shall have a sprinkler system incorporated, including for high hazard as required by the FRNSW Guidelines. This includes all halls and treatment/awning areas attached to the building.

The fire sprinkler system shall be fed from the sprinkler pump house, connected to two fire tanks (584 kl each, totalling 1,168 kl). The tanks shall be refilled through infill connection from the town main. Large bore and small bore connections shall be provided from the tanks.

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 at the front entry to the site, adjacent to the hydrant system booster. See Figure 2.9.

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 the building 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 would be provided to the building.

It is anticipated that thermal detection, or aspirating detectors, will be required in areas of the building, such as the waste halls, to avoid false-alarming, as permitted by AS1670.1.

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 in the building. 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.

The waste reception hall would be provided with a smoke extraction system capable of maintaining the smoke layer above 4 m above floor level. Extraction rates would be subject to detail design prior to construction to determine exact exhaust rate requirements.

The sterilisation and sorting halls are not anticipated to incorporate stockpiles at this time. Therefore, a manually activated smoke clearance system, in lieu of automatic, would be proposed, with the clearance rate being one air-change per hour.

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.

The waste reception hall would be provided with roller doors on two separate walls which will assist with venting de-stratified smoke, as indicated below. The doors shall be automatically opened upon fire detection within the building, with the number of doors to be determined during detailed design prior to issuance of a construction certificate.

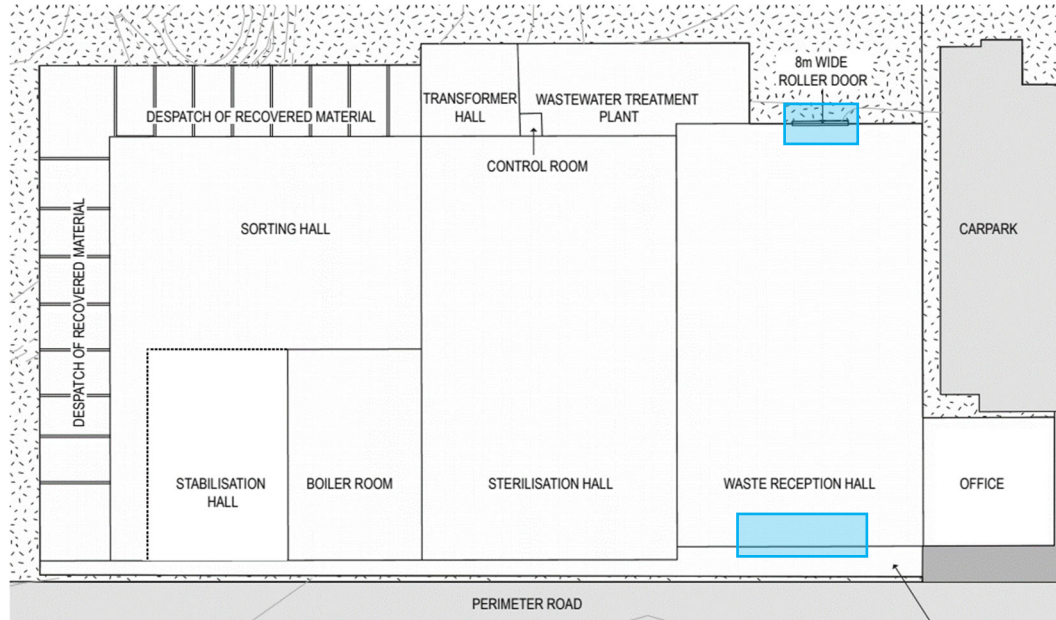


Figure 2.10 Indicative locations of roller shutters available for venting smoke

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 the building, including exhaust fans, drive, flexible connections, control gear and wiring, would be constructed and installed so that it is 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 total water to contain based upon the preliminary design of the fire and sprinkler systems is 738 m³, which is the aggregate flow of 2 hydrant operations for four hours (288 m³ total water flow), and the sprinkler operation within the building for two hours (450 m³ total water flow).

The containment system onsite by the stormwater system therefore shall contain at least 1000 m³, with an automatic isolation valve such that the fire water is contained on the site.

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 shall be connected to the FIP for the site, such that in the event of an alarm, the isolation valve shall 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.

A bushfire assessment has been completed for the site.

The bushfire assessment identified that this site is on bush fire prone land. The assessment noted that the proposed site has a high bushfire risk due to surrounding vegetation and adjoining forest to the east of Flatrock Road.

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.

Separating walls would be designed and installed for the internal stockpiles within the building. The requirements of the FRNSW Guidelines would be applied, with the separating walls extending at least 1 m above and at least 2 m beyond any stockpile. An indicative example is provided in Figure 2.11 and Figure 2.12.

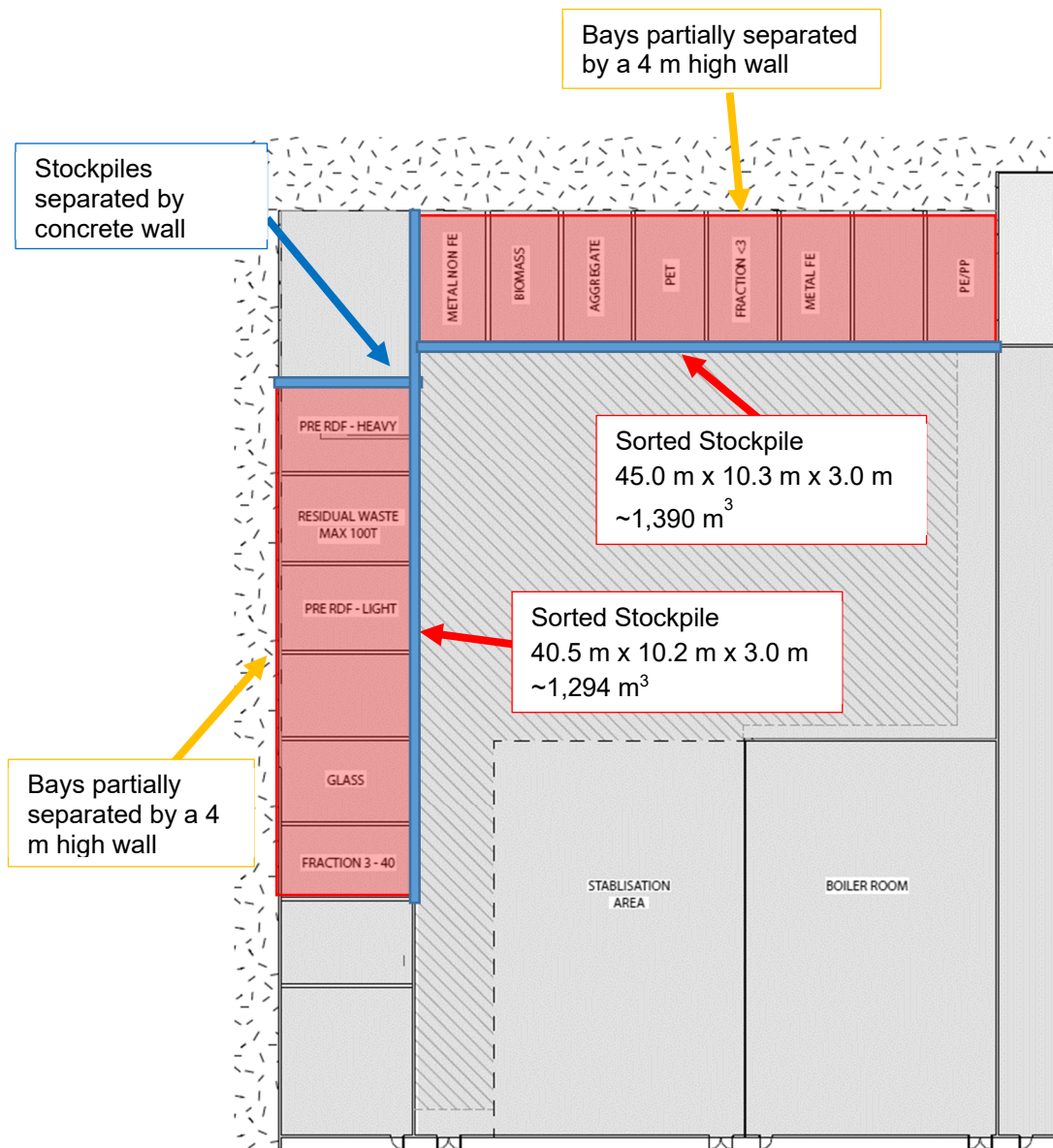


Figure 2.11 Internal Stockpiles and Indicative Separating Walls for Waste Sorting Hall

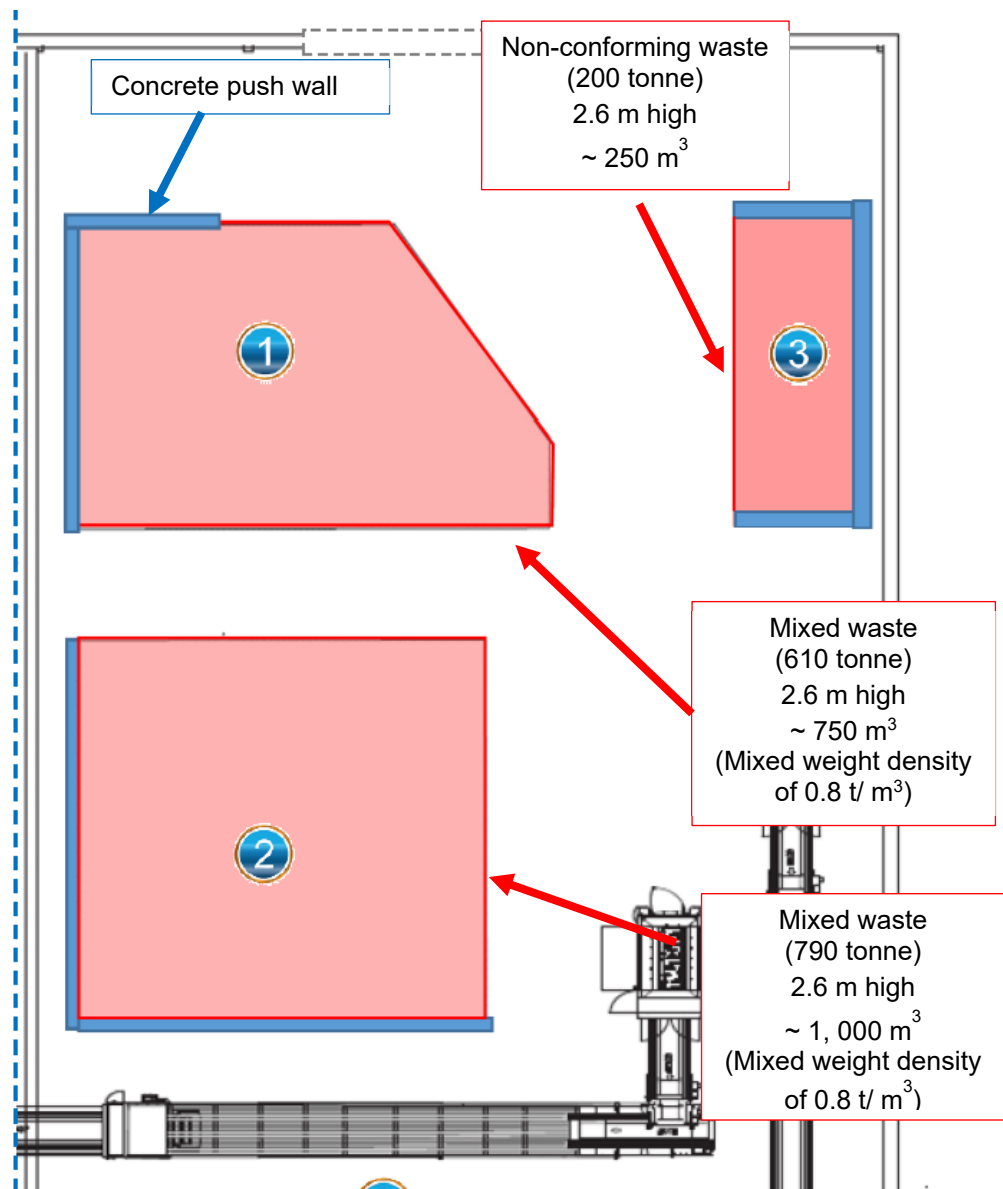


Figure 2.12 Internal Stockpiles and Indicative Push Walls for Waste Reception Hall

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.

No stockpiles are noted for self-heating properties at this time. Biomass is sterilised and therefore should not self-ignite through biological activity.

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.

The length of the external stockpile is 87.5 m in lieu of the maximum permissible of 50 m by the FRNSW Guidelines. The width of the stockpile is 11.5 m, less than the 20 m permitted.

A single external stockpile is situated on site (Biomass and RDF Stockpile). Therefore, minimum separation between external stockpiles is achieved by default.

In terms of separation distance of external stockpiles to other fire source features, the FRNSW Guideline requires an external stockpile with a length of 50 m to maintain a separation distance of 17 m from fire source features (for an ordinary fire risk, stored in loose piles, applicable to the RDF waste).

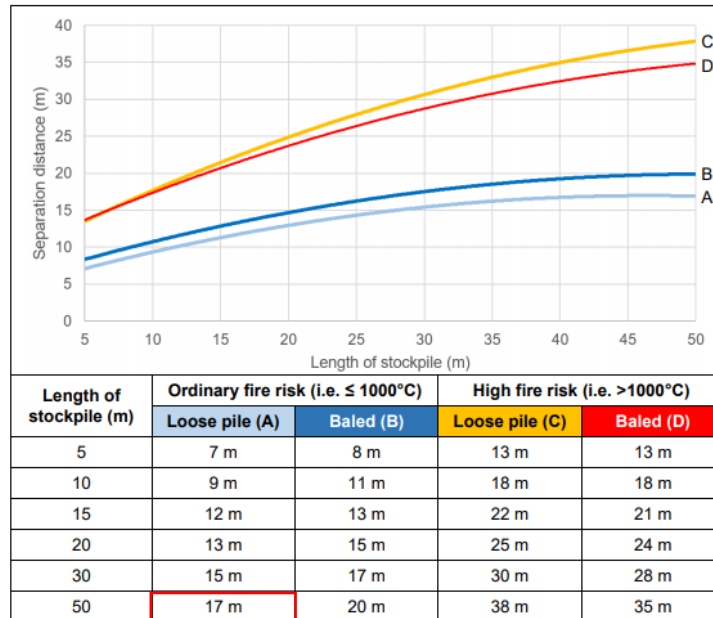


Table 4 Minimum separation between external stockpile and any fire-source feature

Figure 2.13 Separation distance between external stockpile and fire source feature

The distance between the external stockpile to the building is greater than 20 m and therefore capable of complying with the FRNSW guidelines. It is acknowledged that whilst the length of the stockpile exceeds 50 m (87.5 m), the benchmark distance is considered appropriate considering the stockpile consists of several smaller storage units/bins, full perimeter access for fire brigade as shown in Figure 2.14 to fight the fire, and crossover hydrant coverage to be provided.

Internal stockpiles in the receiving hall are proposed to be below the limitation of 1,000 m³. Refer Figure 2.17.

Internal stockpiles adjacent to the sorting hall are proposed to exceed this limitation for both of the stockpiles containing sorted waste. This would be subject to discussions with FRNSW, with the basis for exceeding these limitations being that the building would be provided with a robust sprinkler and smoke hazard management system which would provide suitable means of intervention to offset the extended size of the stockpiles.

It is noted that within each of the two stockpiles, sorted waste is proposed to be partially separated by a 4 m high wall. Stockpiles are separated from the sorting hall by concrete walls as well. See Figure 2.16.

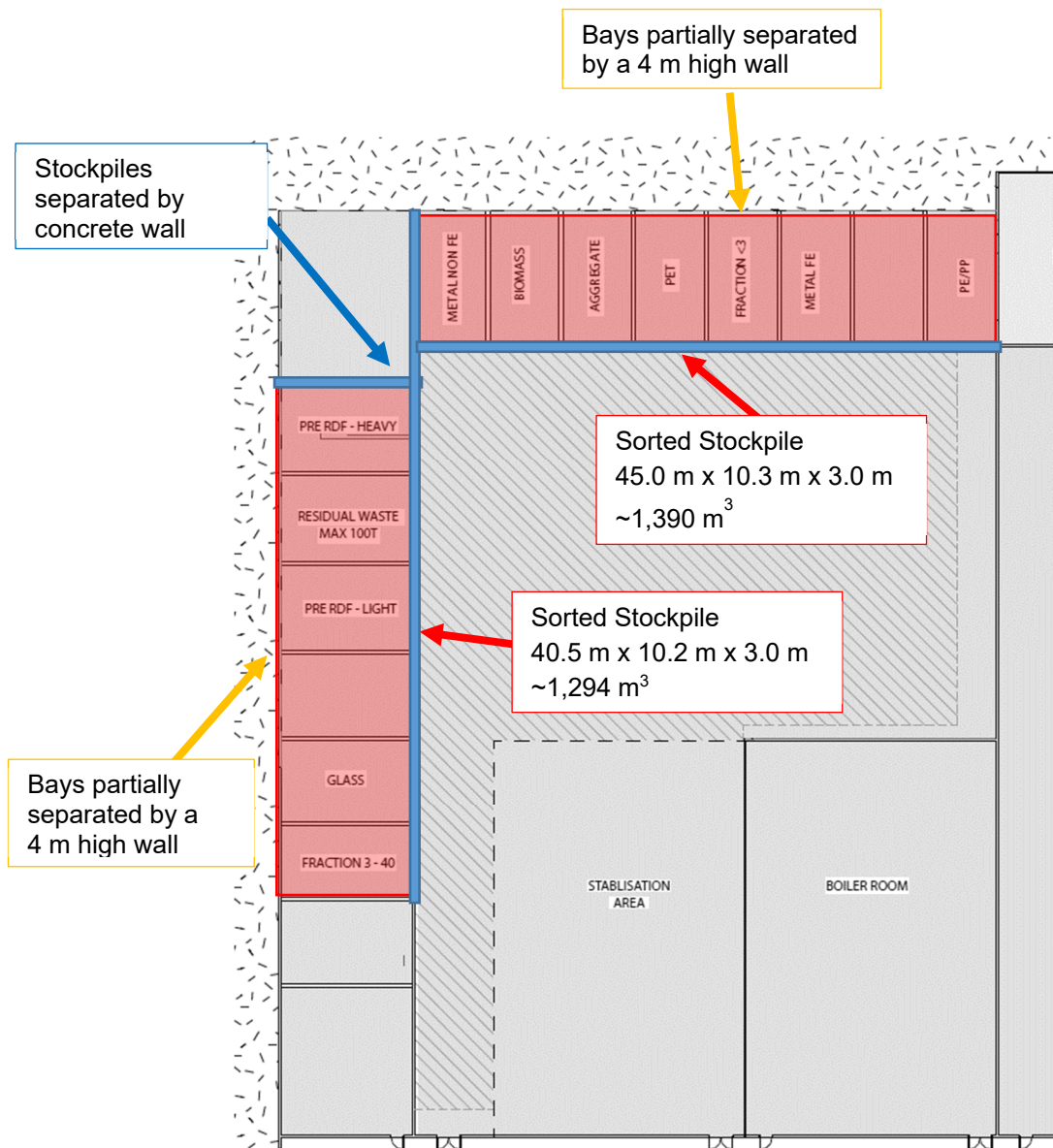


Figure 2.16 Proposed internal stockpile configuration for Waste Sorting Hall

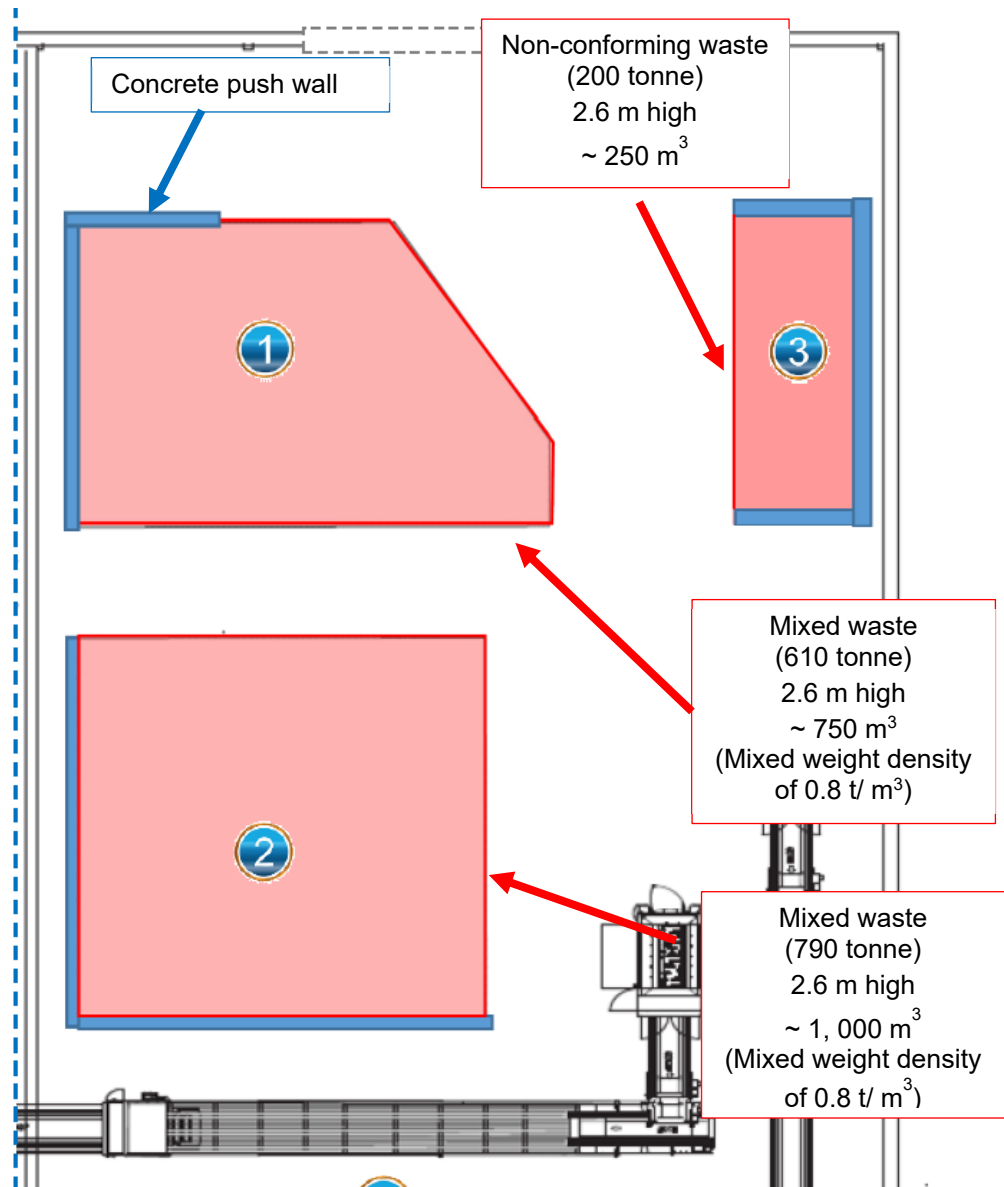


Figure 2.17 Proposed internal stockpile configuration for Waste Reception Hall

Internal stockpile access

Requirement - Internal stockpiles are to maintain a minimum of 6 m unobstructed access on each accessible side.

Each internal stockpile's accessible side would be provided with at least 6 m access, as required. See Figure 2.16 and Figure 2.17.

2.4.25 Operations plan

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

Bioelektra 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.

Bioelektra 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.

Bioelektra 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.

Bioelektra would utilise AS1851-2012 as the base maintenance standard for the fire safety systems onsite, and a maintenance plan be developed prior to the operation of the facility.

2.5 FRNSW Consultation

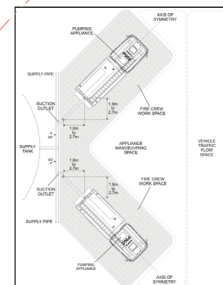
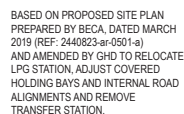
Revision 0 of this Fire Safety Review has been submitted to FRNSW for consultation, and a preliminary meeting was held on 18 May 2021 regarding the application of the guidelines (See Appendix B for meeting minutes, which are currently pending confirmation from FRNSW).

The feedback provided by FRNSW will continue to be developed as the design is progressed, noting that some of the comments have already been integrated into the design following the meeting (e.g. requirement for the shutting off of the conveyor belt on fire trip and that aspirating detectors being likely inclusions now form part of the Preliminary Fire Safety Measures in Table 2.2).

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

Appendices

Appendix A – Fire Services Drawings



HARDSTAND TYPICAL



SK-F001
K.DHIR
22.01.2021

Job Number	12536311
Revision	A
Date	December 2020

Figure 02

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Appendix B – Meeting minutes with FRNSW

Date Meeting Held: 18 May 2021

Location: Teleconference (Microsoft Teams)

Attendance:

FRNSW – Nathan Everett, John Hawes, Troy Ingle

GHD - Colin Thomson, Mark Tsai, Anna Montgomery

Bioelektra – Fred Itaoui and Bass Adasi

Person	Comments
Colin	General introductions
Fred & Bass	Introduced the West Nowra facility and process
Colin	Provided a walk through of the FRNSW Guidelines as they have been applied thus far to this site as per Fire and Incident Management Review document A couple main points: - Perimeter access provided around building, hardstand capable of supporting trucks - Major fire safety systems (detection/hydrant flow/sprinklers), shall comply with requirements as per FRNSW guidelines - Internal stockpiles in waste reception hall to comply with FRNSW Guideline limitations for size/volume/heights/separation. - Sorted stockpiles in hook-lift bins, on external side of sortation hall, treated as 'internal' and would be sprinkler protected. Aggregate area set aside for these sorted piles may exceed 1,000 m³ (~1,390 m³), however each sorted area is separated from each other by 4 m high walls, and most are into hook-lift bins, not loose stockpiles (i.e. true aggregate volume is likely much smaller in each area). - External stockpile approximately 87.5 m x 11.5 m (~1,000 m²). Longer than the 50 m from guidelines, but aggregate area (~1,000 m²) consistent with guidelines and again is primarily hook-lift bins. - Automatic smoke exhaust provided to waste reception hall only (4 m height maintained for >2 hr for smoke layer), smoke clearance system to non-stockpiled halls (will be subject to performance solution). - Hydrant coverage to be provided to all internal and external stockpiles (presence of internal hydrants may be required, depending on layouts, so TBD, but design will start with external hydrants). - The building will be subject to the FEBQ / FER process as the design progresses, therefore later FRNSW consultation will occur. Continued assessment against the FRNSW guidelines will be documented in those reports as well to enable continued feedback once more detailed design is known.
Nathan	- Consideration should be given as to fire separation of the halls for asset protection - Consideration should be given as to how the awning covered area that has waste will be fire separated from the hall - Consideration should be given around redundancy to the pump-sets for asset protection - Recommendation that upon fire trip at the facility (sprinklers/detectors), conveyors are halted to prevent fire spread via conveyor system - Emergency response plans should consider the presence of smaller fuel sources such as mobile phone batteries, and consider implementation of thermal monitoring, or other means, to watch for early, small fire scenarios, and how to respond to such a scenario.

John	- Consideration regarding the fire separation between the halls – what about the penetrations i.e. conveyor? - Consideration as to how to address potential false alarming (<i>CT – Aspirating detection system likely to be required, given dusty environment</i>) - Will the site have provision for large bore suction? - Are there any hydrants on flatrock road, or reticulated water for infill to the tanks? - Site is in a rural area, and note that RFS, if first responders, need 65mm for their suction. Consideration should be given as to how to appropriately cater for suction needs of attending brigade.
Colin	Comments noted above from Nathan and John to be discussed by design team and look how to integrate and address them as the design progresses <i>CT – These comments will also be put into an Appendix of the Guideline Review document, as well as any further FRNSW response to this email.</i>

GHD

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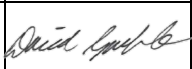
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143/https://projectsportal.ghd.com/sites/pp15_01/bioelektrawestnowrar/ProjectDocs/12536311-RPT_Fire Safety Review.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Mark Tsai Colin Thomson	A Montgomery	on file	D Gamble	on file	28/01/2021
1	Mark Tsai Colin Thomson	A Montgomery		D Gamble		21/05/2021

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