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Dangerous Goods Compliance Report

78 Lockwood Road Data Centre

Prepared for: Stack Infrastructure Pty Ltd

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Abbreviations

Abbreviation	Description
ACOR	ACOR Consultants Pty Ltd
ADG Code	Australian Code for the Transport of Dangerous Goods by Road & Rail
ALARP	As low as reasonably practicable
AS	Australian standard
AS/NZS	Australian/ New Zealand standard
BBU	Battery Backup Unit
DG	Dangerous goods
ERP	Emergency response plan
MHF	Major Hazard Facility
N/A	Not applicable
PG	Packing Group
PPE	Personal protective equipment
SDS	Safety data sheets
SEPP 33	State Environmental Planning Policy No. 33
SFL	Safe Fill Level
UPS	Uninterruptible power supply
WHS	Work Health and Safety

Definitions

Terms	Definition
Category 3 tank	Rectangular tanks and tanks with unconventional shapes, intended principally for industrial use above-ground as either head tanks or storage tanks.
Combustible liquid	Any liquid, other than a flammable liquid, that has a flash point, and has a fire point that is less than its boiling point. For the purpose of this Standard, combustible liquids are divided into two classes as follows: Class C1 - A combustible liquid that has a closed cup flash point of greater than 60°C and no greater than 93°C. (dangerous goods for storage) Class C2 - A combustible liquid that - has a flash point of greater 93°C; or has been excluded from being a flammable liquid by any of the criteria for sustaining combustion. (non-dangerous goods)
Flash point	The lowest temperature, corrected to a barometric pressure of 101.3 kPa, at which application of a test flame causes the vapour of the test portion to ignite under the specified conditions of test.
Ignition source	A source of energy sufficient to ignite a flammable atmosphere. Examples of ignition sources include naked flames, exposed incandescent material, electrical welding arcs, mechanical sparks, and electrical discharge due to static electricity.
On-site protected place	A building where people are employed within the property boundary, including offices, warehouses, manufacturing or processing areas, amenities, and other dangerous goods stores where quantities exceed minor storage.
Off-site protected place	Any of the following, located outside of the bounds of the site: (a) A dwelling, residential building, place of worship, public building, school or college, hospital, theatre, and any building or open area in which persons are accustomed to assemble. (b) A factory, workshop, office, store, warehouse, shop, or building where persons are employed, that is outside the property boundary of the installation. (c) A ship lying at permanent berthing facilities. (d) Any storage facility for dangerous goods outside the property boundary of the installation, except for those defined as minor storages in this or other Standards or regulations.
Public place	Any place other than private property, open to the public, which the public has a right to use, and which includes a public road
Reasonably practicable	That which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including: (a) the likelihood of the hazard or the risk concerned occurring. (b) the degree of harm that might result from the hazard or the risk. (c) what the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk. (d) the availability and suitability of ways to eliminate or minimise the risk. (e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Safe Fill Level	The capacity of the tank up to the maximum safe filling height of the tank as per statutory requirements; AS1940 requires below 95%.
Separation	Keep substances physically apart by distance

Criteria

This review and assessment were carried out based on the following criteria:

1. Legislation:

- Work Health and Safety (WHS) Act 2011
- Work Health and Safety Regulation 2017
- Code Of Practice Managing Risks of Hazardous Chemicals in the Workplace (2019)
- Protection of the Environment Operations Act 1997 (POEO Act).

2. Codes of Practice:

- AS 1940-2017: The storage and handling of flammable and combustible liquids
- AS 4681-2000: Storage and handling of Class 9 (miscellaneous) dangerous goods and articles
- FM Global Insurance Property Loss Prevention Data Sheet 5-32, Data Centres and Related Facilities
- FM Global Insurance Property Loss Prevention Data Sheet 5-33, Electrical Energy Storage Systems
- AS IEC 62619:2023 – Secondary cells and batteries containing alkaline or other non-acid electrolytes
Safety requirements for secondary lithium cells and batteries, for use in industrial applications

Limitations

ACOR has prepared this compliance review on the information provided by LCI Consultants (LCI) in relation to the storage quantities, locations, and design layout at SSDA of the project. It remains the responsibility of LCI and Stack to ensure that the installation meets the requirements, and implement the controls, as required by the relevant legislation.

This report and findings are not a substitute for full compliance with Australian standards and relevant Codes of Practice. LCI / Stack shall ensure that they maintain their duty of care and consult the relevant legislation and guidelines throughout the life of the facility.

All information obtained is provided to LCI for verification and acceptance prior to being published.

Should the storage conditions, or volumes, change, the contents and findings in this report shall be reviewed, and the risks associated with any change assessed and controlled.

Methodology

The methodology for this review was to evaluate the proposed layout, quantities, hazard controls and identify any areas of concern or non-compliance with the Act, Regulations and Australian Standards. The following steps were undertaken:

- An assessment of proposed DG facilities for compliance with relevant standards and codes, with particular focus on risk control measures specified in the Regulations, including:
 - Spill or leak containment
 - Segregation of incompatible dangerous goods
 - Protection from impact
 - Transferring dangerous goods
 - Ignition sources in hazardous areas

- Control of hazardous atmospheres
 - Design, build, maintenance and location of storage or handling systems
 - Containers for bulk dangerous goods
 - Lighting
 - Access and egress
 - Security at a dangerous goods site
 - Control of fire hazards
 - Placards
 - Training
 - Emergency management planning
 - Inventory, manifest and site plan.
- Document and review the hazards associated with non-compliance or other hazards identified.
 - Provide recommendations to address non-compliances.

Note: All information obtained is provided to the client for verification and acceptance prior to being published.

1 Executive Summary

This report addresses the requirements for the SSD SEARs (Secretary's Environmental Assessment Requirements) Industry Specific Cover Letter for the Hazards and Risk section. Following the SEPP Resilience and Hazards Risk Screening Report NA251463-DG-01, this Dangerous Goods Compliance Report has been developed to highlight compliance requirements of the proposed development for the storage and handling of dangerous goods in the facility.

As part of the proposed development, it has been identified that 78 Lockwood Road Data Centre will include storage and handling of the following dangerous goods:

- Diesel (C1 Combustible Liquid); and
- Electrolytes in Lithium-ion Batteries (Class 9 Miscellaneous).

By following the requirements and recommendations documented within this report the 78 Lockwood Road Data Centre will comply with the relevant requirements of:

- AS 1940-2017
- AS 4681-2000
- FM Global Insurance Property Loss Prevention Data Sheet 5-32
- AS IEC 62619:2023

As per the SSD SEARs (Secretary's Environmental Assessment Requirements) Industry Specific Cover Letter Hazard and Risks requirement.

2 Introduction

This Dangerous Goods Compliance Report has been prepared by ACOR on behalf of STACK Infrastructure to accompany a State Significant Development Application (SSDA) for a proposed data centre development at 78 Lockwood Road, Erskine Park (the site).

The site is located in the Penrith Local Government Area (LGA) and is approximately 40km west of the Sydney Central Business District (CBD), 20km west of the Parramatta CBD, and 10km north-east of the future Western Sydney International Airport.

The site is an irregular shaped 7.7-hectare lot bounded to the north by Lenore Drive and to the east by an E2 Environmental Conservation corridor that follows Ropes Creek. The site relies upon access from a cul-de-sac at the eastern end of Lockwood Road at the site's southern boundary. An aerial photograph is provided at Figure 1



Figure 1 Aerial Photograph of Site (Source: Urbis GIS, 2025)

The project comprises the construction of a data centre development including the following key components:

- Site preparation and bulk earthworks.
- Temporary construction access from Lenore Drive.
- Construction of a three-storey data centre comprising two buildings, with a maximum height of 26.5 metres and a total gross floor area (GFA) of approximately 56,506m², including technical data halls, office and administrative areas, and ancillary circulation space.
- At-grade under-croft car parking (34 spaces) within the building footprint, plus an additional 44 on-site spaces, providing a total of 78 parking spaces.

- Separate generator gantry accommodating 188 backup generators.
- Landscaping and associated public domain works.
- Extension and augmentation of physical infrastructure and utilities as required, including an on-site substation and water storage tanks integrated within the building footprints.
- Off-site works comprising the delivery of two 330kV transmission lines from the TransGrid Sydney West Substation site to the subject site, utilising existing road reserve along Lenore Drive.

2.1 Dangerous Goods Background

The data centre is to be split into 2 buildings, each 3 storeys high. Each building will have 16 data house's, 8 UPS battery rooms and dedicated Battery Backup Unit (BBU) battery storage rooms. Each data house is expected to have lithium-ion batteries connected to a circuit, each UPS battery room is expected to have lithium-ion batteries connected to a circuit, and BBU battery storage rooms are expected to store new and/or spent batteries.

Adjacent to the East data centre building, it is proposed 188 containerised diesel generators will form a 4 storey 'stacked' arrangement structure. Each generator set (genset) is to contain a 22,700 L individual double banded tank and 990 L day tank.

The general concept layout can be seen in Figure 2 below.

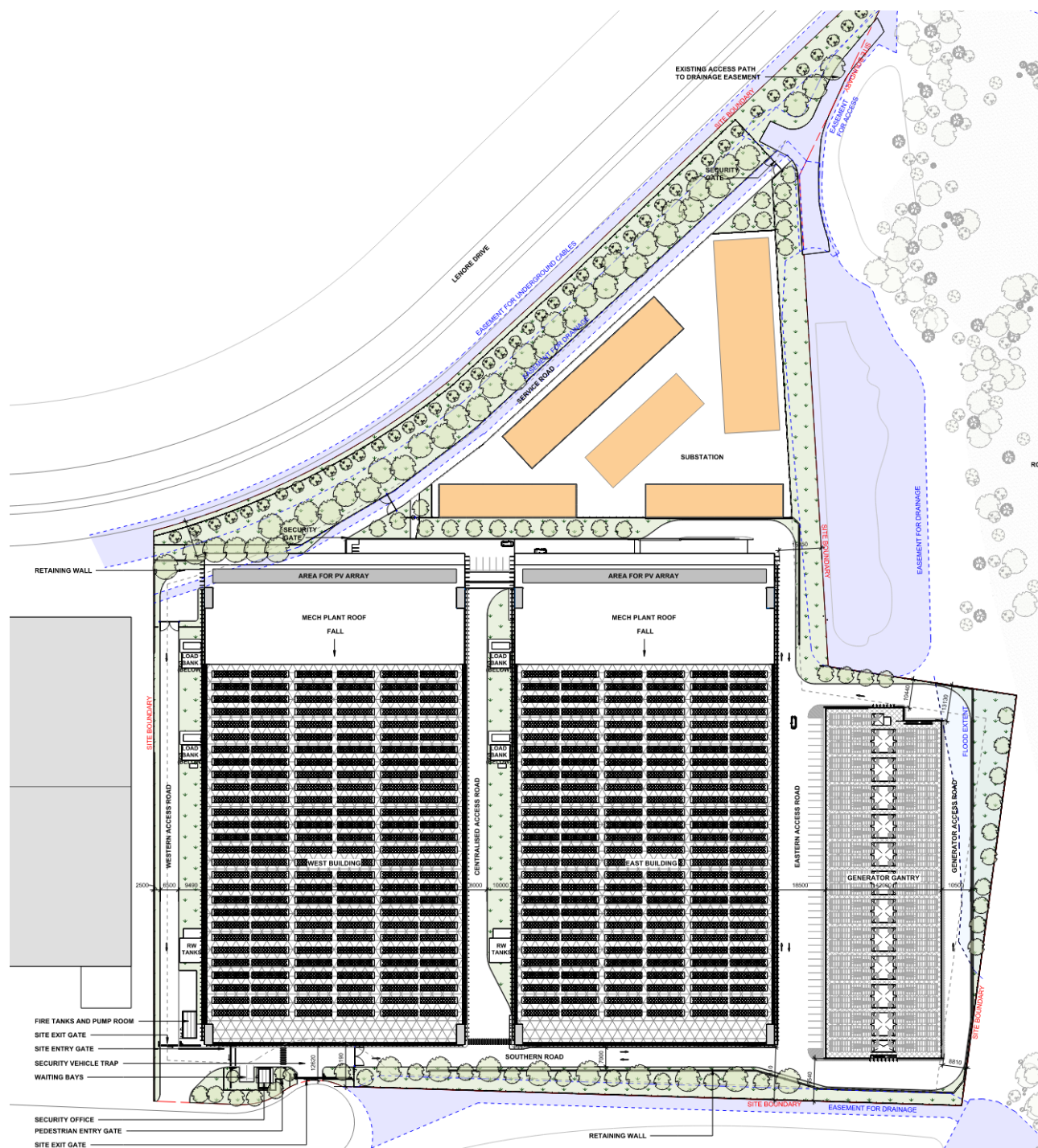


Figure 2. Proposed Layout for 78 Lockwood Road Data Centre

3 Response to SEARS

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 11 April 2025 issued for the SSDA (SSD-82211208). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Table 1 SEARs Compliance

Item	Description of Requirement	Section Reference (this Report)
Hazards and Risks	The EIS must demonstrate the relevant aspects of the FM Global Property Loss Prevention Data Sheet 5-32 – Data Centres and Related Facilities have been considered and could be implemented as part of the development. It must also demonstrate the development would comply with the relevant aspects of the following standards: ▪ AS/NZS 4681 – Storage and handling of Class 9 (miscellaneous) dangerous goods and articles ▪ AS IEC 62619 – Storage cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications ▪ AS 1940 – Storage and handling of flammable and combustible liquids	7

3.1 Objective

The objective of this report is to provide a dangerous goods compliance review of the proposed schematic design of the diesel fuel system and battery storage system located at the 78 Lockwood Road Data Centre, against the defined criteria, identify any non-compliances, and provide recommendations that will assist LCI in complying with the regulatory requirements.

4 Scope

The scope of this report is to provide design guidance for the diesel storage facility and associated lithium-ion batteries in relation to dangerous goods storage and handling. Controls for identified hazards are reviewed, in conjunction with LCI and in line with the requirements of the Regulations and any applicable Codes of Practice. Engineering recommendations are also provided in Section 7.11 to assist LCI with the design.

The scope includes the following areas:

- Diesel Fuel Generator System
 - 188 x 22,700 L individual double banded tanks (1 per genset)
 - 188 x 990 L diesel generator day tanks (1 per genset)
 - 1 x offloading area (with fill cabinets and associated pipework to each genset)
- Lithium-Ion Battery Data House
 - 32 x 3,501 kg Lithium-Ion electrolyte data halls (16 data houses per building)
- Lithium-Ion UPS Battery Room
 - 16 x 672 kg Lithium-Ion electrolyte UPS battery rooms (8 UPS rooms per building)
- Lithium-Ion BBU Battery Storage
 - 2 x 650 kg Lithium-Ion BBU battery storage areas (1 BBU battery storage area per building)
- External Fire Pumphouse
 - 2 x 515 L diesel fire pump tanks

5 Site Assessment

5.1 Basis of the Assessment

- The proposed fuel system specification, given in this report, is based on diesel fuel that has a flash point greater than 60°C but not greater than 93°C and a fire point less than its boiling point. This fuel is classified as a C1 combustible liquid, in accordance with the definition given in AS 1940:2017. Where the tank is to contain any other product, where the product is classified as flammable liquid, the design outlined herein is no longer applicable.
- The 22,700 L tanks are associated with the generator, located in the genset as an individual double bunded tank. These individual double bunded tanks are double walled and self-bunded to capture any leaks.
- The 990 L tanks are also located in the genset and service the generator directly.
- The 515 L diesel fire pump tanks are located away from the generator gantry, at the external fire pumphouse.
- The fuel tanks are classified as Category 3 rectangular tanks as per AS 1940:2017, based on the design, location and intended use.
- The assessment is based on the schematic design of the fuel and battery systems.
- The separation distance and fire risk assessment are based on the generator enclosure as one complete unit due to the location of the tanks - positioned within the generator enclosure.
- Based on the drawings received, listed in the Limitations section, it is assumed that the preliminary specification of the individual double bunded and day tanks are designed to AS 1940 and double walled tanks.
- The generator enclosures will be located externally to the data centre buildings in a stand-alone generator gantry structure, with generators stacked over four stories.
- The generator enclosures are not considered as on-site protected places due to not being occupied during normal operation. Their occupancy by relevant personnel would only be during maintenance and shall have maintenance procedures including safeguards relating to the proximity of the diesel tank.
- Lube oil class (C2) is not considered as dangerous goods and not regulated by SafeWork NSW, thus is not included in this assessment.
- Lithium-ion batteries (Class 9) are present on site.
- The data houses and UPS battery rooms where lithium-ion batteries are in a circuit and considered to be in use, are not considered dangerous goods for storage and handling compliance purposes.
- Additional BBU lithium-ion batteries stored on site as either new or spent batteries in dedicated BBU battery storage rooms are not in use and therefore considered as dangerous goods.

5.2 Facility

78 Lockwood Road Data Centre Diesel Fuel System includes:

1. One hundred and eighty-eight (188) 22,700 L individual double bunded tanks
2. One hundred and eighty-eight (188) 990 L day tanks
3. Two (2) 515 L diesel fire pump tanks

78 Lockwood Road Data Centre includes:

1. Thirty-two (32) 3,501 kg Lithium-Ion electrolyte data houses

2. Sixteen (16) 672 kg Lithium-Ion electrolyte UPS battery rooms
3. Two (2) 650 kg Lithium-Ion electrolyte BBU battery storage areas

The proposed facility design is outlined as follows:

- The fuel supply system for the new data centre is located outside adjacent to the data centre buildings where the individual double bunded tanks and day tanks will be kept in gensets, above ground.
- Fuel is proposed to be transferred from the dedicated individual double bunded tanks to the day tanks via a duty / standby pumping system with corresponding filtration units located within an enclosure on each respective fuel tank.
- Diesel will be supplied via a fuel tanker that is to be parked adjacent to the tank fill points. The access roadway is designed to accommodate a fuel tanker and allow additional vehicles to pass.
- Offloading of fuel to each storage tank is facilitated via fill cabinets with bunding provided, with supply to the generator enclosure via the pumping and filtration cabinet.
- Fuel piping reticulates above via risers to the respective generator enclosure and shall be double-wall UV resistant stainless steel and provided with hydrocarbon leak detection.
- The fuel tank capacities are shown in Table 2.
- As part of the emergency power supply, the facility is also equipped with data halls and UPS battery systems. The facility contains 32 x data halls, and 16 UPS battery rooms consisting of Lithium-ion battery racks. These are split evenly across 2 buildings. In normal operation, the mains supply routes through the UPS but batteries do not discharge.
- In the event that mains supply is lost, the batteries will provide a time-limited power supply to support the data centre until the generators engage and pick up the data centre load. The batteries from both the data halls and UPS battery rooms remain connected in a circuit, charging continuously to be ready for deployment, if required, and are considered to be 'in use' and therefore not a stored dangerous good. Hence, these batteries do not fall into the scope of this assessment. General storage recommendations have been provided throughout the report.
- In an email from LCI on 25/03/2026, information was provided that there will be both new and spent lithium-ion batteries stored in dedicated BBU battery storage rooms. As these batteries (both new and spent) will be stored and not in use, they are considered as dangerous goods. Compliance requirements and recommendations have been provided for multiple storage sizes in this report.
- The Lithium battery layout is outlined in Table 3.

Table 2. Dangerous Goods Storage Locations and Quantities based on the supplied information

No.	Location/Area.	Tank Ref.	Tank Quantity	Chemical	Class / Division	Single Capacity (SFL)	Combined Capacity
1	Stacked Generator	Individual Double Bunded Tank	188	Diesel	C1	22,700 L	4,267,600 L
2	Enclosures	Day Tank	188			990 L	186,120 L
3	External Fire Pumphouse	Diesel Fire Pump Tank	2			515 L	1030 L
Total diesel storage quantity							4,454,750 L

Note: Tank capacity is based on SFL and was provided by LCI Consultants via email dated 24/03/2026.

Table 3. List of Lithium-Ion Storage

No.	Location/Area.	Area Ref.	Room Quantity	Chemical	Class / Division	Single Room Capacity	Combined Capacity ²
1	Building 1	Data House	16	Lithium-Ion	Class 9 (non-DG ¹)	3,501 kg	56,016 kg
2	Building 2	Data House	16			3,501 kg	56,016 kg
3	Building 1	UPS Battery Room	8	Lithium-Ion	Class 9 (non-DG ¹)	672 kg	5,376 kg
4	Building 2	UPS Battery Room	8			672 kg	5,376 kg
5	Building 1	BBU Battery Storage	1	Lithium-Ion	Class 9 ³	650 kg	650 kg
6	Building 2	BBU Battery Storage	1	Lithium-Ion		650 kg	650 kg
Total electrolyte (in use, non-DG) storage quantity							122,784 kg
Total electrolyte (not in use, Class 9) storage quantity							1,300 kg

Notes:

1. Lithium-ion batteries connected to circuit are considered to be in use and are not considered dangerous goods for storage and handling compliance purposes.
2. Total storage quantity for the lithium-ion electrolyte was provided by LCI Consultants via email dated 25/03/2026. The electrolyte for the data house single room capacity was converted from 2,693 litres to 3,501 kilograms by using a conservative standard density of 1.3kg/L for lithium-ion.
3. Lithium-ion batteries stored in the BBU battery storage rooms will be either new or spent. As such these batteries are not in use, and therefore are dangerous goods

6 Regulation Quantities of Dangerous Goods

Table 4. Manifest and Placarding Quantity Limits

Description of Dangerous Goods	Equivalent Description of Dangerous Goods	Packing Group	Placarding Quantity	Manifest Quantity	Client Quantity
Flammable liquid, Category 4	Combustible Liquids (C1) (flash point < 93 °C)	N/A	10,000 L	100,000L	4,454,750 L

Note: Lithium-ion batteries are classified as Class 9 dangerous goods under the ADG Code. However, hazardous chemicals in batteries when incorporated in plant are exempt from the WHS regulations and Schedule 11 Placard and Manifest Quantities. Hence, the lithium-ion batteries in use are exempt from the dangerous goods regulations.

6.1 Placard and Manifest Quantities

The aggregate diesel tank storage exceeds manifest and placarding quantities as per Table 4. As a result, SafeWork NSW must be provided with a written notice, which includes the manifest prepared under regulation 347 together with an emergency plan as per regulation 361. In general, the facility must comply with the requirements of the WHS Regulations and SafeWork NSW.

6.2 Major Hazard Facility

The WHS Regulations state that the operator of the facility shall notify the regulator of Schedule 15 chemicals that are present or likely to be present at the facility.

The proposed 78 Lockwood Road Data Centre stores and handles combustible liquid (diesel), which is not listed in Schedule 15. Hence, MHF requirements do not apply to the proposed facility.

6.3 State Environmental Planning Policy (Resilience and Hazards)

Diesel (Class 1 combustible liquid) will be stored aboveground without flammable materials and, by definition of (NSW Department of Planning, Hazardous and Offensive Development Application Guidelines, Applying SEPP 33 (2011)), is not considered potentially hazardous.

Class 9 (stored lithium batteries, not in use) are excluded from risk screening and are not considered to be potentially hazardous.

For further information, refer to the SEPP Resilience and Hazards Risk Screening Report (NA251463-DG-01).

6.4 Environment Protection License (EPL)

Clause 9 of Schedule 1 of the Protection of the Environment Operations Act 1997 (POEO Act) states an Environment Protection Licence (EPL) is required if a proposed development has the capacity to store more than 2,000 tonnes of petroleum products, which includes diesel. Given there is well over 2000 tonnes of diesel proposed, an EPL will be required.

6.5 Lithium-Ion Batteries Connected to the System

Lithium batteries (new or used) are classified as Class 9 dangerous goods during storage or transport, and risks may be managed by implementing the relevant clause in AS 4681:2000. This would include modules in storage and spent batteries in modules or individually stored.

In the 78 Lockwood Road Data Centre, the lithium-ion batteries in data halls and UPS battery rooms are used as secondary power backup and will be continuously connected to a circuit (on charge).

Work Health and Safety Regulation 2017, Chapter 7, Regulation 328 (4)

“4. Application of regulations, these regulations do not apply to —”

(a) hazardous chemicals in batteries when incorporated in plant,”

exempts dangerous goods in a battery, installed to supply energy to any plant. Once the UPS cabinet is installed, the lithium battery cells are exempt from the Hazardous Chemicals requirements of the Work Safety and Health Regulations 2017.

7 Compliance Requirements

7.1 Diesel Storage

7.1.1 Individual double bunded tanks

The proposed individual double bunded tank diesel storage is a double-walled (self-bunded), aboveground tank located inside a generator enclosure.

The individual double bunded tanks should comply with the following key requirements as a minimum:

- The individual double bunded tanks shall be appropriately designed to AS1940:2017.
- The tank shall also be designed appropriately to AS1692:2006 with the primary and secondary containment wholly constructed of steel.
- Means shall be provided to determine the level or volume of the tank contents.
 - The normal fill level shall not exceed 95% of the tank capacity.
 - The tank shall be a high-level alarm (LAH) set at a maximum of 97% of tank capacity.
 - In addition to the high-level alarm (LAH), a physically and electrically independent high-high level alarm (LAHH) shall be provided.
- Means shall be provided to establish and monitor the integrity of the primary tank.
- An emergency shut-off device shall be provided and easily accessible on each pump.
- Overfill protection shall be provided with a suitable alarm and means of stopping fluid flow.
- Means shall be provided to prevent release of liquid by siphon flow.
- All piping connections to the tank shall be above the normal maximum fill level.
- Adjacent tanks shall be separated by at least 600mm.
- The generator enclosures shall be protected against damage from impact with vehicles and mobile equipment (i.e. provided with bollards or barrier).
- The fill point will be readily accessible and protected from accidental damage.
- The tanks shall be provided with a free vent adequately sized considering the tank volume and the expected diesel flow rates. The vent shall terminate at least 4m from ground level, shall be separated from any building opening by at least 2m and shall be protected from ingress of foreign material.
- The generator enclosure is to be bonded and earthed to avoid any risk associated with static electricity generated during diesel fuel unloading.
- For safety requirements, smoke detectors and fire alarms should be installed at each generator. Each generator should be interlocked with an automatic shutoff with any smoke alarm.

- Audible alarms should also be located adjacent to tanks so that personnel can become aware and escape any hazardous scenario.

7.1.2 Day tanks

The day tanks are classified as Category 3 tanks, and service tanks. They should comply with Section 5.14 of AS1940:2017, as well as other relevant sections, with the following storage and handling requirements identified:

- The vent discharge for combustible liquids shall be located laterally by at least 2m from any opening into a building or a vent intake and at least 4m above ground level.
- The day tanks shall be provided with means to contain the spread of any small leak or spill.
- The day tanks should be fitted with a high-level alarm set at a maximum of 97% and normal fill level set a maximum of 95% of the tanks' capacity.
- Emergency shut-off provision shall be provided from the storage tank and service tank to the generator.
- An emergency shut-off device shall be provided and easily accessible on each pump.
- Provision shall be made to shut off the flow of liquid quickly in an emergency from the storage tank and service tank and to a tank vehicle fill point.
- If there is a return system, it shall incorporate at least two independent overfill shut-off devices, arranged such that each will continue to function to prevent an overfill in the event of failure of the other device.
- A day tank shall be interposed between a storage tank and a burner, engine or other fuel consuming equipment if:
 - The storage tank is higher than the consuming equipment;
 - The supply pressure that the consuming equipment can tolerate might otherwise be exceeded; or
 - When for any other reason it is necessary to provide a limited storage or pressure-controlling facility close to the consuming equipment.
- The service tank shall be located close to the consuming device.
- Where liquid is pumped from a storage tank to a service tank at a higher level (irrespective of any level control device which is fitted) an overflow pipe to the storage tank shall be provided. The overflow pipe shall have sufficient capacity to return the full capacity of the pump to the storage tank without spillage.
- Lighting within the room provided during hours of operation, sufficient to enable a person to easily read all markings on signs, instruments and other necessary items. (Minimum value of 50 lx).

7.1.3 Diesel Fire Pump Tank

Diesel fire pump tanks are also classified as Category 3 tanks, and service tanks. They are to comply with the same requirements as listed in Section 7.1.2.

7.1.4 Fuel Piping

The fuel piping shall comply with AS1940:2017, AS4041:2006 and AS4897:2008. The key requirements are as follows:

- The piping shall be suitable for the expected working pressures, temperatures and structural stresses and the material shall be compatible with diesel.
- The following considerations shall be applied:
 - Accessibility during operation, testing, maintenance, replacement or drainage;

- Support and fixing;
 - Exposure to mechanical damage, particularly at the tanker offloading area;
 - Corrosion protection, particularly for piping located outdoors or underground;
 - Integration with any cathodic protection;
 - Pressure and thermal relief;
 - Expansion and contraction of piping with site conditions;
 - Drainage for any trench in which pipes are laid;
 - Protection for any buried piping from superimposed loads or ground settlement;
 - Electrical bonding and earthing as per AS/ NZS 1020:2023 and SA TS 60079.32.1; and
 - Painting and marking of piping for identification of its contents as per AS1345:1995.
- Should any portion of the piping system be directly laid in the earth, it should be located at least 300mm below ground level, suitably protected if the area is subject to vehicular traffic and protected from corrosion.
 - Secondary containment for diesel piping shall be double-walled piping with interstitial space.
 - Vent piping between the tank vent connection and the discharge point, will fall consistently back to the tank at a slope of at least 1:100.
 - A vent pipe shall not pass through building foundations but may be embedded in concrete that is part of other building construction.
 - Joints in vents shall be of such quality as to prevent vapour leaking, and located so that any leaking that might occur, is prevented from accumulating inside or transferring into enclosed spaces.
 - Where vent piping penetrates a fire-rated wall, it will be installed to maintain the fire resistance of the wall.

7.2 Tanker Unloading Area

The tanker offloading area is to be designed to AS1940:2017. The key requirements are as follows:

- The fill point shall be readily accessible and protected from accidental damage and shall be clearly identified and shall comply with AS4977:2008.
- The diesel fuel fill points shall be fitted with a 15-litre capacity device, to catch and contain any minor spill during diesel unloading process.
- The areas around the tank fill point and the vehicle hose connection point shall be impervious to the product.
- If the fill point is at or below the highest likely level of liquid in the tank or piping system, the fill connection shall be a dry-break type, incorporating a manual shut-off valve immediately upstream of the coupling. Where the fill point is beyond the security fence around the installation, a non-return valve shall be incorporated in the piping system at the security fence.
- Non-return valve will be located at each tank fill line, close to the filling connection or an anti-siphon opening will be made in the filling line, above the tank's maximum liquid level.
- Ensure the length of the fuel transfer hose shall be kept to a minimum.
- It is recommended to undertake a fuel tanker swept path analysis to ensure there is enough space for the fuel tanker to drive through the site, without needing to reverse.

- The location of the tank fill points should be such that the road tanker can stand wholly off any public road and be able to drive forward.
- Sufficient lighting shall be provided for the road tanker unloading area to provide safe working conditions and clear visibility of all signs, level instrumentation and alarms.
- Ensure the tank level indicator is visible to the fuel tanker driver.

7.3 Pumping Equipment

Fuel pumping equipment shall comply with AS1940:2017 Clause 6.4. Key requirements are as follows:

- Where the downstream of the pump can be shutoff, provision shall be made to prevent or relieve potential excess pressure or thermal effects. This could be achieved via provision of a hydraulic relief valve; and
- An emergency shut-off device shall be provided on each pump. This device shall be readily accessible and clearly labelled.

7.4 Spillage Containment

Provision shall be made to contain any leak or spillage and prevent contamination of the surrounding area and/or stormwater system. Therefore, the following recommendations will be considered:

- A spill response kit will be supplied to the store area to contain the spread of any leak or spill from fittings.
- To reduce the risk of stormwater contamination, the drainage system within the diesel fuel area should be covered during fuel tanker unloading.
- The diesel fuel fill points shall be fitted with a 15-litre capacity device, to catch and contain any minor spill during diesel unloading process.

Tanks are double walled tanks and have leak detection to monitor any leaks from the primary tanks. All the tanks are designed to the AS 1940: 2017 and AS 1692: 2006. Administrative controls can be utilised such as operational, maintenance, housekeeping and required tests to ensure that the integrity of the tanks is maintained, and leaks are prevented.

7.5 Separation Distances

7.5.1 Individual double bunded tanks

Based on AS1940:2017, the minimum separation distances applicable to 22,700 L, double-walled, outdoor, aboveground diesel storage tanks are as follows:

Table 5. Individual Double Bunded Tank Separation Distance as per AS1940:2017

Separation required from aboveground tank to:	Minimum distance required
On-site protected places (such as offices, other DG stores)	4.2 m
Security fence	7.5 m or diameter of tank (whichever is less but at least 3 m)
Off-site protected place	4.2 m
From another horizontal tank	600 mm

Notes:

1. The tanks should not be arranged end-to-end.
2. Combustible vegetation should be maintained at least 3m away from any tank enclosure.

7.5.2 Day tanks

In accordance with AS 1940:2017, the minimum separation distances applicable to 990 L, double walled, storage tanks are listed below:

Table 6. Day Tank Separation Distance as per AS1940

Separation required from day tank to:	Minimum distance required (m)
On-site protected places (such as offices, other DG stores)	Unrestricted
Security fence	3
Off-site protected place	Unrestricted

7.5.3 Diesel fire pump tanks

In accordance with AS 1940:2017, the minimum separation distances applicable to 515 L, double walled, storage tanks are listed below:

Table 7. Fire Pump Tank Separation Distance as per AS1940

Separation required from day tank to:	Minimum distance required (m)
On-site protected places (such as offices, other DG stores)	Unrestricted
Security fence	3
Off-site protected place	Unrestricted

7.5.4 Aggregate fuel tanks

While technically the tanks are not under a roof, and clause 5.2.5 of AS 1940 therefore isn't required, the gensets containing the tanks are stacked to form one major structure and so there is an increased chance of a fire at one tank impacting others.

Therefore, it is recommended that clause 5.2.5 is considered in this instance and that separation distances should be based on the aggregate volume of all the tanks. The aggregate capacity of the tanks will be approximately 4.5 ML .

In accordance with AS 1940:2017, the minimum separation distances applicable to 4.5 ML , C1 combustible liquid storage tanks are listed below:

Table 8. Aggregate Tank Separation Distance as per AS1940

Separation required from day tank to:	Minimum distance required (m)
On-site protected places (such as offices, other DG stores)	7.5
Security fence	7.5
Off-site protected place	25

7.5.5 Proposed Separation Distances

As seen in Figure 3 and Figure 4 below the proposed separation distances for the 78 Lockwood Road Data Centre appear to be compliant.

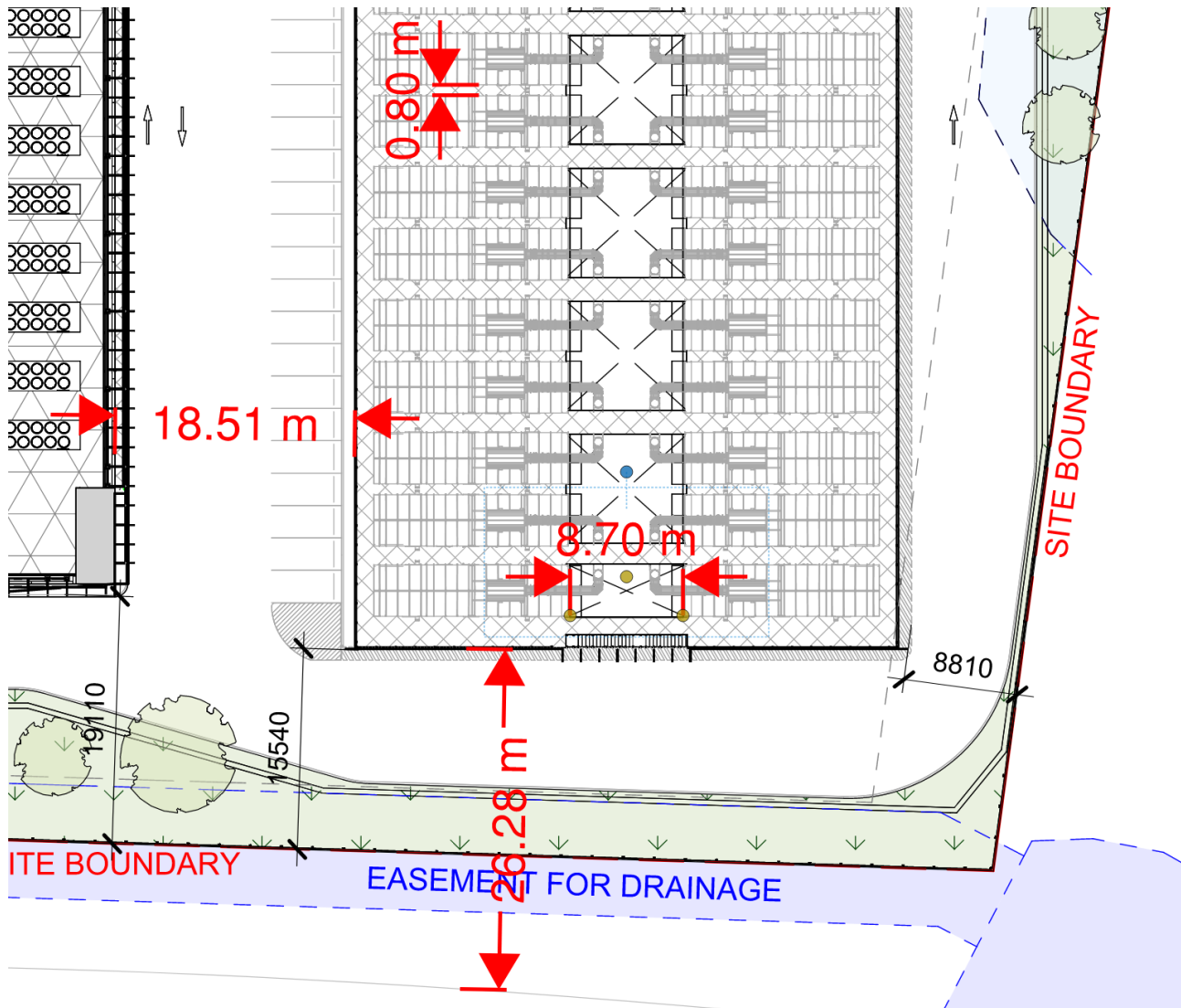


Figure 3 Proposed Layout Separation Distances (Generator Gantry)

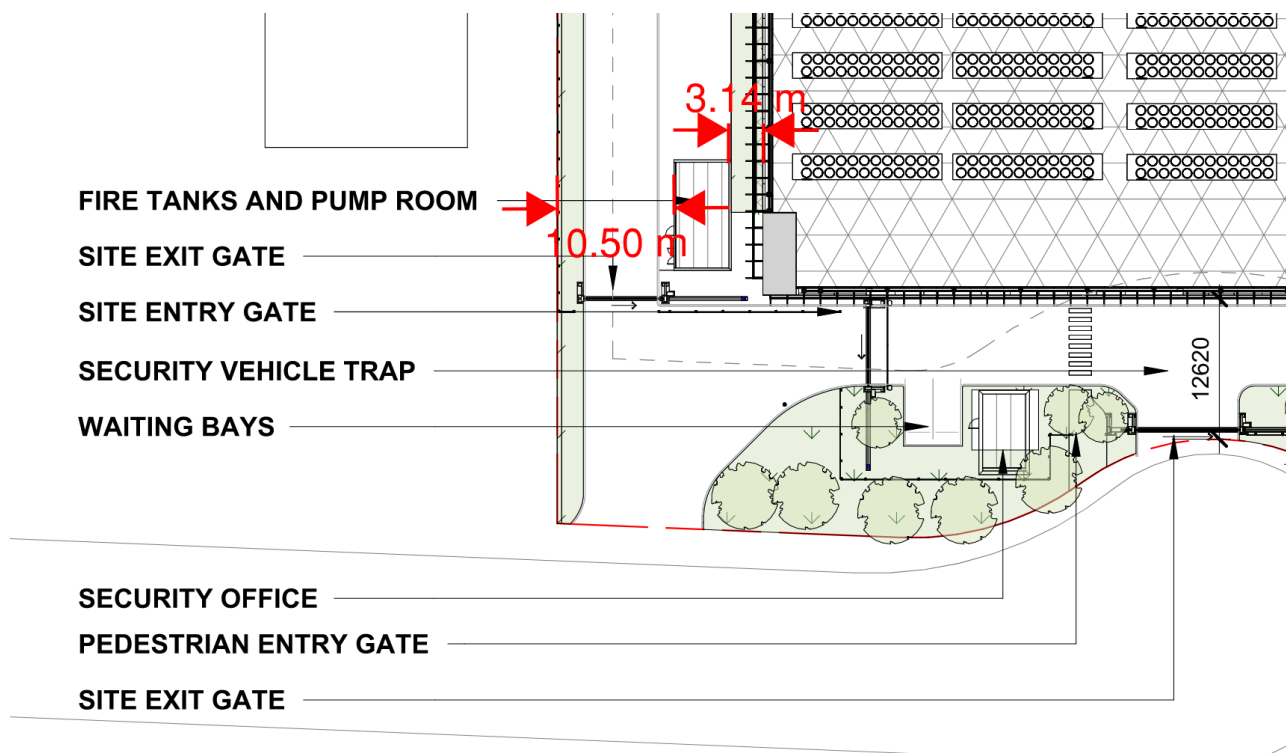


Figure 4 Proposed Layout Separation Distances (Data Hall and Fire Pump Tanks)

7.6 Fire Protection

As a minimum, the fire protection system will meet the requirements of AS1940:2017 Section 11.13. The following fire protection equipment shall be provided for the diesel and batteries systems.

- At the storage tank area considering that the individual double bundled tanks have an aggregate capacity of over 4 ML, the requirements of AS1940:2017 Clause 11.13 shall apply.
- The installation shall be provided with at least the following:
 - Sufficient hydrants to reach all parts of the compound.
 - Accessories and foam concentrate, as applicable.
 - Foam-making equipment for the gantry is not required for compliance with AS 1940 but may be requested by FRNSW.
 - One powder-type extinguisher per tank, with a minimum of three powder-type extinguishers for the storage area, strategically located around the storage.
 - When the term 'powder-type extinguisher' is used it shall mean a portable powder-type fire extinguisher having a rating of at least 2A 60B(E) and 9 kg capacity.
- Fire hydrant systems shall be in accordance with AS 2419.1 for both buildings and open yards.
 - AS 2419.1 permits the use of street hydrants in lieu of onsite fire hydrant systems where the performance and location requirements of AS 2419.1 are satisfied.
 - The National Construction Code (NCC) requires all buildings greater 500 m² in aggregate floor area to be served by a fire hydrant system.
- Compound fire extinguishers must be located within 15m from the storage tank area.

- At the tank vehicle delivery location (i.e. fill point area), at least one powder-type portable extinguisher shall be provided within 10 m of a hose connection point or a manifold with a minimum of two powder-type extinguishers for the installation.
- The fire detection, warning and alarm system within the facility shall comply with AS1940:2017, AS1670 and AS1603.5:1996. Its power supply shall be independent of the main electricity isolating switch for the area and shall be connected to a fire station nominated by Fire and Rescue NSW. Manual alarm call points shall be located at convenient and safe locations around the facility.
- The UPS battery room fire suppression system is to be designed and installed as per FM Global Data Sheet 5-33 and NFPA 855.
- Any fire water or fire debris contaminated with chemicals is classified as Controlled Waste. A release of such content to the outside boundary of this site or to groundwater is considered a violation to the Environment.
- Any fire hose reels shall comply with AS/NZS 1221:1997 and AS 2441:2005.

7.6.1 Contaminated Fire Water Holding Tank

There is a 330 kL nominal capacity holding tank that will store contaminated run off fire water used during an emergency fire situation, with the final volume to be confirmed within the fire safety study. The following requirements of AS 1940 apply to holding tanks of contaminated fire water:

- Pipework that is intended to convey any spilt liquid to a remote holding tank or compound shall be resistant to fire.
- It is recommended to prevent flashback into the storage area or flashover between storage tanks.
- The drainage of any rainwater or fire water to outside the compound shall either be
 - via a suitable interceptor or separator (e.g. a molecular sieve); or
 - after sampling and testing of the water.
- Consideration in the design of the site shall be given to containment of fire water resulting from the management of a site emergency. The design should be such that from a typical spill and fire scenario the management of contaminated fire water can be retained within the site to enable the proper safe clean-up of this effluent.
- If diesel is to makeup part of the contaminated fire water, then the requirements of Section 7.1.3 Fuel Piping apply.
- The requirements of Section 7.4 Spillage Containment apply for the contaminated fire water holding tank.

7.7 Emergency Response Plan

The Regulations require Stack to prepare and implement a written emergency plan for dealing with any dangerous event associated with the storage and handling of dangerous goods at the site. Stack should ensure that the site emergency response plan/procedure meets the following requirements:

- Information on the size and complexity of the installation, its resources, and personnel.
- Consider any potential for the occurrence of fire, explosion, natural disaster, reaction, or release of dangerous goods.
- The operator of the site must ensure there is an emergency plan for the site and a copy of current plan is kept on the site; and
- Regularly reviewed and updated, as necessary.

Lithium-ion batteries room to be considered in the emergency management plan with respect to fire hazards.

7.8 Placards

Any dangerous goods storage and handling site with more than a placard quantity of dangerous goods must:

- Ensure that an 'HAZCHEM' is displayed at every main entrance to the site. The placard must display the word 'HAZCHEM' in red letters on a white or silver background.
- Be visible from the normal direction of approach to site.
- Be regularly reviewed and updated, as necessary.

Table 9. Placarding requirements as per AS1940:2017

Location	Placarding Required
At the entrance(s) to the Data Centre facility	■ HAZCHEM sign, black letters on a white background, at least 120mm high and 100mm lettering size; ■ A WARNING—RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY sign; ■ A sign listing the emergency contact names, titles and phone numbers relevant to the installation; ■ The name, address, and phone number of the occupier; and ■ A layout diagram showing the location of fire protection facilities, the drainage system and the 'Emergency Stop' switches.
At the entrance(s) to DG storage areas (Diesel tank/ pump rooms and Generator Rooms)	■ A DANGER—NO SMOKING, NO NAKED FLAMES sign; ■ A WARNING—RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY sign. ■ For combustible liquids, a COMBUSTIBLE LIQUID sign at least 100mm lettering size.
Tanker Offloading/ Delivery Area	■ A prominent sign on or near the dispenser shall be marked in letters at least 50 mm high as STOP ENGINE—NO SMOKING. ■ Each fill point for storage tank shall be clearly identified.
Storage Tank markings	■ Tank identification numbers/ letter; ■ Tank contents, e.g., 'COMBUSTIBLE LIQUID'. ■ Tank Capacity. ■ Markings shall be displayed on the outside walls of the tanks and shall be not less than 500mm in height for tanks having a diameter of 6 metres or greater. For tanks of less than 6 metre diameter the markings shall be not less than 150mm in height. ■ All markings shall be of a colour contrasting with that of the tank; ■ A sign bearing the words 'NO SMOKING, NO IGNITION SOURCES; and ■ The markings shall be clearly visible from main alternative access points likely to be used by the fire authority.
Aboveground pipework	■ All above-ground pipes shall be colour-coded or labelled.

All placards must be clean, in good order and unobstructed. These must be located so that they are clearly legible to persons approaching and shall be separated from any other sign or writing that contradicts, qualifies, or distracts attention from the placard.

Where two or more points of access are adjacent to each other so that a single set of signs and notices are clearly readable from each point of access, duplicate signs and notices are not required. Signs shall comply with AS 1319. Class labels shall conform to AS 1216 and be a minimum of 250mm square. Other signs shall have lettered at least 50mm high.

7.9 Safety Information

Safety information, intended principally for emergency services, shall be provided at a suitable location near the entrance to the facility and include:

- The location of the emergency plan.
- The location of the manifest.
- The location of PPE and clean-up equipment.
- The location of utilities and their isolation points.

Such information shall be available at the site main entrance, or at one entrance, if there is more than one access point.

7.10 Lithium-Ion Battery Circuit Assessment (In Use)

The following safety considerations apply to the proposed battery houses and UPS battery rooms where batteries are connected to circuit in the 78 Lockwood Road Data Centre:

7.10.1 Construction

The wall and floor should be one hour fire rated and the door should be an electromechanical or electromagnetic holding mechanism interlocked to close the door on smoke detector actuation.

7.10.2 Human element

An emergency response plan shall be developed. Refer to Section 7.7.

7.10.3 Waste Disposal

Waste batteries will not be stored on site and there will be no dedicated waste battery store. Spent batteries will be removed by the maintenance contractor during battery replacement and taken off site.

For disposal of waste lithium-ion batteries, the following measures should be taken to reduce hazards:

- Cover/ protect battery terminals or loose wires using non-conductive tape.
- Collection units and aggregated waste stacked provided to prevent risk of falling objects.
- Use containers with adequate ventilation (e.g., venting cap):
 - Use plastic or cardboard UN-approved containers for battery storage.
 - Avoid storing batteries in metal containers, which could lead to a fire risk. If using metal storage, line with electrically non-conductive lining material (e.g., plastic bag, wood)
- Provide non-conductive and non-combustible cushioning material to fill the void between batteries.

7.10.4 General safety considerations

- Wiring and its installation will be sufficient to withstand the maximum anticipated voltage, current, temperature, altitude, and humidity requirements.
- The casing of a cell, module, battery pack and battery system will incorporate a pressure relief function that will preclude rupture or explosion.
- The design of the battery system will be such that abnormal temperature-rise conditions are prevented.
- Terminals will have clear polarity markings on the battery packs or the system's external surface.
- The cell manufacturer will provide information about the product's current, voltage and temperature limit.
- The battery system will be provided with a voltage control function to ensure the voltage of each cell does not exceed the upper limit charging voltage specified by the manufacturer.

7.11 Lithium-Ion Battery Storage Assessment (Not In Use)

The following requirements apply to the new and spent lithium-ion batteries stored in BBU storage rooms within the 78 Lockwood Road Data Centre, as detailed in Table 3. The batteries are not in-use and as such are considered dangerous goods. The following requirements apply as well as those listed in Section 7.10.

7.11.1 AS/NZS 4681:2000

During the transport and storage of lithium-ion batteries (new or used), the cells are regarded as Class 9 dangerous goods, and risks may be managed by implementing the relevant clause in AS/NZS 4681. The proposed battery storages in the 78 Lockwood Road Data Centre are classified as Class 9 dangerous goods (UN3480).

Therefore, the following minimum requirements are applicable:

- The BBU battery storage rooms are considered 'rooms within a building' as per the store definition in AS/NZS 4681.
- Stores for storage of lithium batteries shall be separated from protected places and boundaries by at least 3 m as per the standard.
 - Separation distances may be achieved by the use of screen walls.
 - Such a screen wall shall have an FRL of at least 60/60/60. However, from previous experience FRNSW generally requests a 2 hour minimum rating.
- The maximum storage height of the batteries shall be marked within each room. This is nominally below the sprinkler system and shall be based on any fire protection advice for effective fire protection performance.
- The store construction shall be non-combustible.
- Sufficient lighting shall be provided during the hours of operation, that includes safe working conditions, and clear visibility of all signs, labels, instruments and other necessary items.
- Adequate natural or mechanical ventilation shall be provided.
- Where mechanical ventilation is provided, it shall comply with AS 1668.2.
- All access ways shall be maintained in a safe condition. Where racking is installed, their layout shall allow for clear passage of personnel.
- Storage areas shall be secure against unauthorised entry.
- The appropriate dangerous goods class labels, with sides of at least 250 mm.
- A warning sign to restrict unauthorized entry.
- Where applicable, a warning sign to prohibit smoking and other ignition sources, e.g. 'DANGER: NO SMOKING, NO IGNITION SOURCES'.
- Where applicable, warning signs indicating the presence of elevated temperature liquids.
- Fire protection requirements shall be based on consultation with authorities and the standard (AS/NZS 4681).
 - AS/NZS 4681 requires as a minimum, fire protection as per BCA requirements and portable fire extinguishers.
- Fire sprinkler systems shall be installed in accordance with AS 2118 and maintained in accordance with AS 1851.3.

- Stores of dangerous goods shall be adequately protected from adjacent potential fire exposures by the use of fire-rated radiation barriers. Based on previous consultation with FRNSW, each room should be separated with a minimum of 2hr fire rated walls.

7.12 Additional Recommendations

7.12.1 Individual double bunded fuel tanks

In general, the following requirements will be implemented at the diesel tank storage area:

- Any firewall heights will be a minimum of 0.5 metres above the storage tank release point (vent).
- Any windows or doors within 7 metres in a horizontal and vertical plane will have fire resistance.
- Ensure the fuel storage tank vent is located 2 metres from any on-site protected place opening.
- To ensure independent operation and maintenance of each tank, isolation valves shall be provided between the individual double bunded tanks.
- Ensure piping is adequately protected from inadvertent penetration and impact. Any grates for pipe trenches shall be design sufficiently to withstand regular vehicular traffic expected on site.
- Piping to and from the tanks must be adequately separated from electrical cables.
- The generator enclosure to be bonded and earthed to avoid any risk associated with static electricity that could be generated during diesel fuel unloading.
- The generator enclosures shall be protected against damage from impact with vehicles and mobile equipment.

7.12.2 Day tanks

For safety requirements, smoke detectors and fire alarms should be installed at each generator. Each generator should be interlocked with an automatic shutoff with any smoke alarm.

Audible alarms should also be located adjacent to tanks so that personnel can become aware and escape any hazardous scenario. Leak detection shall be implemented into tank controls to allow for quicker response and control of spillage.

Piping to and from the tanks must be separated from electrical cables to be compliant.

The proposed day tanks are “double-walled tanks” designed and manufactured to AS 1940 and AS 1692 and should comply with the following requirements:

- All piping connections to the tank shall be above the normal maximum fill level.
- Overfill protection should be provided with an alarm for high level and high-high level.
- Provide adequate clearance between the tank and any structure (a minimum of 600mm clearance is recommended around each day tank).
- Vents shall discharge outside the enclosure, 4 metres aboveground level and 2 metres from any opening to the building.
- The enclosure and its support shall be designed to eliminate enclosure failure during a fire event.
- The fill point shall be readily accessible and protected from accidental damage.
- The generator enclosure to be bonded and earthed to avoid any risk associated with static electricity that could be generated during diesel fuel unloading.
- The generator enclosures shall be protected against damage from impact with vehicles and mobile equipment.

7.12.3 Lithium-Ion Batteries

Lithium-Ion batteries located in the data halls are considered “in use” batteries meaning a SafeWork notification is not required. Recommended controls for Lithium Battery rooms are:

- Adequate ventilation
- Signage to indicate battery storage
- Firewater not to be discharged to sewer from battery room.
- Impermeable floor and wall surfaces
- Weatherproof coverings
- An easily accessible emergency spill kit
- Routine inspection and housekeeping procedures
- Smoke and heat detection and non-water-based response equipment
- Unobstructed access to serviceable dry powder fire extinguishers
- Clear paths of travel with unobstructed exits for personnel

For disposal of waste batteries, the following measures should be taken to reduce any hazards:

- Protect battery terminals or loose wires using non-conductive tape
- Collection units and aggregated waste stacked to prevent risk of falling objects
- Use containers with adequate ventilation (e.g., venting cap):
 - Use plastic or cardboard UN approved containers for battery storage at your facility.
 - Avoid storing batteries in metal containers as this could lead to a fire risk. If using metal storage; line with electrically non-conductive lining material (e.g., plastic bag)
- Provide non-conductive and non-combustible cushioning material to fill empty space between batteries.

8 Conclusion

This report documents the recommended controls for the storage of diesel fuel (C1 combustible) and UPS lithium batteries associated with the 78 Lockwood Road Data Centre in accordance with the regulations and to operate with acceptable risk to people, property, and the environment.

The dangerous goods stored at 78 Lockwood Road Data Centre comply with relevant standards and can be stored safely provided that all the design requirements of dangerous goods listed in this report are met and all outstanding risk control measures are implemented.