



global environmental solutions

Fire Safety Study  
Resources recovery facility - Minto  
13 Pembury road, Minto

Report Number 610.14692.00521-R01

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Skylife Properties PTY LTD

PO Box 114

Enfield

NSW 2136

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# Fire Safety Study

## Resources recovery facility - Minto

### 13 Pembury road, Minto

#### PREPARED BY:

SLR Consulting Australia Pty Ltd  
ABN 29 001 584 612  
2 Lincoln Street  
Lane Cove NSW 2066 Australia  
(PO Box 176 Lane Cove NSW 1595 Australia)  
T: +61 2 9427 8100 F: +61 2 9427 8200  
sydney@slrconsulting.com www.slrconsulting.com

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## Executive Summary

**NOTE:** This report has been developed to be included as part of the DA submission documentation. This presents a number of limitations for the reports to be finalised in accordance with HIPAP No. 2 as detailed design will not commence until the DA has been approved. It is anticipated that a consent condition would be applied to the application as part of the approvals process. At this point and once the detailed design has been commissioned this report will be finalised to become fully compliant with HIPAP No. 2. Recommendations in this report have been made to take this into consideration.

### Summary of Main Findings and Recommendations

<b>Facility</b>	Minto Resources Recovery Facility
<b>Location</b>	Lot 1, DP1013852. 13 Pembury Road, Minto
<b>Site Size</b>	8,957m <sup>2</sup>
<b>Operator</b>	Minto Recycling Pty Ltd

The Site plans to increase its maximum annual tonnage of general non-putrescible solid waste material from 30,000 tonnes to 220,000 tonnes per annum (tpa). Waste streams currently received by the facility will not alter, only the quantity received. Demolition and building works formed part of the works required to support the proposed increase in capacity.

The existing facility is to be operated by Minto Recycling Pty Ltd. In 2009 the site was approved to be a waste transfer facility with the capacity for 30,000 tpa.

All waste streams will enter the site via the driveway crossing with Pembury Road, where they will be weighed on arrival on the 'eastern' weigh bridge. The contents of trucks will also be visually inspected at this point by the weigh bridge operator. Trucks will then enter into the covered shed / awning and unload. Trucks are then offloaded by either tipping or through bins being tipped to remove contents wholly within the covered shed / awning area. The load will be inspected again on the tipping floor during and after unloading to determine waste acceptability.

Previous communications with Fire and Rescue NSW (FRNSW) on similar projects has identified that they have concerns with developments such as this with the increase in material being handled on site and potential problematic firefighting requirements.

### Main FSS findings

#### Building construction details

<b>Shed Name</b>	<b>A</b>	<b>B</b>	<b>C</b>
Purpose	Storage	Tipping	Processing
Floor Area	930m <sup>2</sup>		2111m <sup>2</sup>
Building height (m)	10.462	10.865	11.184 + 3.047
External walls main shed	The main external wall of the processing shed will be reinforced concrete panels designed to achieve a FRL of 240/240/240. On the front of the building a short section of the wall will be powder coated Colorbond cladding.		
Roof shed	The roof to the main processing shed will be a metal framed roof with powder coated Colorbond sheeting.		
Accessories	Roller Doors at the front of the shed will also be powder coated Colorbond sheeting.		

## Executive Summary

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|--|--|
| Material stored on site                                    | - Metals;<br>- Concrete, Brick and Tile;<br>- Aggregate;<br>- Wood Products;<br>- Plastics;<br>- Paper and Cardboards;<br>- Soils (including VENM, ENM and Recovered Fines);<br>- Glass;<br>- Non recoverable / recyclable materials.  |
| Surrounding Residences and Land use                        | - The site is located within an established industrial precinct<br>- The site is bound by other light industrial and warehousing developments, in all directions except to the west which is bound by Bow Bowing Canal. The site is accessed off Pembury Road in the centre of the industrial precinct.  |
| Identified hazards   | - Diesel (C1) 30,000L tank (required 5m to onsite protected place and 3m to other chemical stores, No ignition sources within 3m of storage and decanting facilities)<br>- LPG (Class 2.1); the site will use an LPG forklift but is not anticipated to store LPG on site. This report considers the potential requirements should LPG be required in the future (requires 0m to onsite protected place and 3m to the nearest other chemical store)<br>- Unprocessed combustible mixed waste stockpile (up to 500 tonnes)<br>- Wood Waste (up to 100 tonnes) stored in waste bays<br>- Paper and Cardboard (up to 50 tonnes) stored in waste bins<br>- Plastic waste (up to 100 tonnes) stored in waste bays<br>- Processed Mixed Waste for landfill (up to 250 tonnes) stored in waste bays |
| LPG Prevention/<br>Detection/<br>Protection<br>Required    | - All installations to be compliant with AS/NZS 1596:2014. Section 4.5 for cylinder storage requirements.<br>- Maintaining separation distances.<br>- Having emergency fire equipment<br>- The use of LPG in forklifts must comply with the requirements of AS4982.  |
| Diesel Prevention/<br>Detection/<br>Protection<br>Required | - All installations to be compliant with AS1940-2004. See Section 5 for storage in tanks. Section 7 for fuel dispensing. Section 9.8 for construction and maintenance.<br>- Maintaining separation distances. (No ignition sources within 3m of storage and decanting facilities. The locations of other chemical stores are greater than 3m from the diesel tank.)<br>- Having emergency fire equipment.<br>- The use of appropriate placards and signage.<br>- Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids.   |

## Executive Summary

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|---|---|
| Fire in main processing shed Prevention/ Detection/ Protection Required | <ul style="list-style-type: none"><li>- Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition.</li><li>- Maintaining good inspections of material entering the site (as per site procedures). Prompt removal of material that could spark or generate an ignition source.</li><li>- Building compliant with the national construction code (volume one)</li><li>- Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed).</li><li>- Having emergency fire equipment.</li><li>- Fire protection system is installed.</li></ul>  |
| Fire prevention measures  | <ul style="list-style-type: none"><li>- The buildings have been designed and will be installed compliant with the requirements of the Building Code of Australia (BCA).</li><li>- Electrical installations will be installed and maintained compliant with relevant Australian Standards, including AS 3000:2007 - Electrical Wiring Rules.</li><li>- Fire extinguishers, hose reels, fire hydrant system and sprinkler system will be installed at designated locations compliant with relevant Australian Standards and BCA.</li><li>- Appropriate warning/identification signs will be installed for fuels and fire protection equipment.</li><li>- Certified diesel tanks will be installed.</li><li>- Diesel fuel tank bund design will include minimum capacities for the applicable storage size of the fuel tank(s).</li><li>- The diesel and LPG storage (i.e. dissimilar fuels) will be separated from each other by greater distances than specified.</li><li>- Annual maintenance and testing will be undertaken.</li><li>- General housekeeping procedures will be regularly undertaken and the areas are kept clear of any combustible materials.</li><li>- Site-specific training for employees and contractors in the use of fire extinguishing/protection equipment.</li></ul> |
| Fire Detection Systems  | <ul style="list-style-type: none"><li>- A smoke detection system in accordance with Clause 4 of Specification E2.2a is required.</li><li>- A building occupant warning system complying with Clause 6 of Specification E2.2a is required</li></ul>  |
| Firefighting LPG  | <ul style="list-style-type: none"><li>- Section 13.4.1 and Table 13.1 AS/NZS 1596:2014 indicate that there are no specific requirements for the storage of cylinders of this volume outside.</li></ul>  |
| Firefighting Diesel   | <ul style="list-style-type: none"><li>- At least one powder-type extinguisher shall be provided and will have a rating of at least 2A 60B(E) (AS/NZS 1841.5) and a capacity of 9kg.</li></ul>   |
| Fire Protection Systems for the processing shed                         | <ul style="list-style-type: none"><li>- Section E1.3 Fire Hydrants national building code volume one 2015 requires a fire hydrant system to be installed</li><li>- Section E1.4 Fire hose reels national building code volume one 2015 requires a fire hose reel system to be provided</li><li>- Section E1.5 national building code volume one 2015 requires a sprinkler system to be installed</li></ul>  |

## Executive Summary

- Water demand calculations**
- source water for fire hydrant installations shall not be less than 2 x 10 L/s for a duration of not less than 4 hours (20 L/s x four hours = 288,000 L)
  - supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver a demand of 0.41L/s for a 25mm hose (Section 6.1 AS2441), for the two most hydraulically disadvantaged fire hose reels operating simultaneously, plus any probable simultaneous flow. (0.41L/s x 2 x 4 hours = 11,808L)
  - Water demand calculations for the sprinkler will need to be calculated in accordance with AS 2118. They are approximately 20,720L/min
  - There must be 1.3mega litres of water available per hour
  - Water supply will be from the local town water supplier through mains water.
- Containment of firefighting water**
- The proposed stormwater management plan details the drainage system for the site and a filtration system to clean storm water before it is released.
  - The drainage system has been designed to include a gate valve to the stormwater pipe where it exits the site.
  - In the event of a fire and the requirement to manage firefighting water, the gate valve can be closed allowing the water to be appropriately managed to prevent offsite contamination.
  - Consideration has been given to the containment of fire water along the western boundary and preventing any runoff entering directly into the Bow Bowing Canal. The site drains to the east and therefore is unlikely to present a risk to the canal from fire water runoff.
- First aid and emergency planning**
- As part of the site commissioning, the site emergency plan will be updated to include the additional information.
  - In the event of a fire emergency, the emergency services must be contacted immediately by telephoning "000" if the incident presents an immediate threat to human health or property.
  - The Site Office can act as an Emergency Control Centre if required.
  - An Emergency Resource Pack containing up-to-date copies of:
    - o The quantity and location of LPG being stored
    - o The quantity and location of Diesel being stored
    - o The Emergency Plan, including the upfront Emergency Services Information Package

## Recommended works

Work No.	Recommendation	Required by date
1	Confirm the fire hydrant design and water capacity meets the requirements of this report Confirm the current fire hose reels meets the requirements of this report	Finalisation of detailed design
2	Meet with the local brigade to discuss their requirements and needs for incorporation into the detailed design.	Finalisation of detailed design
3	Complete the Fire Hose Reel design	Finalisation of detailed design
4	Confirm in writing that the local town supply will cope with the water requirements	Finalisation of detailed design

## Executive Summary

<b>Work No.</b>	<b>Recommendation</b>	<b>Required by date</b>
5	Develop the fire hose reel and fire extinguisher protection requirements	Finalisation of detailed design
6	Update the current emergency plan	As part of the site commissioning
7	Provide confirmation/certification/letter of compliance that the Diesel tank has been installed in accordance with AS1940 and that separation distances are appropriate.	As part of the site commissioning

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### GLOSSARY AND ABBREVIATIONS

<b>Abbreviation/ Acronym</b>	<b>Description</b>
AS & AS/NZS	Australian Standards / New Zealand Standards
ADGC	Australian Dangerous Goods Code
BCA	Building Code Australia
DA	Design Application
DG	Dangerous Goods
DP	Deposited Plan
DP&E	NSW Department of Planning and Environment
DoP	Department of Planning
DUAP	Department of Urban Affairs and Planning
EIS	Environmental Impact Statement
EPL	Environment Protect Licence
FRNSW	Fire and Rescue NSW (formally NSW Fire Brigades)
FRL	Fire Resistance Level
FSS	Fire Safety Study
HIPAP	Hazardous Industry Planning Advisory Paper
LEP	Local Environment Plan
LGA	Local Government Area
LPG	Liquid petroleum gas
L/s	Litres per second
NCC	National Construction Code
NSW	New South Wales
OEMP	Operational Environmental Management Plan
PCA	Principal Certifying Authority
PHA	Preliminary Hazard Analysis
POEO Act	Protection of Environmental Operations Act 1997
PPE	Personal Protective Equipment
PRS	Preliminary Risk Screening
SEPP	State Environmental Planning Policy
SLR	SLR Consulting Australia Pty Ltd
SDS	Safety Data Sheets
SSD	State Significant Development
TBC	To Be Confirmed
tpa	Tonnes per annum

## 1 INTRODUCTION

**NOTE:** This report has been developed to be included as part of the DA submission documentation. This presents a number of limitations for the reports to be finalised in accordance with HIPAP No. 2 as detailed design will not commence until the DA has been approved. It is anticipated that a consent condition would be applied to the application as part of the approvals process. At this point and once the detailed design has been commissioned this report will be finalised to become fully compliant with HIPAP No. 2. Recommendations in this report have been made to take this into consideration.

### 1.1 Proposed development

A SEARS has been issued by the Director General of Department of Planning for the development application to increase the capacity of the Minto Resources Recovery Facility an established “waste or resource management facility” at 13 Pembury Road, Minto (hereafter referred to as the site).

The Site plans to increase its maximum annual tonnage of general non-putrescible solid waste material from 30,000 tonnes to 220,000 tonnes per annum (tpa). Waste streams currently received by the facility will not alter, only the quantity received. Demolition and building works formed part of the works required to support the proposed increase in capacity.

### 1.2 Fire and Rescue NSW

Previous communications with Fire and Rescue NSW (FRNSW) on similar projects has identified that they have concerns with developments such as this with the increase in material being handled on site and potential problematic firefighting requirements.

Previously FRNSW have noted that due to the nature of a facility like this, FRNSW personnel will have to pro-actively manage an incident of fire and the subsequent containment of polluted fire water runoff.

### 1.3 Site details

Summary details of the Development subject to this *Fire Safety Study* are presented in **Table 1**. A site location plan is provided as **Figure 1** with a site layout plan provided as **Figure 2**.

**Table 1 Facility Subject to this Fire Safety Study**

<b>Facility</b>	Minto Resources Recovery Facility
<b>Location</b>	Lot 1, DP1013852. 13 Pembury Road, Minto
<b>Site Size</b>	8,957m <sup>2</sup>
<b>Operator</b>	Minto Recycling Pty Ltd

## 2 SCOPE OF REPORT

### 2.1 Aims and Objectives

This *Fire Safety Study* aims is to establish the adequacy and requirements of fire safety proposals for the Development to ensure the fire prevention, detection, protection and fighting measures are appropriate for the specific fire hazard at the Development. The key objectives of the *Fire Safety Study* are:

- To identify the fire hazards and consequences of possible fire incidents;

- To identify the proposed fire prevention strategies and measures;
- To analyse the requirements for fire detection and protection and identify the specific measures to be implemented;
- To calculate the firefighting water supply and demand;
- Containment of firefighting water; and
- First aid fire protection requirements.

## 2.2 Regulatory Requirements

The general format and content of this *FSS* is in accordance with the requirements of the *HIPAP No.2 – Fire Safety Study Guidelines* (Department of Planning [DoP] 2011) to a level of detail commensurate with the nature of the Development and level of risk for an emergency situation.

**Table 2** lists the key features of emergency plans in accordance with HIPAP 2 and where each of these requirements have been addressed in this document.

**Table 2 HIPAP 2 Key Information Requirements**

Detail Required	FSS Section
Formal document control procedures;	Page ii
A clear summary of findings and recommendations;	Executive Summary
A description of the facility, including its processes, layout and location drawings;	Section 3, Appendix A
Identification of flammable materials, fire scenarios that can arise and their consequences;	Sections 6 and 7
A description of the fire prevention and mitigation strategies;	Section 8
Details of the fire system and demonstration of its adequacy to cope with the identified fire scenarios; and	Section 9
Arrangements for containing contaminated fire water.	Section 12

## 2.3 Other Relevant Studies

This *Fire Safety Study* should be read in conjunction with a number of relevant studies including:

- SEARS application letter (APP Dec 2015)
- *Preliminary Risk Screening and Hazard Assessment* (SLR 2016);
- Architectural plans (insight 2016); and
- Burgess Arnott & Grava storm water concept plan (2016), drawing No. 2016-014-H1

## 3 DESCRIPTION OF THE FACILITY

### 3.1 Current site setting

The existing facility is to be operated by Minto Recycling Pty Ltd. In 2009 the site was approved to be a waste transfer facility with the capacity for 30,000 tpa.

In accordance with the DA approval and the EPL, the existing facility receives and separates suitable non-putrescible general solid waste into different waste categories. Products are then transferred to other facilities for reuse, further resource recovery or to a licensed landfill.

### 3.2 Operational Activities

All waste streams will enter the site via the driveway crossing with Pembury Road, where they will be weighed on arrival on the 'eastern' weigh bridge. The contents of trucks will also be visually inspected at this point by the weigh bridge operator. Trucks will then enter into the covered shed / awning and unload. Trucks are then offloaded by either tipping or through bins being tipped to remove contents wholly within shed B. The load will be inspected again on the tipping floor after unloading to determine waste acceptability.

Covered bins containing wastes may also be stored in the designated bin storage area and moved to the processing area or transported off site when operations permit processing. Under such circumstances, the bin would be covered and held in the designated bin storage area until such time as it can be accepted for processing.

All loading, unloading and sorting activities are to be carried out within sheds B and C. Any non-complying waste identified will be managed in accordance with SEQ procedures and the adopted Operations Environmental Management Plan and Asbestos and Non-Complying Waste Management Procedure.

Once trucks have exited the unloading area operations staff commence to separate waste into streams of recyclable and recoverable products that are then stockpiled in the designated material bays in Shed A. Sorting and processing operations will result in wastes being separated into for example, the following products that will be stored in the designated material bays:

- Metals;
- Concrete, Brick and Tile;
- Aggregate;
- Wood Products;
- Plastics;
- Paper and Cardboards;
- Soils (including VENM, ENM and Recovered Fines);
- Glass;
- Non recoverable / recyclable materials.

After sorting and processing, the product materials are reloaded and transported off site via the 'western' weighbridge for reuse elsewhere. Based on existing operations and other facilities owned, approximately 10 - 15 percent of waste will be transported to landfill.

The anticipated breakdown of waste streams received is provided in **Table 3**.

**Table 3 Predicted Waste Streams (annual)**

Material	Volume (TPA)*	Percentage*
Wood Waste	4,400	2%
Non Chemical Manufacturing waste	4,400	2%
Asphalt Waste	2,200	1%
Soils	22,000	10%
Paper and Cardboard	1,100	0.5%
Glass, plastic, rubber, plasterboard etc.	1,100	0.5%
Household waste from clean up	4,400	2%
Office and Packaging Waste	4,400	2%

Material	Volume (TPA)*	Percentage*
Building and Demolition Waste	165,000	75%
VENM	11,000	5%
<b>TOTAL</b>	<b>220,000</b>	<b>100%</b>

\* % obtained from APP with revised tonnage based on revised information 10/03/2017

Once deemed acceptable, unprocessed waste will be contained within the processing building in stockpiles prior to processing, or held within covered bins in the designated bin storage area. Processed waste (separated and sorted) will be stockpiled in the designated material bins. It is expected that no more than **10,000 tonnes** of waste will be held on site at any one time. **Table 4** provides predicated waste quantities held on site at any one time.

**Table 4 Predicted Waste Streams (any one time)**

Material	Volume (T)
Wood Waste	200
Non Chemical Manufacturing waste	200
Asphalt Waste	100
Soils	1,000
Paper and Cardboard	50
Household Waste (Municipal Clean Up)	250
Office and Packaging Waste	200
Building and Demolition Waste	7,500
VENM	500
<b>TOTAL</b>	<b>10,000</b>

Any waste streams not permitted to be kept on site will be rejected and subsequently reloaded before leaving the site. The following waste streams will not be accepted on site:

- Asbestos;
- Liquid Wastes;
- Putrescible Wastes;
- Flammable Materials;
- Hazardous Wastes; and
- Radioactive Wastes.

### 3.3 Fuel, Plant and Equipment

Approximately **30,000 litres of diesel** is to be stored on site. The site will use an LPG forklift but is not anticipated to store LPG on site. This report considers the potential requirements should LPG be required in the future (a maximum of 4 x 15kg gas bottles plus 2 x 15kg empty cylinders).

The diesel fuel tank is to be contained in a bunded area separate from other flammable liquids. The designated diesel storage area is illustrated on the proposed Site Plan (**Figure 2**).

In addition to plant and equipment required to enable processing, the following equipment / technology will be deployed to mitigate impacts associated with waste processing operations:

- 'Cool Fog' Misting System within the processing building;
- Sprinkler systems to cover manoeuvring areas within the yard;

- Stormwater 360 filtration system;

### 3.4 Construction details

The site consists of three sheds. **Table 5** provides details on the construction and size of the sheds.

**Table 5 Building details**

Shed Name	A	B	C
Purpose	Storage	Tipping	Processing
Floor Area	930m <sup>2</sup>	2111m <sup>2</sup> (combined B&C)	
Building height (m)	10.462	10.865	11.184 + 3.047
External walls main shed	The main external wall of the processing shed is reinforced concrete panels designed to achieve a FRL of 240/240/240. On the front of the building a short section of the wall is powder coated Colorbond cladding.		
Roof shed	The roof to the main processing shed is a metal framed roof with powder coated Colorbond sheeting.		
Accessories	N/A		

The maximum height of the buildings is illustrated in **Figure 3**.

### 3.5 Staff

A total of 12 full time staff will be employed on site.

### 3.6 Water Catchment

The site is located adjacent to Bow Bowing Canal.

## 4 SURROUNDING LAND USES AND ZONING

### 4.1 Site location

Under the provision of the Campbelltown Local Environmental Plan (CLEP) 2015, (see **Figure 4**) the site is Zoned 4(a) General Industrial. The site is located within an established industrial precinct, Minto industrial Estate.

The site is bound by other light industrial and warehousing developments, in all directions except to the west which is bound by Bow Bowing Canal. The site is accessed off Pembury Road in the centre of the industrial precinct.

### 4.2 Uses permissible with consent in the Light Industrial zone include:

Depots; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Hospitals; Industrial training facilities; Landscaping material supplies; Light industries; Liquid fuel depots; Neighbourhood shops; Plant nurseries; Roads; Rural supplies; Take away food and drink premises; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4

### 4.3 Land uses prohibited in the Light industrial zone are:

Amusement centres; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Community facilities; Correctional centres; Eco-tourist facilities; Environmental facilities; Exhibition homes; Exhibition villages; Function centres; Hazardous industries; Health services facilities; Heavy industrial storage establishments; Highway service centres; Home-based child care; Mooring pens; Moorings; Offensive industries; Recreation facilities (major); Registered clubs; Residential accommodation; Respite day care centres; Rural industries; Schools; Tourist and visitor accommodation; Wharf or boating facilities

### 4.4 Neighbouring Premises

The surroundings are characterised by a mix of industrial developments including automotive servicing, manufacturing and warehousing. The industrial nature of the surrounding developments means they would not be considered as sensitive in the way that an office, school or hospital would be, hence this report focusses on potential impacts at the nearest residential receivers.

The nearest residential receivers are located 344m to the west.

**Table 6 Neighboring Premises**

Direction	Distance (approx)	Company/ Operations	Use of Premises	Land Use Category
North	Up to 600m	General Industrial	General industry	General Industrial 1N1
North	600m to 1000m	General Industrial	General industry and Retail	Light Industrial 1N2
North East	Up to 1300m	General Industrial	General industry	General Industrial 1N1
East	Up to 1100m	General Industrial	General industry	General Industrial 1N1
South East	Up to 1200m	General Industrial	General industry	General Industrial 1N1
South	Up to 1850m	General Industrial	General industry	General Industrial 1N1
South West	Up to 600m	General Industrial	General industry	General Industrial 1N1
South West	660m	General Industrial	Residential	Residential
West	Up to 344m	General Industrial	General industry	General Industrial 1N1
West	344 m	General Industrial	Residential	Residential
North West	Up to 450m	General Industrial	General industry	General Industrial 1N1

## 5 HAZARD ASSESSMENT

This section provides a summary of the PRS and PHA undertaken by SLR Consulting Australia Pty Ltd. A preliminary risk screening assessment of the proposed storage quantities and delivery frequencies of dangerous goods proposed to be used on site was undertaken by SLR (SLR 2016).

### 5.1 Dangerous Goods Storage

The proposed inventory of Dangerous Goods (DG) in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) is provided in **Table 7** below.

The information contained in the table compares the total storage quantity of the required dangerous goods classes against the storage screening threshold applying SEPP 33 (DUAP 1994, and updated guidelines, NSW Planning, 2011).

The dangerous goods to be stored on the site were grouped into their respective ADGC classes. If more than one packaging group was present in an DG class it was assumed that the total amount for that class was the more hazardous packing group.

**Table 7 Inventory of Dangerous Goods**

Substance	Dangerous Goods Class	Packing Group	Total Storage on Site	Threshold Quantity	SEPP 33 Threshold Level Findings
LPG	2.1	N/A	100kg	10 tonne (above ground storage)	Below
Diesel	C1	N/A	30,000 litres	Not applicable	Not applicable

Diesel is a class C1 combustible liquid and, as described in applying SEPP 33, is not considered to be potentially hazardous when stored in a separate bund or within a storage area where it is the only combustible liquid present. As it is proposed to locate the 30,000 litre diesel storage tank within a bund area isolated from any other flammable liquids the storage of diesel on site is not considered to be potentially hazardous.

The proposed bund area will have a capacity of 36,000 litres and will be roofed to ensure capacity is not affected by rainwater. The diesel storage tank area and bund will be designed and constructed to satisfy the requirements of AS1940-2004 - The storage and handling of flammable and combustible liquids. This standard contains the minimum acceptable safety requirements for storage facilities, operating procedures, emergency planning and fire protection.

The proposed dangerous goods planned to be stored on site are below the screening thresholds and therefore not considered to be potentially hazardous.

## 5.2 Transportation of Dangerous Goods

In applying SEPP 33 a proposed development may be deemed potentially hazardous if the numbers of generated traffic movements for significant quantities of dangerous goods entering and leaving the site are above the cumulative vehicle movements shown in Table 2 of the SEPP 33 guideline.

SLR has been advised there will be no transport of Dangerous Goods to the site other than to replenish the good specified above in **Table 7**.

Note: Diesel is not a Dangerous Good for the purposes of transport (ADGC 3.2.5.4.4) however for reporting purposes vehicle movements will be  $\leq 1$  per week.

## 5.3 Preliminary risk screening conclusion

The report reviewed and applied the requirements of SEPP 33 in order to determine whether the policy applies to the Project.

The SEPP33 screenings for storage of dangerous goods indicate that the development would not be classified as a hazardous or offensive industry due to the limited amount of chemicals stored on site.

## 5.4 Mitigation and Management Measures

To ensure the risks associated with the storage of potentially dangerous goods are not increased, the following measures are proposed:

- Storage of diesel fuel will be limited to 30,000L;
- Diesel fuel will be stored within a bunded area with sufficient capacity in isolation of any other flammable liquids, dangerous goods and / or hazardous chemicals;

- The diesel storage tank area and bund will be designed and constructed to satisfy the requirements of AS1940-2004 - The storage and handling of flammable and combustible liquids;
- Certification addressing the design, construction and installation of the aboveground diesel storage tank in the context of any relevant Australian Standards will be provided as part of the planning process.
- The site is an existing operation and has Emergency and Pollution Incident Response Management Plans, which will be updated to reflect the development and proposed operations.

## 6 IDENTIFICATION OF FIRE HAZARDS

**Table 8** provides a summary of the storage quantities and requirements of LPG and diesel. All other chemicals stored on site are considered small quantities (oils and greases for servicing) and unlikely to present a hazard. Storage of small quantities of chemicals are considered in **Section 8.4**.

**Table 8 Chemical storage assessment**

Substance (DG Class)	Total Volume applicable	Storage Requirements	Specified Distance requirements		Separation distances and tank groups (same substance)
			On-site protected place	Other Chemical Stores	
Diesel (C1)	30,000L	Above Placard Quantity AS1940)	5m (Table 5.4 AS1940)	Diameter of the tank or 7.5m, whichever is less, but at least 3m (Table 5.3 AS1940)	600mm (section 5.7.6 (b) AS1940)
LPG (Class 2.1)	216L (4 x 15kg full cylinders + 2 x 15kg empty cylinders)	Above minor storage quantities (AS/NZS 1596:2014) below placard quantities.	0m (Table 4.1 AS/NZS 1596:2014)	3m (Section 4.5.3 (b) AS/NZS1596:2014)	Groups of 2,500 L water capacity separated by 3m (Section 4.4.5 (b) AS/NZS 1596:2014

Non dangerous goods combustible substances that are present on site and may present a fire risk relevant to this FSS are presented in **Table 9**.

**Table 9 Non DG combustible substances**

Substance	Volume of combustible material at any one time (tonnes)	Storage
Potential combustible material as unprocessed mixed waste	500	Unprocessed mixed waste stockpiles (note that 4,500 tonnes of waste is non-combustible)
Wood Waste	100	Waste located in a material specific storage bays (note that 4,500 tonnes of waste is non-combustible)
Plastic	100	
Paper	25	
Cardboard	25	
Processed mixed waste (for landfill)	250	
<b>Total</b>	<b>1,000</b>	

Quantities taken from **Tables 3 and 4**, noting that the majority of material will be demolition waste (concrete, brick, soil etc.). Stockpiled waste vs processed waste will be approximately 50/50 split.

## 7 CONSEQUENCE OF INCIDENTS

**Table 10** provides an assessment of the fire hazards, possible consequences and prevention, detection, and protection systems considered appropriate for the site.

**Table 10 Fire Hazard Assessment**

Facility/ Event	Cause/ Comment	Possible results/ Consequences	Prevention/ Detection/ Protection Required
Rupture of gas Cylinder	Puncture of cylinder while in storage	Leak/release of LPG to atmosphere resulting in ignition	All installations to be compliant with AS/NZS 1596:2014. Section 4.5 for cylinder storage requirements. Maintaining separation distances as identified in <b>Table 8</b> . Having emergency fire equipment as defined in <b>Section 8</b> . The use of LPG in forklifts must comply with the requirements of AS4982.
Leak of diesel into bund and subsequent ignition	Overfilling tank Corrosion of tank Pressure vent fails External ignition sources	Leak or rupture of tank Ignition of diesel and resulting fire Damage to plant, equipment, buildings etc. Loss of production/ operation	All installations to be compliant with AS1940-2004. Section 5 for storage in tanks. Section 7 for fuel dispensing. Section 9.8 for construction and maintenance. Maintaining separation distances as identified in <b>Table 8</b> . (No ignition sources within 3m of storage and decanting facilities. The locations of other chemical stores are greater than 3m from the diesel tank.) Having emergency fire equipment as defined in <b>Section 8</b> . The use of appropriate placards and signage. Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids.
Fire in main processing shed	Ignition due to friction / impact Ignition due to unknown substances in delivery load Ignition of faulty equipment/plant	Fire starting in unprocessed mixed waste stockpile (in the main processing shed) can migrate into the waste bays increasing the complexity for fighting the fire. Damage to plant, equipment, buildings etc. Loss of production/ operation	Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition due to friction. Maintaining good inspections of material entering the site (as per site procedures). Prompt removal of material that could spark or generate an ignition source. Building compliant with the national construction code (volume one) Have a prestart check process for all mobile and fixed plant. Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed). Having emergency fire equipment as defined in <b>Section 8</b> . Fire protection system will be installed as detailed in <b>Section 9</b> .
Fire in storage bays (in waste)	Trespassers/ Arson	The fire could spread into the main	Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition

Facility/ Event	Cause/ Comment	Possible results/ Consequences	Prevention/ Detection/ Protection Required
bins)	Ignition from the spread of fire on site	processing area. Damage to plant, equipment, buildings etc. Loss of operation	due to friction. Building compliant with the national construction code (volume one) Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed). Having emergency fire equipment as defined in <b>Section 8</b> . Fire protection system will be installed as detailed in <b>Section 9</b> .
Small fires associated with maintenance works	Ignition of combustible/ flammable material arising from hot works (welding, grinding etc.) being undertaken	Localised fires inside workshop Localised fires could spread to outside areas Damage to plant, equipment, buildings etc. Loss of operation	Hot works to be undertaken under a permit to work system and properly risk assessed. Good housekeeping removing refuse and/or other combustible material for working areas. Provision of firefighting equipment and appropriate training for staff. Having emergency fire equipment as defined in <b>Section 8</b> . Fire protection system will be installed as detailed in <b>Section 9</b> .

## 8 FIRE PREVENTION STRATEGIES / MEASURES

The following sub-sections outline some of the key pre-emptive actions (i.e. mitigation measures and management strategies) that Minto Recycling Pty Ltd has committed to implementing in order to minimise the risk for fire situations.

### 8.1 LPG Management

The requirements of AS/NZS 1596:2014 regarding the handling of a fire emergency involving LP Gas storages are based on the following elements:

- I. Rapid evaluation of the nature of the fire is imperative.
- II. If it is an adjacent fire in some other structure or material, then the problem is whether the heat radiation to the cylinders are sufficient to require remedial action.
- III. If gas is escaping the priority tasks are to prevent escalation, to stabilize, then to terminate.
- IV. If stability can be achieved, there is nothing wrong with letting the gas burn if it is doing no harm, even to the extent of burning off all the stored gas if this is the safest thing to do.
- V. If the situation appears to be escalating, evacuation needs to be considered.
- VI. Spray systems can protect against incident radiation, but should not be relied upon to cope with a concentrated flame impingement.

As outlined in **Section 5**, SLR undertook a *Preliminary Risk Screening* (SLR 2015c) in accordance with SEPP 33 and also a *Preliminary Hazard Analysis* (SLR 2015c) in accordance with HIPAP 6 as part of the EIS (SLR 2015a).

The SEPP33 screenings for storage of dangerous goods indicate that the development would not be classified as a hazardous or offensive industry due to the limited amount of LPG stored on site and the transportation of the LPG to site.

## 8.2 Diesel Management

The site is proposed to hold a single 30,000L diesel tank to supply site vehicles with fuel. The tank will be located outside within a bunded area capable of holding 120% of the tanks capacity. Construction and storage requirements for the tanks will comply with the requirements of Section 5 AS1940 – 2004.

Fuel is likely to be dispensed via fuel pump into site vehicles, Section 7 AS1940 – 2004 provides details on the requirements for dispensing. Fuel delivery requirements must be in line with Section 8 AS1940. The site must develop a maintenance program to ensure that the tank and dispensing equipment is in good working condition. Details on the maintenance requirements are provided in Section 9.8 AS1940 – 2004.

The diesel tank needs to be 5m from an onsite protected place and the diameter of the tank or 7.5m, whichever is less, but at least 3m from any other chemical storage areas and/or LPG storage.

Due to the volume of Diesel being stored being above 10,000L, the storage tank must comply with placard requirements and signage (see **Section 8.6**).

Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids. Precautions include covering the tank preventing direct sunlight hitting the tank, having the provision of a water supply that can cool the tank down. Excluding all ignition sources within 3m and not issuing any hot works permits (within 3m of the tank) during days that are above 40°C.

## 8.3 Fire Prevention Strategies

In addition to the above, the following fire prevention strategies will be implemented in order to minimise the likelihood of a fire and/or reduce a fire's sensitivity or extent:

- The buildings have been designed and will be installed compliant with the requirements of the Building Code of Australia (BCA).
- Electrical installations will be installed and maintained compliant with relevant Australian Standards, including AS 3000:2007 - Electrical Wiring Rules.
- Fire extinguishers and hose reels will be installed at designated locations compliant with relevant Australian Standards (refer **Section 9**).
- Appropriate warning/identification signs will be installed for fuels and fire protection equipment.
- Diesel tanks will meet relevant Australian standard requirements.
- Diesel fuel tank bund design will include minimum capacities for the applicable storage size of the fuel tank(s).
- The diesel and LPG storage (i.e. dissimilar fuels) will be separated from each other by greater distances than specified in **Table 8**.
- Required maintenance and testing will be undertaken for all relevant equipment.
- General housekeeping procedures will be regularly undertaken and the areas are kept clear of any combustible materials.
- Site-specific training for employees and contractors in the use of fire extinguishing/protection equipment.

## 8.4 Small quantities of chemicals

Some small quantities of chemicals associated with minor maintenance requirements may be stored on site. These chemicals will be stored in a designated dangerous goods storage area not exceeding 250L. The cabinet will be located in close proximity to where the maintenance work is undertaken. The cabinet will be located at a greater distance from LPG and diesel than those specified in Table 7 and will have no ignition sources within 3m.

## 8.5 Emergency Planning

The Emergency Plan should be designed to cover fire emergencies and aim to:

- Enable a quick and efficient response to any emergency or pollution incident to limit the potential impacts;
- Support emergency services and regulatory authorities with key information and knowledge; and
- Maintain a high level of preparedness.

The Emergency Plan should contain details on hazards, types and levels of emergency, resources and responsibilities and training and testing requirements.

## 8.6 Signage

### 8.6.1 Outer warning placards

The site must be marked by a HAZCHEM outer warning placard.

These outer warning placards must be displayed at all road entrances to the site where FRNSW may gain entry. Usually this will be at the main road entrance.

A HAZCHEM outer warning placard for dangerous goods (**Diagram 1**) must:

- a. be at least 120 mm high; and
- b. display the word 'HAZCHEM' as shown below:
  - I. in red capital letters at least 100 mm high; and
  - II. in lettering of the kind shown below; and
  - III. on a white or silver background.



Diagram 1 Template HAZCHEM Sign

### 8.6.2 Packaged dangerous goods

Placards must be displayed on or near the storage location of bulk dangerous goods (the Diesel Tank).

1. A placard for bulk dangerous goods (**Diagrams 2 and 3**) must:
  - a. have dimensions not less than the dimensions shown in **Diagram 2**; and

- b. show the following details for the goods in the following positions on the placard:
  - I. in position (a) — the proper shipping name;
  - II. in position (b) — the UN number;
  - III. in position (c) — the Hazchem code;
  - IV. in position (d) — the class label and the subsidiary risk label (if any).
2. The numbers and letters used for the proper shipping name, UN number and Hazchem code must be:
  - a. black on a white background; and
  - b. if the proper shipping name takes no more than 1 line — at least 100 mm high; and
  - c. if the proper shipping name takes 2 lines or more — at least 50 mm high.
3. Despite paragraph (2) (a), a letter of the Hazchem code may be white on a black background.
4. The class label must:
  - a. comply with the form and colouring specified in Chapter 7 of the ADG Code; and
  - b. if there is also a subsidiary risk label — have sides of at least 200 mm; and
  - c. if there is no subsidiary risk label — have sides of at least 250 mm.
5. A subsidiary risk label must:
  - a. comply with the form and colouring specified in Chapter 7 of the ADG Code; and
  - b. have sides of at least 150 mm.

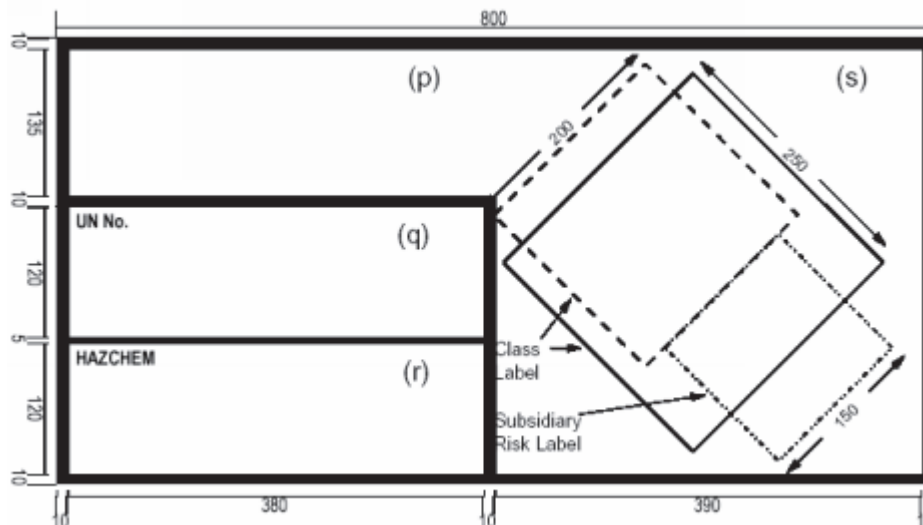


Diagram 2 Template of a placard for bulk dangerous goods



**Diagram 3 Example a placard for bulk dangerous goods**

The class label (including mixed class labels) should be grouped. Grouping need not be in a horizontal line — it can be vertical or diagonal. If there is regular variation in the type of dangerous goods, it may be convenient to use frames for slip-in-and-out labels, such as the type commonly used on vehicles. Vehicles and loads marked in accordance with the ADG Code placards are acceptable.

A placard for packaged dangerous goods must:

- a. display the class label for each of the dangerous goods to which the placard relates; and
- b. Comply with the form and colouring specified in Chapter 7 of the ADG Code (See AS1216).

Each class label must have sides of at least 100 mm.

## **9 DETAILS OF DETECTION AND PROTECTION**

### **9.1 Fire Detection Systems**

A smoke detection system in accordance with Clause 4 of Specification E2.2a (BCA) is required. The smoke detection system must comply with AS1670.1 and would activate the occupant warning system.

A building occupant warning system complying with Clause 6 of Specification E2.2a (BCA) is required for buildings with a sprinkler system. The occupant warning system should not only alarm in the shed where detected but should be designed to alert occupants in the office that there is an issue. This will then allow the office staff to action the emergency plan. If the alarm is activated in shed B or C then it should also alarm in Shed A and the site office.

### **9.2 Protection and firefighting LPG**

The location and construction of the storage area for LPG needs to comply with the requirements of AS/NZS1596:2014. In summary the following needs consideration:

- Cylinders shall not be stored in direct sunlight
- Cylinders shall be protected against impacts from vehicle movements
- The storage area shall be level hard standing (concrete) and free draining of water
- There shall be no combustible material within 3m of the storage area
- Cylinders shall be secured while stored

- Cylinders shall be protected from tampering
- If storage is adjacent to a building Cylinders shall be at least 1m from any opening (window or door) air intake, ventilation point etc.
- Hazardous areas shall comply with AS/NZS 1596:2014 (0.5m laterally and vertically above the top of the cylinder down to 1.5m from the base of the cylinder).

Section 13.4.1 and Table 13.1 AS/NZS 1596:2014 indicate that there are no specific requirements for the storage of cylinders of this volume outside.

Additional precautions could involve being able to spray cylinders with water

### **9.3 Protection and firefighting Diesel**

Fire protection systems shall be appropriate to the hazard and include consideration of adjoining activities and materials, so as not only to deal with incidents within the storage but also to reduce the potential for the liquids to become involved through the escalation of another incident.

In accordance with the requirements of Section 11.11.3 AS1940 – 2004 any outdoor tank storage shall be provided with fire protection in accordance with:

*(b) Where Class C1 liquid is stored without flammable liquid, but with or without Class C2 liquid, at least one powder-type extinguisher shall be provided if a single tank installation.*

The powder type fire extinguisher will have a rating of at least 2A 60B(E) (AS/NZS 1841.5) and a capacity of 9kg. The extinguisher shall be located within 10 m of the tank and shall be positioned outside of any bund.

The requirements for dispensing are the same as above with the location being chosen to optimise access in an emergency.

Fire protection equipment shall be maintained in accordance with Section 11.3.10 AS1940:2004 or the specific standards that applies to that equipment.

### **9.4 Requirements for Fire Protection Systems**

#### **9.4.1 Fire Hydrant System**

Section E1.3 Fire Hydrants national building code volume one 2015 requires a fire hydrant system to be installed to serve a building having a total floor area greater than 500m<sup>2</sup> and where a fire brigade is available to attend a building fire.

For this site there is currently a hydrant booster system located adjacent to the eastern entrance of the site. This will remain in place as part of the development. In addition to the booster there are two existing hydrants located on the eastern boundary. These will remain in place as part of the development.

These hydrants are considered adequate to satisfy the requirements of Section E1.3 National Building Code.

#### **9.4.2 Fire hose reel system**

Section E1.4 Fire hose reels national building code volume one 2015 requires a fire hose reel system to be provided to serve the whole building where one or more internal fire hydrants are installed or where internal fire hydrants are not installed, to serve any fire compartment with a floor area greater than 500 m<sup>2</sup>.

The site currently has a Fire Hose Reel located in Shed A. This is considered adequate to serve this building. There is currently one Fire hose Reel located at the northern end of Shed C, two additional Fire Hose reels are required to adequately serve this building (total of three Fire Hose Reels for sheds B & C).

#### **9.4.3 Sprinkler system**

Section E1.5 national building code volume one 2015 requires a sprinkler system to be installed for occupancies of excessive hazards. Note 3 of Table E1.5 describes occupancies of excessive fire hazard comprise buildings which contain (b) combustible goods with an aggregate volume exceeding 1,000m<sup>3</sup> and stored to a height greater than 4m. As identified in **Table 9**, 1,000 tonnes of potentially combustible material will be held on site at any one time. It is understood that this will be split 50/50 between the processing sheds B and C and the storage Shed A. Therefore it is likely that less than 1000m<sup>3</sup> of combustible material will be stored in each area at anyone time.

Historically FRNSW have expressed concerns with the difficulty to fight fires in such facilities as this. In order to address these concerns, take into consideration a “worst case scenario” and meet the requirements of Clause E1.10, a fire sprinkler system is recommended to be installed in all three sheds.

### **9.5 Design recommendations for Fire Protection Systems**

#### **9.5.1 Fire Hydrant System**

The fire hydrant system must meet the requirements of AS2419.1 – 2005. The following requirements provide a summary of the hydrant system requirements for this site:

- The hydrant system should be located external to the building.
- A fire brigade booster assembly will be required
- The water flow velocity in pipework shall not exceed 4m/s
- Minimum required flow rate is 10 L/s
- Minimum residual pressure of 250 kPa for attack hydrants, 150kPa for feed hydrants and 700kPa when boosted by a fire brigade pumping appliance.
- The number of fire hydrant outlets required to flow simultaneously is 2 (Table 2.1 AS2419.1 – 2005).
- Hydrants shall be above ground, have two outlets each and be individually valve controlled

The location of the current fire hydrants and the booster hydrant is considered appropriate for the site.

#### **9.5.2 Fire hose reel system**

The hose reel system will comply with the requirements of AS2441 – 2005.

This site is considered to be a “High Hazard” class where the class of hazard wherein the amount and type of combustibles present are such that fires of large initial size may be expected.

The size of hose should be 25mm and have a minimum discharge capacity of 0.41 L/s at 220 ±10 kPa inlet pressure. The supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver the minimum demand specified for the two most hydraulically disadvantaged fire hose reels operating simultaneously.

Each fire hose reel shall be located in a readily accessible position, in accordance with the requirements of the BCA. Fire hose reels shall not be located in positions where access could present a hazard to the potential user. Access to fire hose reels shall not be obstructed, e.g., from items such as furniture.

Where a fire hose reel is installed in an external situation or an aggressive environment (Exterior situations exposed to the sun, ultraviolet radiation, wind, rain or salt spray, abnormally dusty or moisture-laden atmospheres and environments that subject the hose reels to continuous or intense vibrations), it shall be protected by a cabinet or other suitable means. This will need to be considered in more detail as part of the final design for this development.

Access to fire hose reels shall not be obstructed, e.g., parked vehicles or unprocessed stockpiles.

The maximum coverage for a fire hose reel shall comply with the following requirements:

- a. All points on a floor shall be within reach of a 4 m hose stream issuing from a nozzle at the end of the hose laid on floor. The hose length shall not exceed 36 m.
- b. The distance from a hose reel to the nominated point shall be taken as the most direct laid-on-ground or floor route.
- c. The location of internal walls, partitions, doorways, storage racking, and any other fixed obstructions, which would restrict normal hose coverage throughout the building or area to be protected, shall be considered when determining the number and location of fire hose reels.

It is recommended that 2 additional hose reels be installed based on the distance requirements above. Each fire hose reel shall be located as identified in **Figure 5**.

Fire hose reels are not required for the office, lunch room or amenities.

### 9.5.3 Sprinkler system

The design and installation of the sprinkler system will comply with the requirements of AS 2118.

For the purpose of this study some assumptions have been made to develop an appropriate worst cases design scenario.

Based on the information available the hazard class of occupancy has been taken to be a **High Hazard Occupancy**. It is noted that a waste processing facility does not fit any occupancy descriptions presented in Appendix A of AS 2118.1, therefore a best fit solution has been selected.

Based on the criteria provided in Section 11 AS 2118.1 a 3m x 3m spacing of sprinklers (= 9m<sup>2</sup> coverage by each sprinkler) has been selected for this study.

**Table 11 Required sprinklers and extinguishers**

Shed	A	B & C
Area m <sup>2</sup>	930	2111
Floor area (m x m)	26 x 37	109 x 25
No. Sprinkler heads	108	296
No. Fire extinguishers	2 x 6A (1 x 10A)	4 x 6A (3 x 10A)

Additional consideration can also be given to the requirements of AS2118.3 and AS2118.6 depending on detailed design constraints and availability of water from the town supply.

A sprinkler system is not required for the office.

#### 9.5.4 Fire extinguishers

1 x 2A 60B(E) 9kg powder type fire extinguisher located adjacent to the diesel tank

Main processing shed is capable of Class A Fires involving carbonaceous solids, such as wood, cloth, paper, rubber and plastics. As previously identified this site is considered to be a "High Hazard" class where the class of hazard wherein the amount and type of combustibles present are such that fires of large initial size may be expected.

In accordance with Table 4.1 AS2444 – 2001, the required number of fire extinguishers are presented in **Table 11** for Shed A and Sheds B & C.

A 2A 60B(E) powder type fire extinguishers should also be located in the office building.

A 2A water fire extinguisher should be located in the amenities block

The following should be located in the lunchroom:

- 2A 60B(E) powder type fire extinguisher, and
- A fire blanket in the kitchen/lunchroom

## 10 DETAILED DRAWINGS OF FIRE SERVICES LAYOUT

This section will be completed once the final detailed service design layout has been completed by a hydraulic engineer. Hand marked drawings are provided to provide an indication of the proposed layout (**Figure 5**). The sprinkler design is presented in **Figures 6a and 6b**.

## 11 FIREFIGHTING WATER DEMAND AND SUPPLY

### 11.1 Water demand calculations

The capacity of the source water for fire hydrant installations shall not be less than 2 x 10 L/s for a duration of not less than 4 hours (**20 L/s x four hours = 288,000 L**).

The supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver a demand of 0.41L/s for a 25mm hose (Section 6.1 AS2441), for the two most hydraulically disadvantaged fire hose reels operating simultaneously, plus any probable simultaneous flow. (**0.41L/s x 2 x 4 hours = 11,808L**)

Full water demand calculations will need to be undertaken as part of the detailed hydraulic design. For the purpose of this study sprinkler hydraulic characteristics have been calculated using Table 6.3 AS2118.1. Assuming a K factor of 10 (for a standard sprinkler) and minimum pressure of 50kPa the required flow rate for each sprinkler would be 70 L/min. For 296 sprinklers all running at the same time this would require a demand of **20,720 L/min**.

To meet a worst case scenario all water demands must be capable of running at the same time. Therefore, there must be **1.3mega litres** of water available per hour.

### 11.2 Water Supply

Water supply will be from the local town water supplier through mains water. Confirmation (in writing) is required from the local town water supplier detailing they can provide this volume of water in an emergency.

Should the town supply not be sufficient to support the requirements above then additional source requirements will need to be made.

## 12 CONTAINMENT OF FIREFIGHTING WATER

The proposed stormwater management plan for the site is shown in **Figure 7a and 7b**. The plan details the drainage system for the site and a filtration system to clean storm water before it is released. The drainage system has been designed to include a gate valve to the stormwater pipe where it exits the site. In the event of a fire and the requirement to manage firefighting water, the gate valve can be closed allowing the water to be appropriately managed to prevent offsite contamination.

Consideration has been given to the containment of fire water along the western boundary and preventing any runoff entering directly into the Bow Bowing Canal. The site drains to the east and therefore is unlikely to present a risk to the canal from fire water runoff.

## 13 EMERGENCY MANAGEMENT

As part of the site commissioning the current emergency and pollution incident response management plan will be reviewed and amended by the site.

In the event of a fire emergency, the emergency services must be contacted immediately by telephoning "000" if the incident presents an immediate threat to human health or property.

### 13.1 Emergency Equipment

**Table 12** lists the key safety equipment to be maintained at the Development Site.

**Table 12 Key Safety Equipment**

Item	Location(s)	Maintenance Requirement
Hose reels	Designated locations compliant with relevant AS	Maintenance and testing every 6 months (or as required by Australian Standard)
Sprinkler system		
Fire hydrants		
Fire extinguishers	Adjacent to diesel tank Adjacent to LPG storage area Office building.	
SDSs	Chemical storage area and Site Office	Checked for currency every 12 months
First Aid Kits	Site Office	Checked for currency every 12 months
Spill Kits	Chemical storage areas and diesel tank	Checked for currency and compatibility every 2 years
Personal Protective Equipment (PPE)	Site Office	As required and needed

**Diagram 4** illustrates the various types of fire extinguishers.

Type of extinguisher		Type of Fire, Class and Suitability							Comments (Refer Appendix B)
		A	B	C	E	F	D**		
Colour scheme	Extinguishant	Wood, paper, plastics, etc	Flammable liquids	Flammable gases	Energized electrical equipment	Cooking oils and fats	Metal fires		
AS/NZS1841-1997 AS1841-1992									
	Water							Dangerous if used on flammable liquid, energized electrical equipment and cooking oil/fat fires	
	Wet Chemical							Dangerous if used on energized electrical equipment	
	Foam***					LIMITED*		Dangerous if used on energized electrical equipment.	
	Powder	ABE						Special powders are available specifically for various types of metal fires (see **).	
		BE							
	Carbon Dioxide	LIMITED*	LIMITED*					Generally not suitable for outdoor use. Suitable only for small fires.	
	Vaporizing Liquid		LIMITED*	LIMITED*				Check the characteristics of the specific extinguishant.	
	Fire Blanket								

\* Limited indicates that the extinguishant is not the agent of choice for the class of fire, but that it will have a limited extinguishing capability.  
 \*\* Class D fires (involving combustible metals). Use only special purpose extinguishers and seek expert advice.  
 \*\*\* Solvents which may mix with water, e.g. alcohol and acetone, are known as polar solvents and require special foam. These solvents break down conventional AFFF.

Diagram 4 Types of Fire Extinguishers (AS 2444 – 2001)

Suggested locations of firefighting equipment at the site have been presented in **Figure 6**. Final locations will be determined subject to certification requirements.

### 13.2 Emergency Control Centre

The Site Office can act as an Emergency Control Centre if required. An *Emergency Resource Pack* containing up-to-date copies of the following information will be maintained at the Site Office as a resource to Site Management, the Site Warden and emergency service personnel as required:

- The quantity and location of LPG being stored
- The quantity and location of Diesel being stored
- The *Emergency Plan*, including the upfront *Emergency Services Information Package*.
- A separate one pager containing the site and regulatory authority contact details; and
- A manifest (e.g. ChemAlert printout) of chemicals and quantities being stored. The SDS for all chemicals and fuel on site (including a plan of where the chemicals are being stored).

NOTE: in the event of Shed A being on fire it is unlikely that the site office could be used as an emergency control centre. In this instant additional requirements will need to be made offsite.

### 13.3 Training and Testing

Site Management will ensure that all employees and contractors are suitably inducted and trained prior to commencing any work on site.

Details of emergency training requirements will be contained in the *Emergency Plan*.

### 13.4 Emergency Plan Testing and Review

The *Emergency Plan* for the Development will be reviewed and tested every 12 months as per the requirements of the POEO(G) Regulation. Testing will include various emergency scenarios including fire.

## 14 RECOMMENDED WORKS

SLR has made the following recommendations following the completion of this study:

**Table 13 Recommended works**

Work No.	Recommendation	Required by date
1	Confirm the fire hydrant design and water capacity meets the requirements of this report Confirm the current fire hose reels meets the requirements of this report	Finalisation of detailed design
2	Meet with the local brigade to discuss their requirements and needs for incorporation into the detailed design.	Finalisation of detailed design
3	Complete the Fire Hose Reel design	Finalisation of detailed design
4	Confirm in writing that the local town supply will cope with the water requirements	Finalisation of detailed design
5	Develop the fire hose reel and fire extinguisher protection requirements	Finalisation of detailed design
6	Update the current emergency plan	As part of the site commissioning
7	Provide confirmation/certification/letter of compliance that the Diesel tank has been installed in accordance with AS1940 and that separation distances are appropriate.	As part of the site commissioning

## 15 REFERENCES

APP (2016) *Minto Resource Recovery Facility Environmental Impact Statement*

AS 1940 – 2004, The storage and handling of flammable and combustible liquids

AS/NZS 1596: 2004, The storage and handling of LP Gas

AS 2118.1 – 2006 Automatic fire sprinkler systems Part 1: General systems

AS 2419.1 – 2005, Fire hydrant installations; Part 1: System design, installation and commissioning

AS 2441 – 2005, Installation of fire hose reels

AS 2444 – 2001 Portable fire extinguishers and fire blankets – Selection and location

Barker Ryan Stewart (2016) *Storm water concept plan*

Insight Architectural Plans (2016) *Minto Resource Recovery Facility*

NCC 2015 Building Code of Australia – Volume One

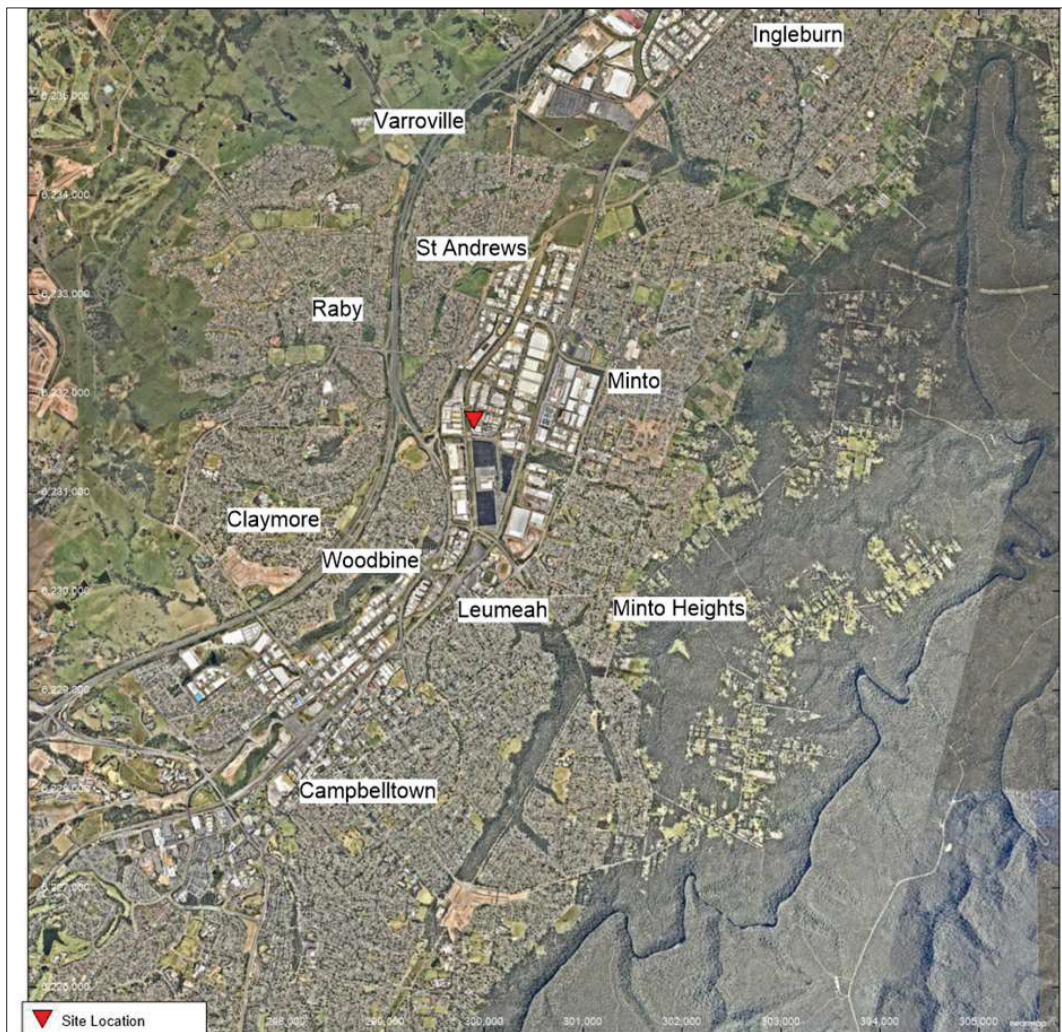
SLR Consulting Australia (2015) *Soil and water assessment*

SLR Consulting Australia (2016) *Preliminary risk screening and hazard assessment*

**Appendix A**

Report Number 610.14692.00521-R01

FIGURES



**LEGEND**

Bingo Group  
 Resource Recovery Facility - Minto  
 Air Quality Impact Assessment



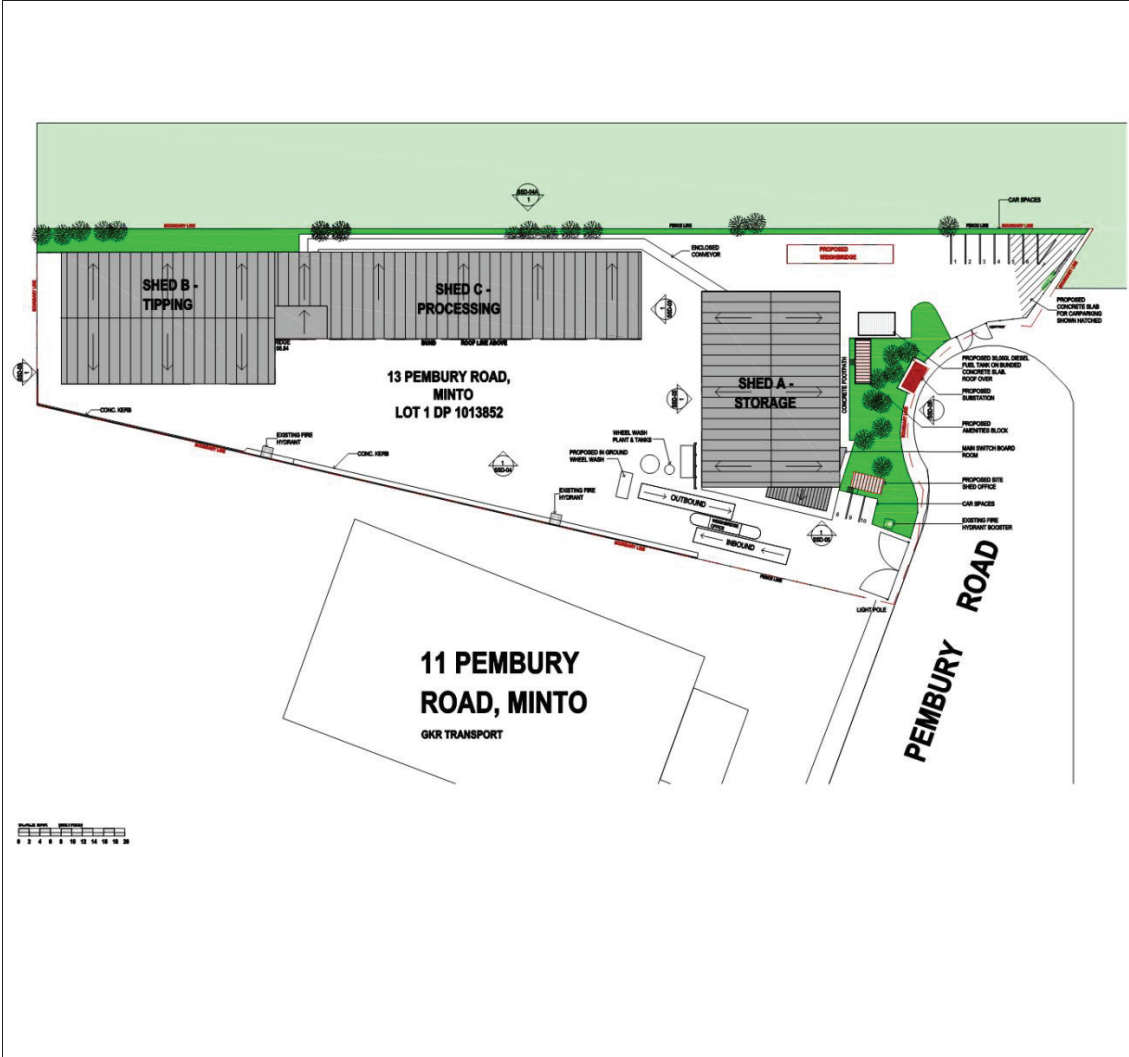
Regional Setting

**NOTES**



10 Kings Road,  
 New Lambton,  
 NSW 2305  
 Australia  
 T: +61 2 4037 3200  
[Newcastle@slrconsulting.com](mailto:Newcastle@slrconsulting.com)  
[www.slrconsulting.com](http://www.slrconsulting.com)

Fire Safety Study  
 Resource Recovery Facility  
 Minto  
 Figure 1  
 Site Location Plan  
 610.14692.00521



**DEWCAPE**  
 10 Kings Road, New Lambton, NSW 2305, Australia  
 T: +61 2 4037 3200  
[Newcastle@slrconsulting.com](mailto:Newcastle@slrconsulting.com)  
[www.slrconsulting.com](http://www.slrconsulting.com)

**LEGEND**

**NOTES**

**General Notes**  
 The holder shall check all dimensions and levels on site prior to construction. Notify any errors, discrepancies or omissions to the architect. Drawings shall not be used for construction purposes until issued for construction. Do not scale drawings. All boundaries and contours subject to survey.

**Client**  
 Giffels Properties Pty Ltd.

**Project Name**  
 MINTO SSD

**Drawing Title**  
**ROOF PLAN**

Scale: 1:200 @ A4 Date: 04/11/2016  
 Status: SSD Drawn By: BC  
 Paper: A0 Checked By: BC  
 Project No.: M11004  
 Drawing No.: SSD-2B1C  
 Rev: 01

**SLR**

10 Kings Road,  
 New Lambton,  
 NSW 2305  
 Australia  
 T: +61 2 4037 3200  
[Newcastle@slrconsulting.com](mailto:Newcastle@slrconsulting.com)  
[www.slrconsulting.com](http://www.slrconsulting.com)

**Fire Safety Study**

**Resource Recovery Facility**  
 Minto

**Figure 2**

**Site Plan**

610.14692.00521

LEGEND

NOTES



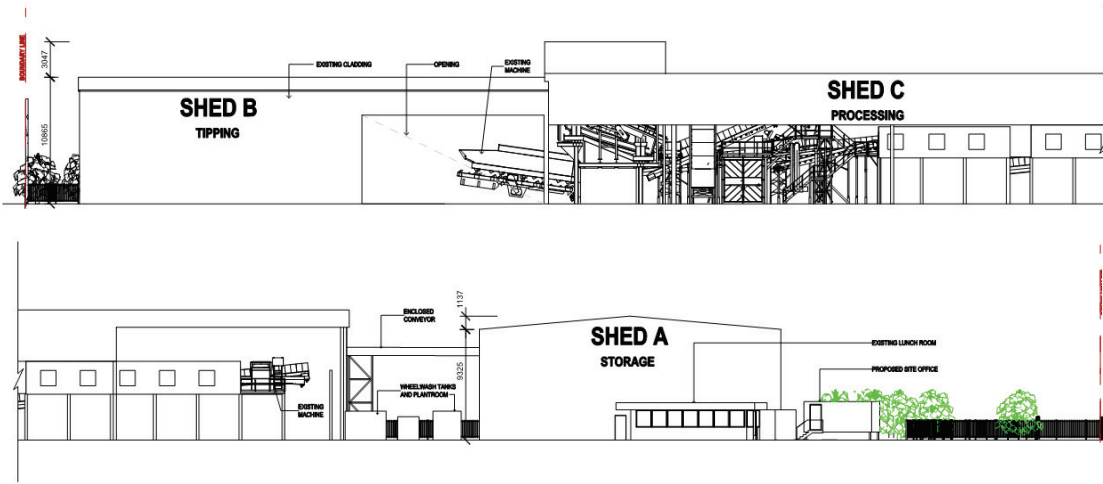
10 Kings Road,  
New Lambton,  
NSW 2305  
Australia  
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[www.slrconsulting.com](http://www.slrconsulting.com)

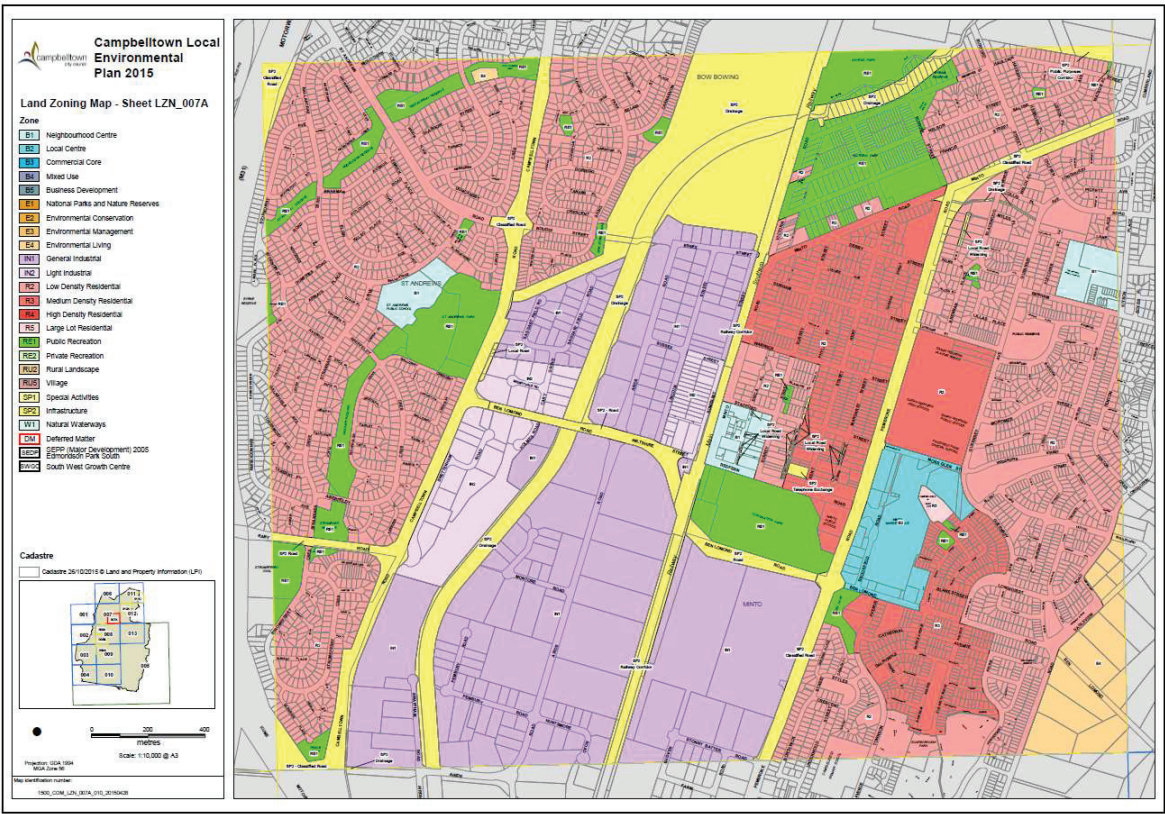
Fire Safety Study

Resource Recovery Facility  
Minto

Figure 3

Building Height  
610.14692.00521





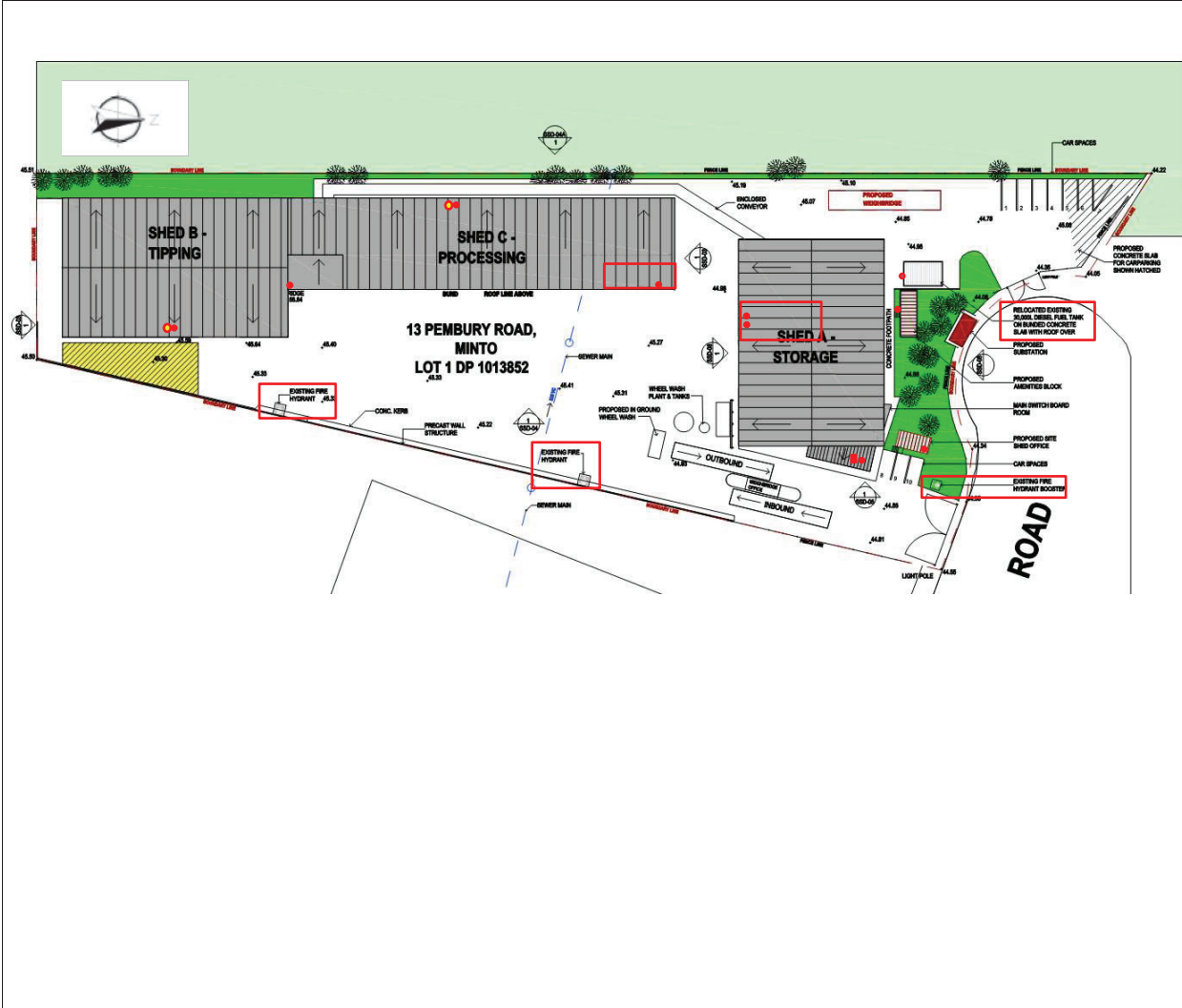
**LEGEND**

**NOTES**

**SLR** 

10 Kings Road,  
New Lambton,  
NSW 2305  
Australia  
T: +61 2 4037 3200  
[Newcastle@slrconsulting.com](mailto:Newcastle@slrconsulting.com)  
[www.slrconsulting.com](http://www.slrconsulting.com)

Fire Safety Study  
Resource Recovery Facility  
Minto  
Figure 4  
Surrounding Land Use  
610.14692.00521



**LEGEND**

- Fire Hose Reel
- 6A (or 2A) Fire Extinguisher
- 2A 60B(E) 9kg Powder-Type Fire Extinguisher
- Fire Blanket

**NOTES**

RELOCATED EXISTING 2000 LITRE DIESEL FUEL TANK ON BANKED CONCRETE SLAB WITH ROOF OVER

PROPOSED SUBSTATION

PROPOSED AMENITIES BLOCK

MAIN SWITCH BOARD ROOM

PROPOSED SITE SHED OFFICE

CAR SPACES

EXISTING FIRE HYDRANT SOCKET

**SLR** 

10 Kings Road,  
New Lambton,  
NSW 2305  
Australia  
T: +61 2 4037 3200  
[Newcastle@slrconsulting.com](mailto:Newcastle@slrconsulting.com)  
[www.slrconsulting.com](http://www.slrconsulting.com)

Fire Safety Study  
Resource Recovery Facility  
Minto  
Figure 5  
Fire Equipment Layout  
610.14692.00521



Figure 6b

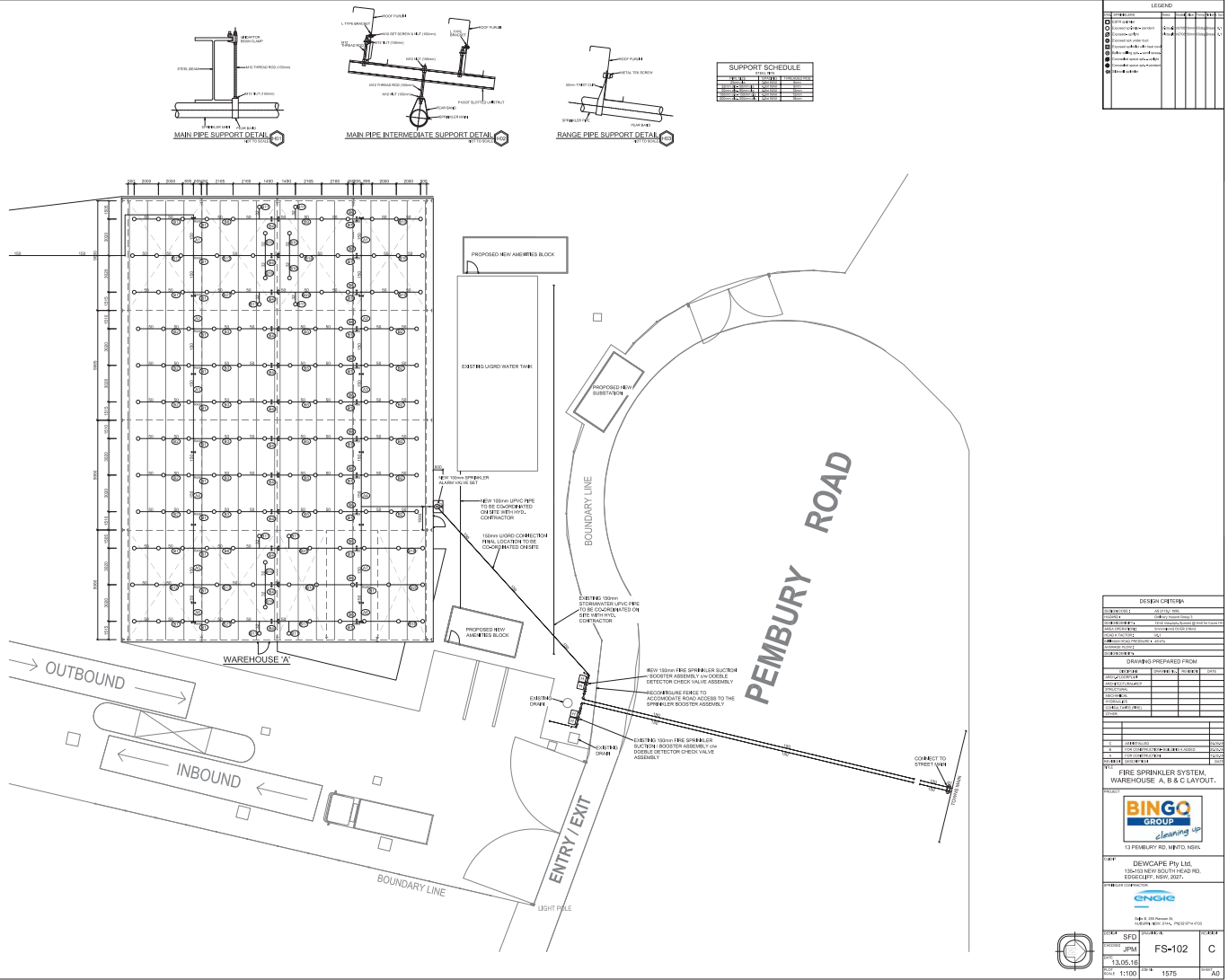
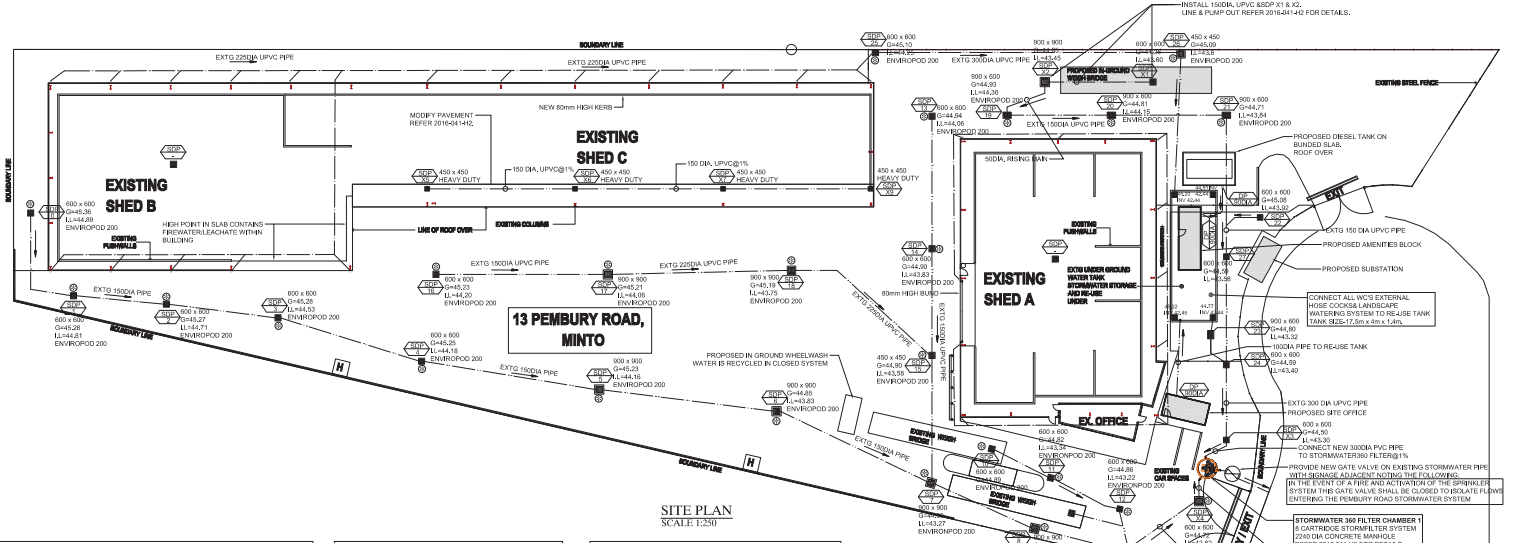
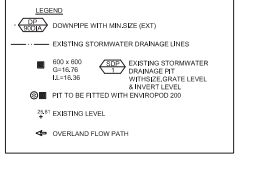


Figure 7a

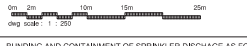


- SCOPE OF WORK:**
1. INSTALL ENVIPOD TO STORMWATER PITS AS MARKED
  2. INSTALL DPs TO NEW TOILET BLOCKS
  3. REPLUMB WATER TANK TO WC'S LANDSCAPE AREAS & EXTERNAL HOSE COCKS.
  4. PLACE FILTER CHAMBER 1 BY STORMWATER 360 & ASSOCIATED PITS SDP X3 & X4 AND PIPEWORK UPSTREAM OF EXISTING HUMCEPTOR.
  5. MODIFY PAVEMENT IN SHED C IN ACCORDANCE WITH DETAIL ON 2016-041-H2.
  6. CLEAN ALL EXISTING STORMWATER PIPES & PITS AND VERIFY ALL PITS & PIPES ARE IN GOOD WORKING ORDER.



**NOTES:**

ALL STORMWATER DRAINAGE TO BE SEWER GRADE P.V.C. UNLESS OTHERWISE NOTED. ALL STORMWATER DRAINAGE TO BE 100 DIA. @ 1% MIN GRADE.



**BUNDING AND CONTAINMENT OF SPRINKLER DISCHARGE AS FOLLOWS:**

**SHED A**  
 MAXIMUM SPRINKLER DISCHARGE = 25,600 LITRES  
 FLOOR AREA = 629 m<sup>2</sup> x 0,08 m (BUND HEIGHT) = 74,000 LITRES

**SHED B & C**  
 MAXIMUM SPRINKLER DISCHARGE = 59,800 LITRES  
 FLOOR AREA = 2111 m<sup>2</sup> x 0,08 m (BUND HEIGHT) = 168,000 LITRES

**STORMWATER NOTES.**

1. All pipes and stormwater structures shall be in strict accordance with relevant S.A. Codes for materials, workmanship and to rules and regulations of the local Council.
2. The drawings are diagrammatic and setbacks shall be checked with the local Council.
3. All levels and dimensions shall be checked on site prior to start of construction.
4. Pipe materials indicated may be different provided they comply with the requirements of the relevant authorities.
5. Gutter and downpipes shall be in strict accordance with AS1708/AS1718. Gutters shall have a minimum effective cross sectional area of 600mm<sup>2</sup> (125/200 GUTTER) or similar with 100 dia. downpipe unless otherwise noted on site.
6. Stormwater pipes up to and including 300 dia. shall be PVC pipe sewer grade conforming to AS1910 and installed in accordance with AS2003 and related standards.
7. All existing manholes to be located prior to the commencement of construction. Any alterations or minor relocation of services to be done by the applicant.
8. Provide unrestricted overland flowpaths from all pits and drain to detention tank after gages.
9. On-site stormwater detention reduces flooding by providing temporary storage of stormwater during storms. After the storm the stored water is slowly released normally through a control orifice. Systems incorporating a high bank Discharge Rate (HBR) section, then overflow into the storage and are not overtopped through a control orifice. High bank Discharge Rate systems are not suitable for detention systems. All storage systems will equally fit but have several hours to empty. Detention during the period will not affect most grass plants or trees.
10. Councils require that on-site detention systems be inspected during construction to enable a Final Hydraulic Certificate and Work as Executed details to be supplied upon completion. Councils require that concrete works (bank bases, HAs, retaining walls etc) are inspected before pouring and a Structural Engineers Certificate is issued on completion.
11. These details are subject to approval by Council and possibly other authorities. Do not continue or commit to any works until these details are approved. Advise Design Engineer of any special conditions imposed or design variations made to the details. Any alterations (however minor) must be authorised by the Design Engineer.
12. Conditions found during construction that conflict with those specified shall be reported to the Design Engineer. In doubt, ask. Design sizes, levels, heights and depths must not be varied without approval.
13. All works are to be completed before the Final Certificate will be issued. Tanks are to be clear of all formwork, builder's rubbish and soil. The order and timing of the works shall be agreed with the Council. The order and timing of the works shall be agreed with the Council. The order and timing of the works shall be agreed with the Council.
14. Maintenance of the on-site stormwater detention system is the responsibility of the Owner. A copy of these details shall be provided to the present owner. The details shall be passed on to subsequent owners. It is important that these systems are not modified without approval. Do not enter any pit or tank when there is a risk of inadequate ventilation or buildup of noxious odours, gases, or leakage of any volatile or toxic contaminants into the chamber. Obtain professional assistance if any of these conditions occur.
15. Maintenance and clearing is required on Rainwater, Runoff and Run-off from the trap screen. These catch tank bases and remove accumulated debris. Both the discharge pipe. This must be done to Council's time requirements and as per Council's copy in the responsibility of the Owner to find out Council's requirements.
16. Orifice plates shall be fabricated from 3mm thick stainless steel with a circular hole machined to 125mm. Plates shall be fixed with four stainless steel expansion or chemical anchors. If required by Council the orifice plate shall also be epoxy fixed, unless otherwise detailed. Plates shall be fixed on the outside of the cage.
17. Screen mesh shall be Lygra's expanded metal type RH200, and shall not be hot dipped galvanized steel fabrications. The screen shall have elongated mesh openings and be installed with the projecting mesh facing down and facing upstream. Screens shall be provided with a suitable knock down on the top upstream face of the screen for removal and, for its screen, to define the screen orientation. All screens shall be removable by hand without the use of tools. Heavy brackets shall be stainless or galvanized steel. Brackets anchors shall be stainless steel. When finished the maximum height shall be 200mm or 2m.
18. Downpipe flow shall be 100% discharge type. Flow shall be located from 100mm, screens and trap screen mesh to the screen trap being removed.
19. Screens shall be 20 MPa for screens and trap bases, and 25 MPa for support and HBR. Mesh reinforcement shall be based on 100mm dia 20mm and reinforcement shall be based on 100mm.
20. Permanent power/cable formwork shall be Lygra's Sunka, any grade or equivalent.
21. Tanks may be built or precast. Note that HBR, screens and the position and depth to orifice plates or discharge control pipes or control both for hydraulic and health reasons. Overflow and control pipes shall be 100mm diameter. Provide the specified number of screens. Provide the specified number of screens. Provide the specified number of screens. Provide the specified number of screens.
22. Tank bases shall be made concrete. Rows shall have the same clear internal size as the tank access openings. Provide step steps to tanks as specified.
23. Retaining walls shall be built on level, and shall have an approved form (gabion wall or high impact concrete) with AS 1557. The tops permanently and securely on the ground and secure. Provide the specified number of screens, equally spaced and with a minimum clearance of 200mm and 200mm, with a minimum of 200mm.
24. Gates and frame seats shall be bronze and be fixed using either a spring loaded ball or a ball and locking system (gates are not permitted). Frames shall be securely attached to the tank or base of the tank.
25. Gates shall be 200mm dia. 20 MPa for gates and frame seats (minimum 200mm) in residential vehicular areas, and 25 MPa for gates and frame seats in public residential.

**PROPOSED ALTERATIONS & ADDITIONS TO EXISTING FACTORY AT 13 PEMBURY RD, MINTO**

Item	Description	Date
I	AMENITIES MOVED, FUEL TANK SHOWN	16.03.2017
H	SUBSTATION RELOCATED, SDP 15 SHED C REMOVED, DIESEL TANK AND SLAB SHOWN	29.07.2017
G	CARTRIDGE STORMFILTER SYSTEM REMOVED	29.07.2017
F	BUNDING CONTAINMENT OF SPRINKLER DISCHARGE CALCULATION ADDED	25.07.2017
E	MINOR CHANGES AS REQUESTED-BUND AREA ADDED, GATE ADDED	29.07.2017
D	NOTES REGARDING SPRINKLER ADDED	11.07.2016
C	FILTER CHAMBER ADDED	23.06.2017
B	WEIGHT BRIDGE RELOCATED	06.06.2017
A	APPROVED FOR CDC	05.06.2017

**BURGESS, ARNOTT & GRAVA PTY LTD**  
 CONSULTING CIVIL, STRUCTURAL & HYDRAULIC ENGINEERS  
 61A THE CENTRE FORESTVILLE P.O. BOX 69 FORESTVILLE 2087  
 Ph: 9603 4411 Fax: 9603 2274  
 email: info@bga-engineering.com.au

**STORMWATER PLAN**

Checked	Scale	Date	Drawing No.
R. GRAVA	AS SHOWN	MAY 2016	2016-041-H1

Approved: \_\_\_\_\_  
 Designer: \_\_\_\_\_  
 Drawing 1 in set of 2  
 Drawing size A1

Figure 7b

