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Preliminary Risk and Hazard Analysis


Project Atlas Data Centre
10 Roberts Rd, Eastern Creek NSW 2766

Client: Goodman Property Services (Aust)
Pty Ltd

25 March 2026
SSDA Submission
Report No. F202837_PHA_A

Report Revision Details

Report Revision History

Rev	Date issued	Reason for Issue	Prepared by	Reviewed by	Verified by
00	30/01/2026	Draft for Comment	Jing Liang <i>PhD (Mechanical)</i> <i>MPhil (Fire Safety)</i> <i>BSc (Applied Physics)</i>	Alex Chubb <i>GradDip Fire Safety,</i> <i>BEng Mech</i> <i>MIEAust</i>	Sandro Razzi <i>BE (Building), Grad. Dip.</i> <i>(Performance Based</i> <i>Building and Fire Codes),</i> <i>FIEAust,</i> <i>CPEng 2180287</i>
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Document Revision History

Rev	Date issued	Comment
00	30/01/2026	Draft for Comment
A	25/03/2026	Final Issue including the following changes: <ul style="list-style-type: none"> • Update of report format throughout • Inclusion of Specific SEARS agency commentary in Section 1. • Update of Section 2.3 - Sources of Information • Inclusion of the Bushfire Hazard Assessment Report (refer Section 5.3). • Minor updates throughout

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Executive Summary

This Preliminary Risk Screening (PRS) and Preliminary Hazard Analysis (PHA) been prepared by CORE Engineering Group to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek within in the Blacktown Local Government Area (“LGA”). The site is legally described as Lot 553 in DP1110447.

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) issued for the Project Atlas Data Centre (SSD - 101067971) dated 16th January 2026

A review of the proposed hazardous goods stored within the proposed data centre located at 10 Roberts Rd, Eastern Creek NSW 2766 was conducted against the requirements of Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) and Work Health and Safety Regulation 2025. It was found that both diesel storage and the Lithium-ion Batteries quantities proposed to be stored on the site will exceed the WorkCover NSW (now SafeWork) notification and manifest threshold and the Work Health and Safety Regulations threshold quantities of Part 7.1.

Therefore, Regulatory requirements are triggered for:

- WorkCover NSW notification (now Safe Work NSW)
- A dangerous goods manifest
- Safety Data Sheets (SDS)
- Appropriate cleanup equipment be kept onsite
- An Emergency Response Plan (ERP) is to be produced for the site

Additionally, as the proposed diesel fuel and battery storage exceeds the Schedule 1 quantities in PotEOPA, an EPA license will be required for the site.

As per Section 6, a Preliminary Hazard Analysis was then conducted which undertook a qualitative assessment of risks associated with the configuration and operations of the site. The assessment evaluated the risks of the site with potential to impact and risk of human fatalities, property damage and environmental pollution. Hazard treatment measures have been proposed, where required, to produce a ‘As Low As Reasonably Practicable’ level of risk in accordance with the risk acceptance criteria described in Section 6.1. Proposed prevention and mitigation control measures are identified in Section 6.4 and shall be implemented into the design and construction for the site.

Further to the PRS and PHA, as required by the SEARs, the assessment demonstrated consideration of the following:

- That 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
- That 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 – Secondary 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.

Therefore, it is considered that the proposed development with suitable engineering and design controls in place, would not be considered to be an offensive or hazardous development on site.

Note, it is expected that a Fire Safety Study in accordance with HIPAP No.2 will be required as a condition of the consent for the project and will be undertaken during the project development.

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1. Introduction

A State Significant Development Application (SSDA) has been prepared to support a data centre at 10 Roberts Road, Eastern Creek and associated offsite enabling infrastructure.

The proposal will include:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and 24/7 operation of a Data Centre
- Offsite enabling infrastructure
- 2 Data Centre Buildings
 - Building 1 – 2 Level + rooftop plant
 - Building 2 – 3 Level + rooftop plant
- Ancillary office, EOT and amenity
- Provision of required utilities including:
 - diesel storage tanks
 - water tanks
 - substations on site
- Vehicle access for 20m articulated vehicles (semi-trailers)
- Associated landscaping and site servicing
- Installation of site services and drainage infrastructure

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project Atlas Data Centre (SSD- 101067971) dated 16th January.

Specifically, this report has been prepared to respond to the SEARs requirements issued below:

Table 1-1: Relevant SEARS Reporting Obligations to this report

Item	Description Of Requirement	Section Reference (This Report)
14. Hazards and Risk	Details regarding the location and number of any proposed back-up power units, back-up fuel storage tanks and lithium-ion or other battery chemistries (with details of peak discharge rate in MW) to be installed to service the development	Section
	A preliminary risk screening completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 and Applying SEPP 33 (DoP, 2011), that includes a clear indication of class, storage and handling quantities and location of all dangerous goods and hazardous materials associated with the development	Section 5
	A Preliminary Hazard Analysis (PHA) prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011), should the preliminary risk screening indicate that the project is “potentially hazardous”	Section 6
	Demonstration that 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 Demonstration that 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 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications	Section 7

	AS 1940 – Storage and handling of flammable and combustible liquids.	
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Table 1-2: Relevant Project Specific SEARS agency commentary

Item	Description Of Requirement	Section Reference (This Report)
9 - NSW EPA	2. EPA Licensing and Approval Requirements 2.1. Identify all approvals and licences required under environment protection legislation including details of all scheduled activities under schedule 1 of the Protection of the Environment Operations Act 1997.	Section 5.4
34- Blacktown Council	Details regarding the fuel storage and bunding design are to be submitted with the DA for assessment	Section 4.2 & 6.4.1

1.1 Preliminary Risk Screening

The PRS is used to compare the proposed design, site constraints and operational features to the relevant requirements of the applicable Legislation. Through this process the hazard/s or hazardous materials or goods that exceed the thresholds included in the legislation can be identified. Where these thresholds are exceeded the need for additional analysis and controls may be identified. The applicable Legislation in NSW is the State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP 33) and Work Health and Safety Regulations 2025 (WHSR). Where these thresholds are exceeded and at the discretion of the Authority Having Jurisdiction (AHJ) the development of a PHA may be required.

1.2 Preliminary Hazard Assessment

The PHA shall identify risks applicable to the site that are not within the acceptable levels laid out within the PHA and apply mitigating controls reach to an acceptable level. To do this a multi-level risk assessment (MLRA) shall be produced via the methodology outlined in Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis (refer Figure 1-1) [7]. The methodology of HIPAP 6 may be summarised as follows:

- Identification of the nature and scale of all hazards at the facility, and the selection of representative incident/consequence scenarios to be considered.
- Analysis of the consequences of these incidents on people, property and the biophysical environment and the likelihood of such events occurring without controls in place
- Estimate the likelihood of hazardous events.
- Propose risk treatment measures.
- Qualitatively assess the resulting risk levels for the facility and comparison of these risk with the established risk criteria
- Qualitatively determine the residual risk assuming the implementation of the risk treatment measures/controls and compare against the same established risk criteria to determine if the risk has been adequately reduced.

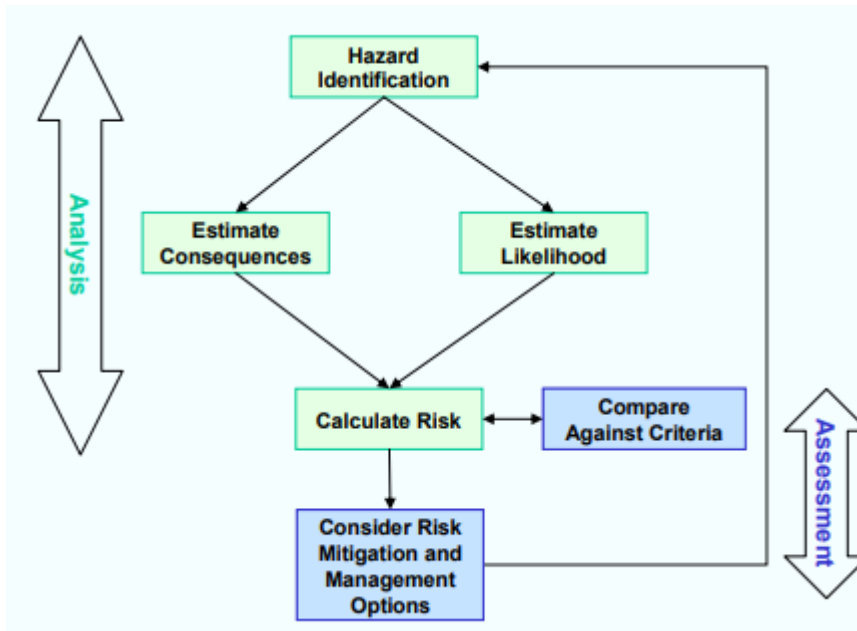


Figure 1-1: Basic Methodology for Hazard Analysis (HIPAP 6) [7]

2. Project Scope

2.1 Overview

This Preliminary Risk Screening (PRS) and Preliminary Hazard Analysis (PHA) been prepared by CORE Engineering Group to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek within in the Blacktown Local Government Area (“LGA”). The site is legally described as Lot 553 in DP1110447.

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) issued for the Project Atlas Data Centre (SSD - 101067971) dated 16th January 2026

The proposal will include:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and 24/7 operation of a Data Centre
- Offsite enabling infrastructure
- 1x 3 and 1 x 4 level Data Centre Buildings
- Ancillary office, EOT and amenity
- Provision of required utilities including:
 - diesel storage tanks
 - water tanks
 - substations on site
- Vehicle access for 20m articulated vehicles (semi-trailers)
- Associated landscaping and site servicing
- Installation of site services and drainage infrastructure

2.2 Relevant Stakeholders

This PRS and PHA has been developed collaboratively with the relevant stakeholders as identified below:

Table 2-1 Relevant Stakeholders

Role	Name	Organisation
Architects	Erik Escalante Wee Kee Goh Nathan Jones	Grimshaw Architects
BCA Consultant	Dean Goldsmith	BM+G
Bushfire Consultant	Corey Shackleton	BlackAsh Bush Fire Consulting
Client Representative	Athena Vercoe Alison Kong Nick Kough	Goodman
Electrical Engineer	Sina Haidar Vishaal Deo	LCI Consultants
Fire Services Engineer	Michael Nikoloski	
Fuel Systems Engineer		
Mechanical Engineer	Zoia Geller	

Role	Name	Organisation
Fire Risk Engineer	Alex Chubb Jing Liang Sandro Razzi	CORE Engineering Group
Security Consultant	John Khan	BMM Engineering
Structural Engineer	Chris Koenig	BG&E

It should be noted that at times some parties may have a vested interest in the outcome of the Preliminary Risk and Hazard Analysis. Such parties can include local fire brigades, insurers, Environmental Protection Authority (EPA), project control groups, end users and community representatives. Although not always a legislative requirement, the design team should give due consideration to their inclusion in the Preliminary Risk and Hazard Analysis process. Where not required by legislation it is the client’s decision to involve such parties, especially local fire brigade, to ensure a transparent and adequate fire safety solution for all. Where we are not notified of the inclusion of such parties it is assumed the client / representative has given due consideration to the above.

2.3 Sources of Information

The following sources of information have been provided by the design team:

- Dangerous goods quantities summary provided by design team dated 28/01/2026 – Refer Appendix B
- NCC Assessment Report Revision A prepared by BM+G, dated 10/02/2026
- Dial before you dig enquiry, BYDA Seq No 267389817, Job No. 52229930
- Bushfire Hazard Assessment Report by BlackAsh Bushfire Consulting Rev 1 dated 11/02/2026
- Architectural Plans provided by Grimshaw Architecture as indicated in Table 2-2 below.

Table 2-2 Drawings

Drawing No.	Description	Issue	Date
ATL-GRM-XXX-XX-DG-AR-SSDA A001001	COVER SHEET- SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A030000	GENERAL ARRANGEMENT PLAN -GROUND FLOOR - SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A030001	GENERAL ARRANGEMENT PLAN - LEVEL 1 - SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A030002	GENERAL ARRANGEMENT PLAN - LEVEL 2- SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A030003	GENERAL ARRANGEMENT PLAN - LEVEL 3- SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A030004	GENERAL ARRANGEMENT PLAN – ROOF LEVEL - SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A060006	GENERAL ARRANGMENT ELEVATIONS - SSDA	A	26/02/2026
ATL-GRM-XXX-XX-DG-AR-SSDA A070007	GENERAL ARRANGMENT SECTIONS - SSDA	A	26/02/2026

The following Regulations, Australian Standards and FM Global Data Sheets have also been considered where applicable in this report:

- AS 1668.1:2015 – The use of mechanical ventilation and air–conditioning in buildings
- AS 1851:2012 – Routine service of fire protection systems and equipment

- AS 1940:2017 – The storage and handling of flammable and combustible liquids
- AS 2067:2008 – Substations and high voltage installations
- AS 2118.1:2017 – Automatic Fire Sprinkler Systems
- AS 3745: 2010 - Planning for Emergencies in Facilities
- AS 4897:2008 – The design, installation and operation of underground petroleum storage systems
- AS/NZS 3000:2018 – Electrical installations
- AS/NZS 3010:2005 – Electrical installations—Generating sets
- AS/NZS 4681:2000 - The storage and handling of Class 9 – Miscellaneous dangerous goods and articles
- Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.9, 2024
- FM Global Property Loss Prevention Data Sheet 5-32, Data Centers and Related Facilities, October 2024
- FM Global Property Loss Prevention Data Sheet 5-33, Lithium-Ion Battery Energy Storage Systems, April 2025
- FM Global Property Loss Prevention Data Sheet 7-32, Ignitable Liquid Operations, April 2025
- Hazardous and Offensive Development Application Guidelines – Applying SEPP 33, January 2011
- Hazardous Industry Planning Advisory Paper No 4 Risk Criteria for Land Use Safety Planning, dated January 2011, by NSW Department of planning
- Hazardous Industry Planning Advisory Paper No 6 Hazard Analysis, dated January 2011, by NSW Department of planning
- IEC 62619:2022 - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications
- ISBN Compliance code Hazardous Substances , dated December 2019, by Safe Work Victoria
- ISBN Hazard identification major hazard facility, dated December 2019, by Safe Work Victoria
- National Construction Code (NCC), Volume 1 – Building Code of Australia (BCA) 2022 by Australian Building Codes Board (ABCB)
- Planning Secretary’s Environmental Assessment Requirements – Data Storage Centres
- Protection of the Environment Operations Act 1997
- UL 9540A Battery Energy Storage System (ESS) Test Method, November 2017
- Work Health and Safety Regulation 2025 [NSW] under the Work Health and Safety Act 2011

2.4 Methodology

As indicated previously, this report will identify the hazards present in the site, the risk associated with those hazards and through this develop mitigating controls from both relevant standards as well as supporting literature and expert judgment.

A PRS and PHA will be developed to undertake this task, and through the combined information of these two processes, recommendations of relevant control measures to mitigate risk to an acceptable level shall be determined. The process is summarised in Figure 2-1 below.

A qualitative risk assessment is deemed to be appropriate to satisfy the requirements of HIPAP 6 through the PHA process, due to the current early design phase of the project, the well understood nature of the hazards and the design team’s previous experience at implementing such controls into similar developments.

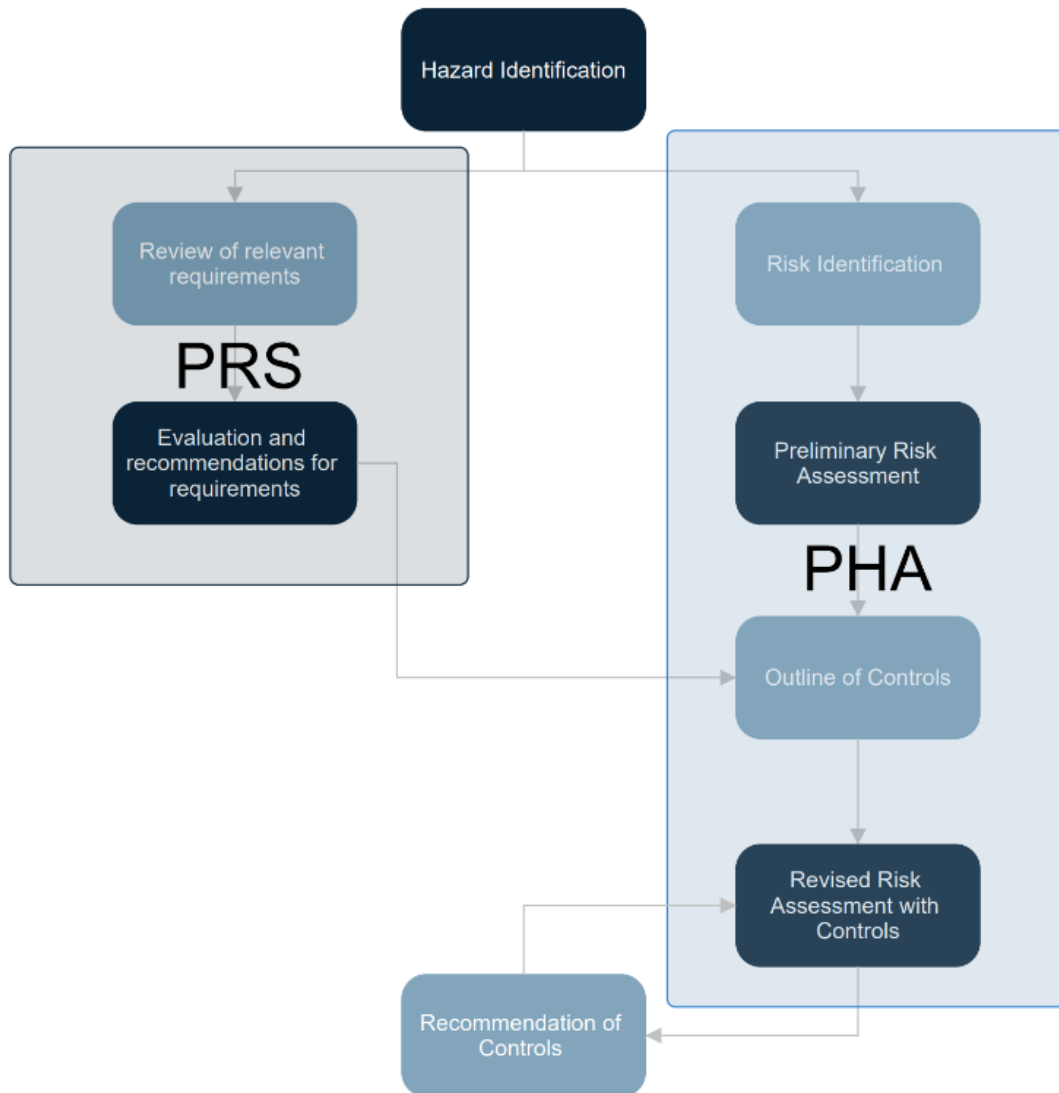


Figure 2-1: Flow Chart of Methodology

2.5 Limitations & Assumptions

In this instance the Preliminary Risk and Hazard Analysis is developed based on applicable limitations and assumptions for the development which are listed as follows:

- The report is specifically limited to the project described in Section 3.
- The report is based on the information provided by the team as listed above in Section 2.3.
- Whilst malicious acts or arson with respect to fire ignition and safety systems are limited in nature and are outside the objectives of the NCC, regardless they shall be considered as initiate events in this report. Malicious acts result in multiple fires or events in multiple locations at once are outside the scope of the assessment.
- This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee that ignition or a fire will not occur.
- The report is only applicable to the completed building for each of the relevant stages documented in Section 3.3. This report is not suitable, unless approved otherwise, each portion of the building in a staged handover or staged system/control commissioning.

- Where parties nominated in Section 2.2 have not been consulted or legislatively are not required to be, this report does not take into account, nor warrant, that fire safety requirements specific to their needs have been complied with.

3. Principal Building Characteristics

3.1 Overview

The proposed Data Centre is located at 10 Roberts Road, Eastern Creek, legally described as Lot 553 DP1110447. Offsite Enabling Infrastructure (OEI) is proposed across Lot 21 DP1246626, Lot 20 DP1157491, and Lot 22 DP1246626 to facilitate connection to TransGrid’s Sydney West Substation and Switchyard (refer to Figure 3-1). The site is located on Country of the Dharug people within the Blacktown Local Government Area and has a total land area of approximately 168,574 m².

The site forms part of the Eastern Creek Precinct Stage 3 within the Western Sydney Employment Area and is located approximately 35 km west of the Sydney Central Business District (CBD) and 5.1 km from Rooty Hill Train Station. The land is zoned IN1 General Industrial under Chapter 2 of the Western Sydney Employment Area within the State Environmental Planning Policy (Industry and Employment) 2021 (IESEPP). The proposed development is permissible with development consent in the IN1 zone in accordance with the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

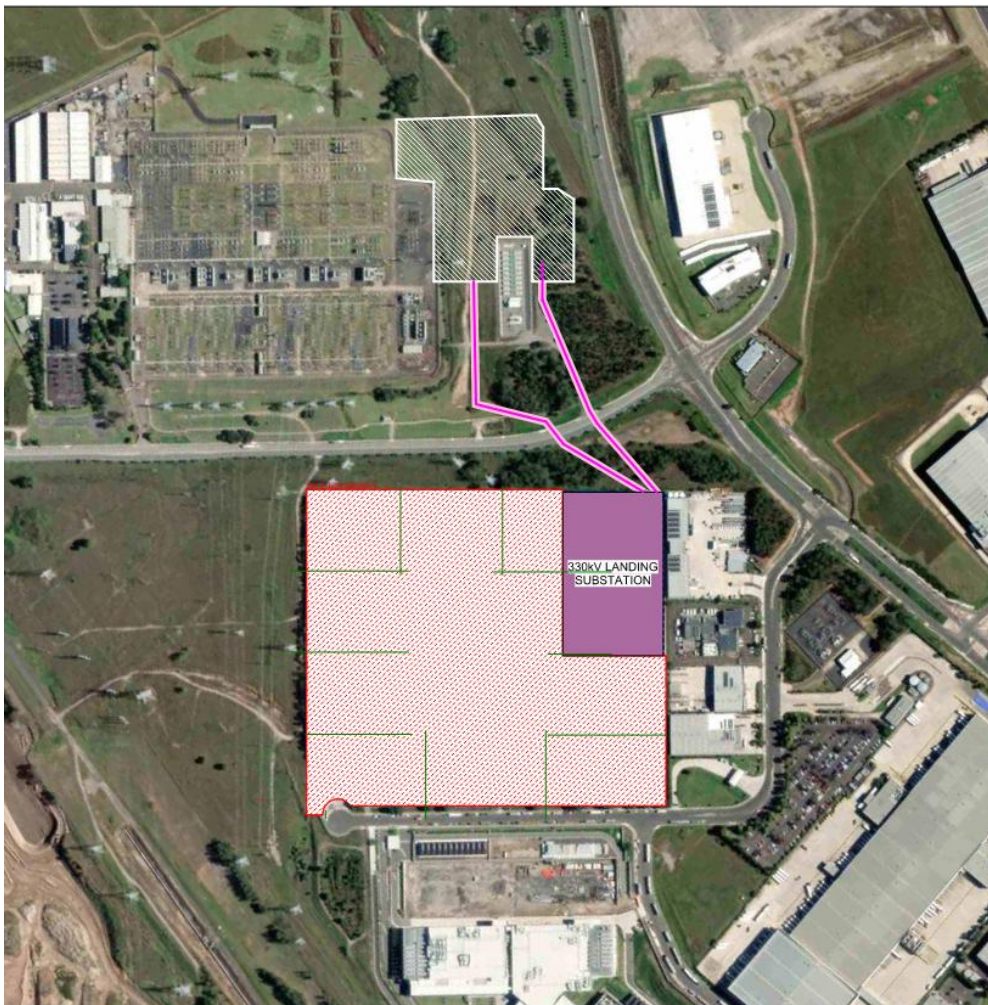


Figure 3-1: Site Location (NearMaps)

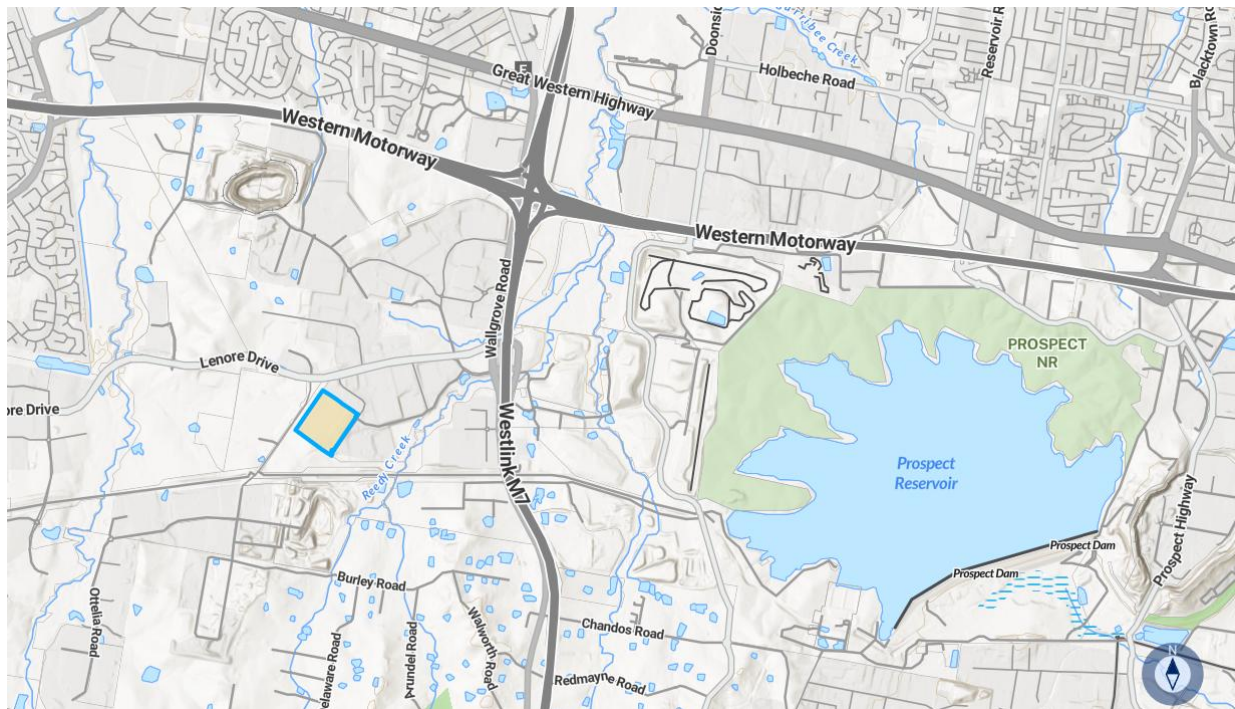


Figure 3-2: Cadastre Map (Source: NSW Explorer, 2025)

3.2 Site Layout

The proposed development is a campus site of 2 data centre buildings that will be active 24/7. The proposed Data Centre Campus consist of the following buildings:

- Building 1 – 3 Storey data centre building with 2 levels of data halls (5 halls per level)
- Building 2 – 4 Storey data centre building with 3 levels of data halls (7 halls per floor)
- High Voltage Substation

The location of the subject buildings is shown in Figure 3-3.

Each of the data centre building consists of the following level configuration:

- Ground Level - Data halls, loading dock, office/front of house areas, UPS battery rooms
- Level 1 - Data halls, office area, generator gantry
- Level 2 (Building 2 only) - Data halls, generator gantry
- Roof Level - Plant area, lift lobby.
- Roof Level - Plant area, lift lobby.

To ensure continuous operation, each data hall is supported by a robust redundancy architecture consisting of UPS battery rooms containing lithium-ion batteries and diesel backup generators. These generators are equipped with individual daily tanks, which are replenished by a centralised bulk fuel system. This fuel infrastructure, comprising 4.1 million litres (4,100,00 L) of diesel, is securely housed within external bulk fuel tank areas located between Building 1 and Building 2, providing the site with significant extended operational autonomy during a utility outage.

The proposed site is served by external substations to the northeast with 4 high voltage stepdown (330kV/33kV) transformers (4x175MVAV) containing insulating/cooling oil. Water infrastructure (tanks, pumps, etc) related to the mechanical operation of the data centre cooling is located between Building 1 and 2.

Additionally, through a ‘Dial Before You Dig’ enquiry, Jemena Gas Network Protection has confirmed that there is no gas assets located in or close by the site.

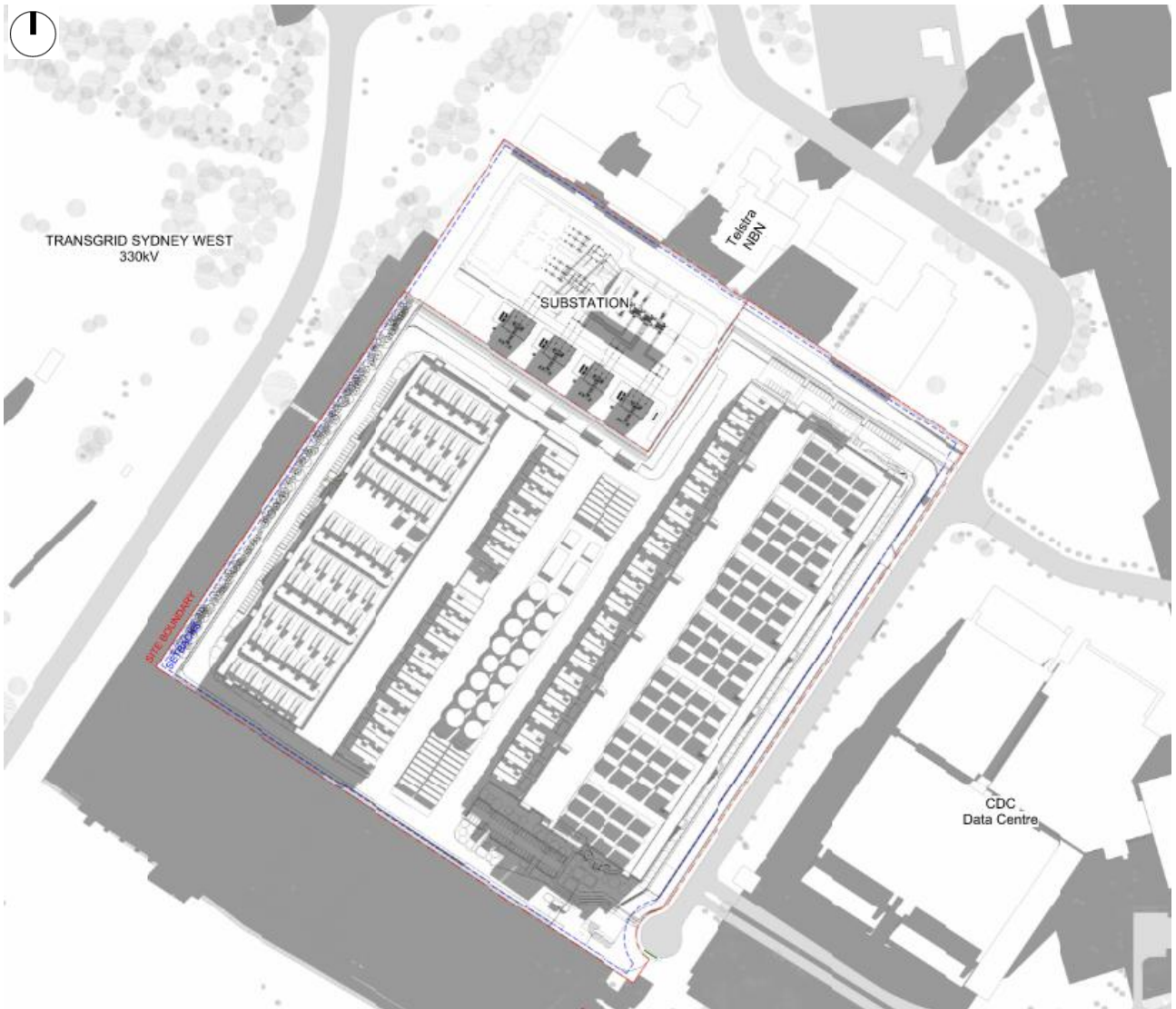
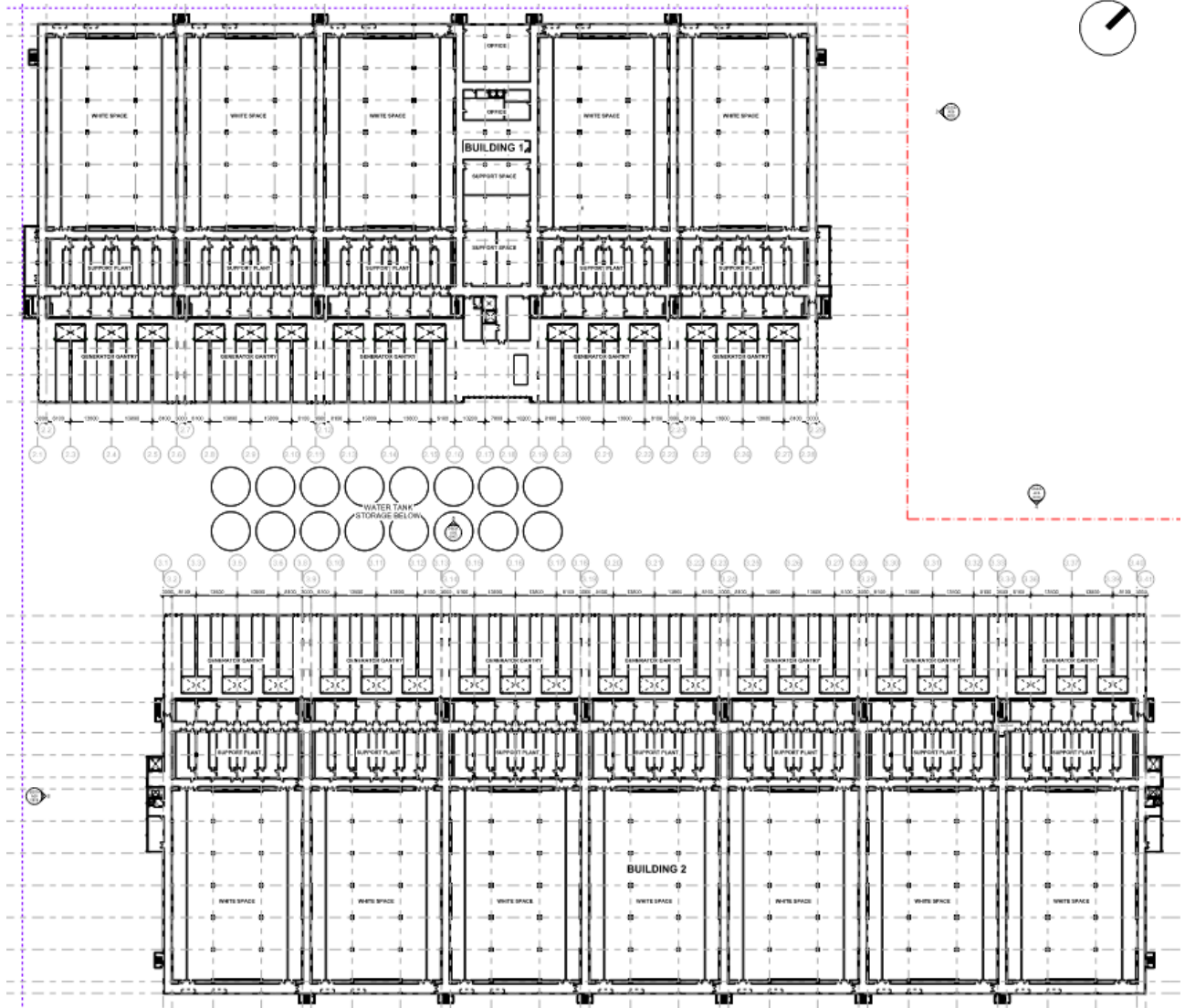


Figure 3-3: Site Plan



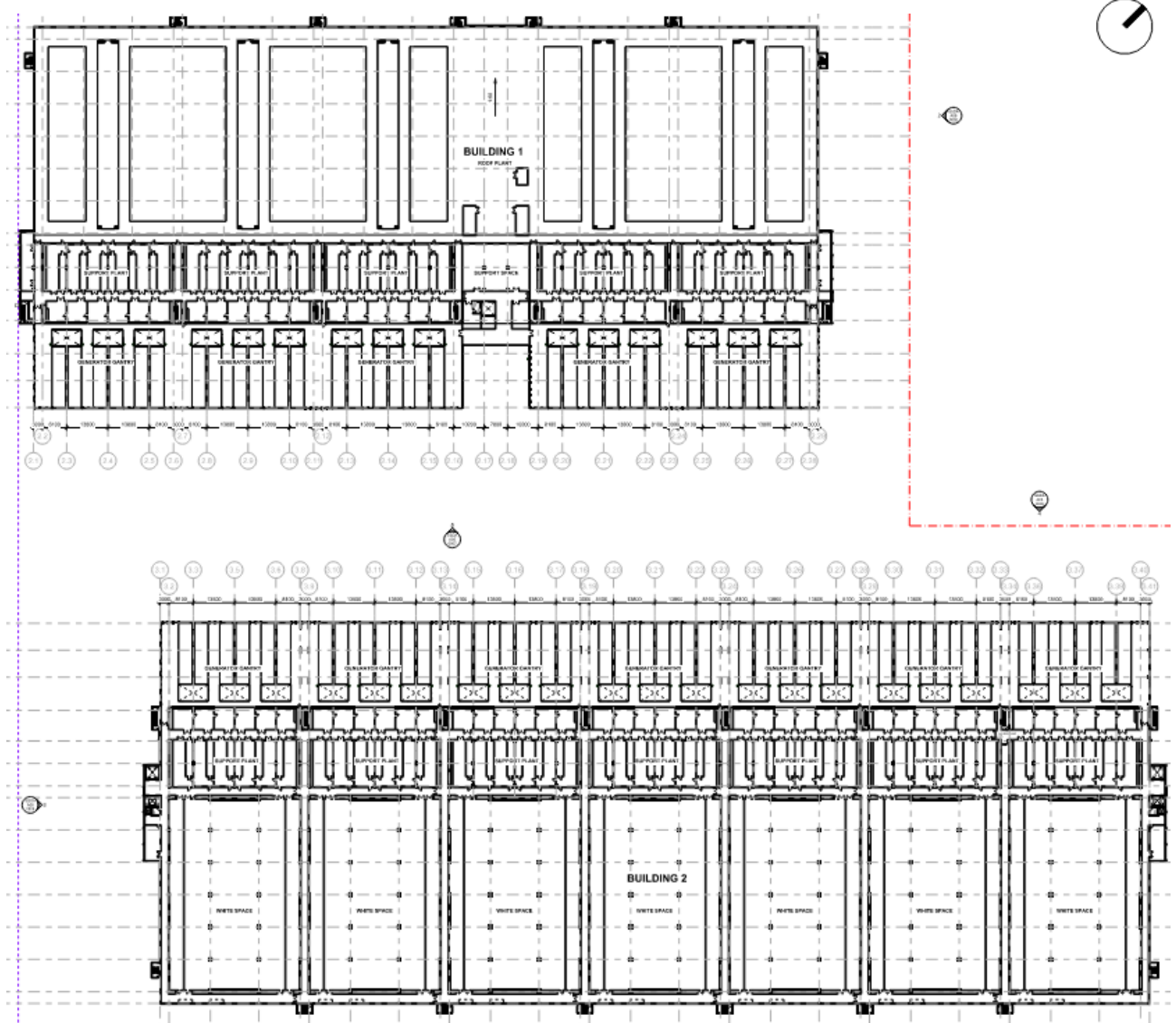


Figure 3-6: GA Floor Plan – Level 2

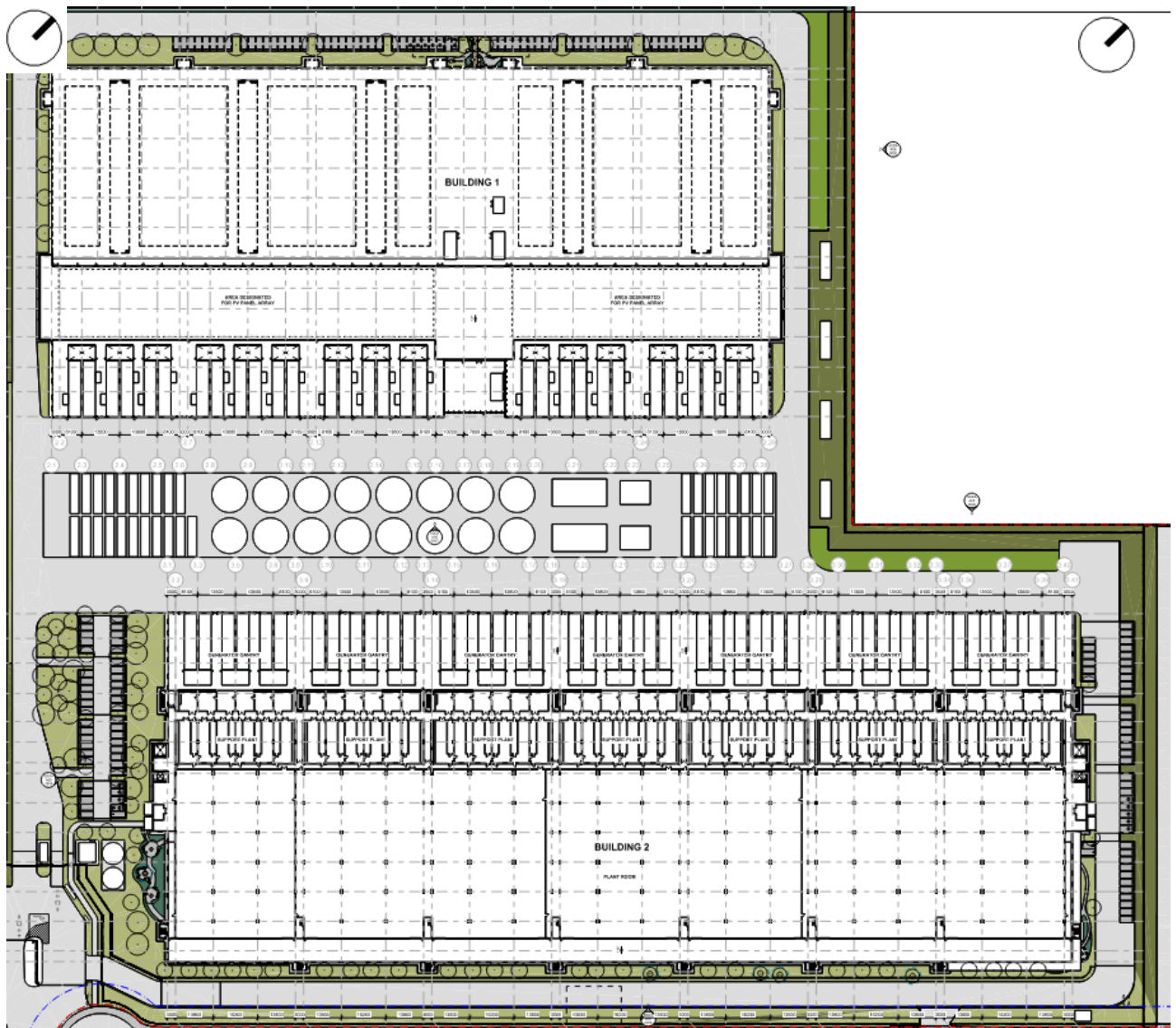


Figure 3-7: GA Floor Plan – Level 3

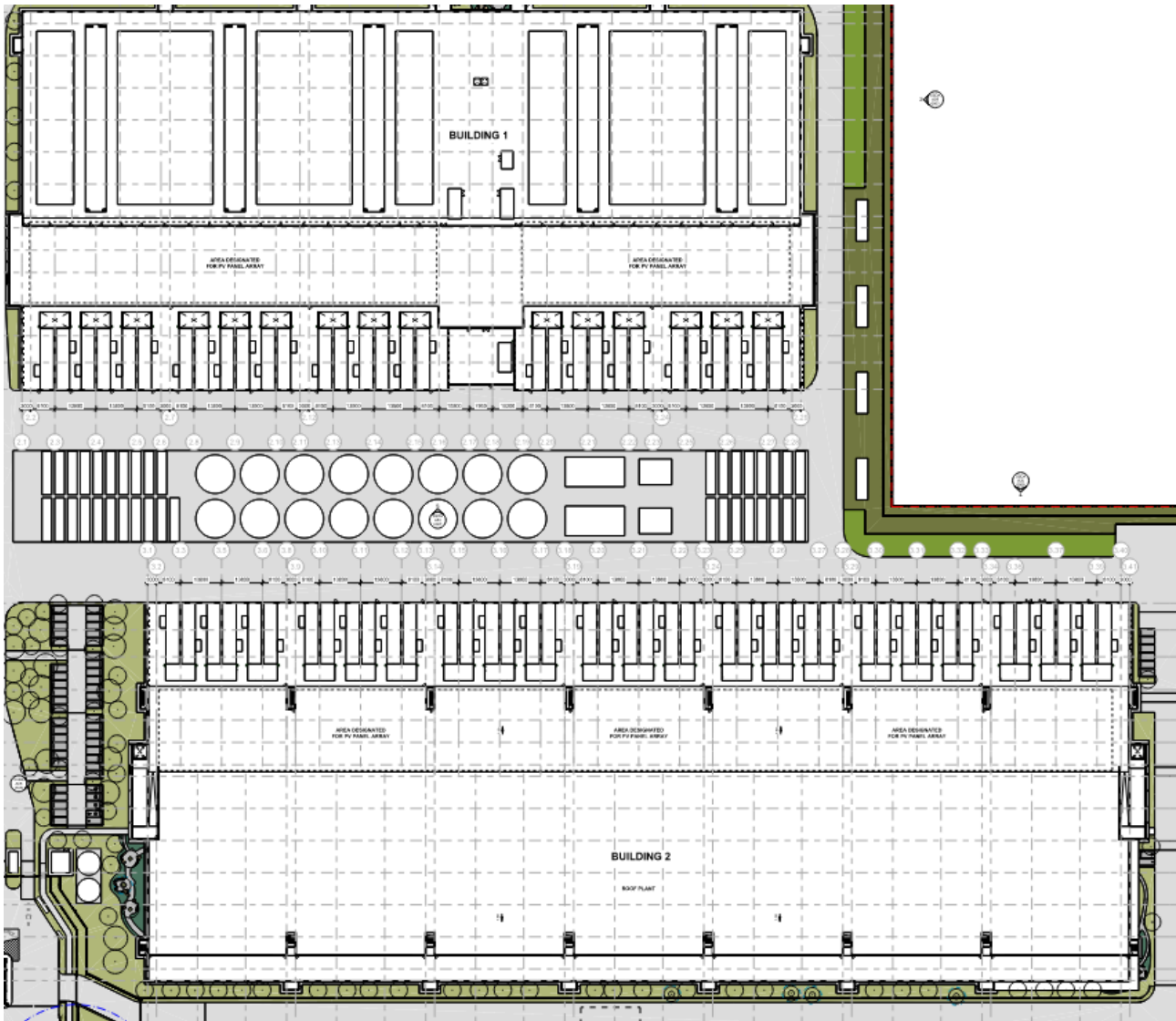


Figure 3-8: GA Floor Plan – Roof

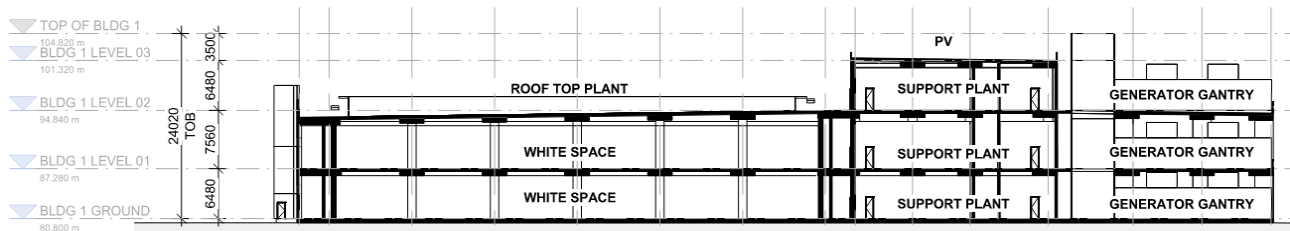


Figure 3-9: Section View – Building 1

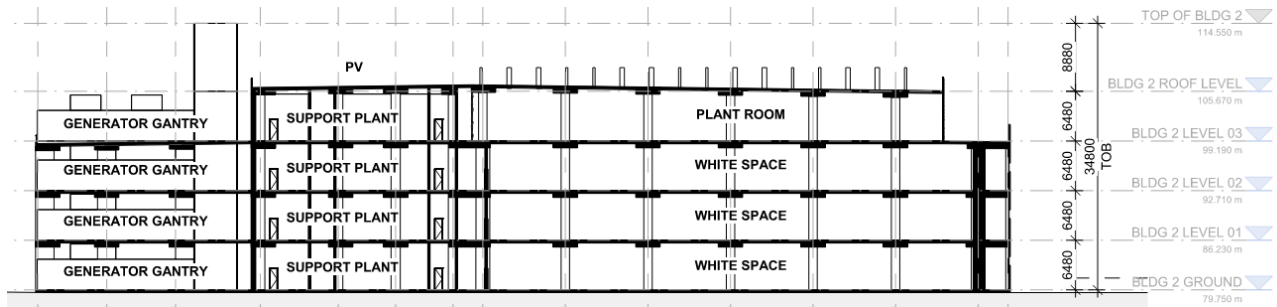


Figure 3-10: Section View – Building 2

3.3 Site Phasing

The site is proposed to be constructed in five (5) stages as per the below figure. Noting that this is preliminary and is subject to change as the design develops.

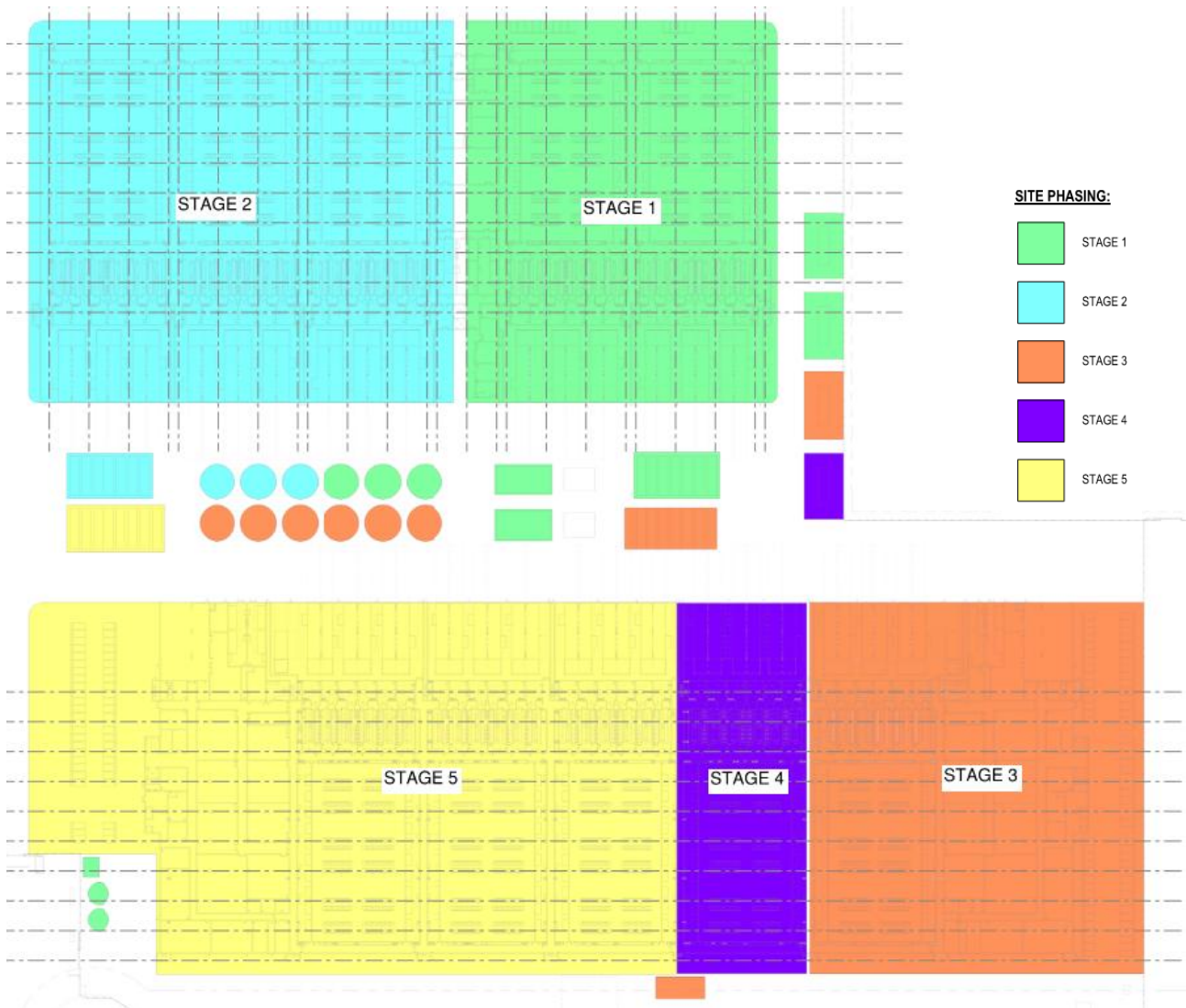


Figure 3-11: Site Staging plan

3.4 Sensitive Receivers

HIPAP assessments including PRS assessments typically use a desktop mapping study to identify ‘sensitive receivers’ which are intended to represent a selection of locations that may be susceptible.

The site has an area of approximately 17 hectares and is bounded by industrial development and has a primary frontage which is approximately 400 m to Roberts Road. The existing site contains an industrial warehouse and surrounding hard-stand areas. Surrounding land uses in the vicinity is summarised as below and shown in Figure 3-12.

- North and Northeast: A mix of industry and commercial developments, including several office buildings and cafes
- Northwest: Low density residential areas comprising detached houses, along with schools and churches
- Southeast: Data Centre and substation
- South: Class 7&8 buildings, transitioning to agricultural (farm) uses further south
- Southwest and west: land primarily owned and operated by TransGrid Sydney

The nearest sensitive receiver is Horsley Park Christian Church, located approximately 1 km south of the site. To the northwest, across Roper Road, are low-density residential buildings, Erskine Park High School, James Erskine Public School, and Christian Brethren Church, situated roughly 3–4 km from the site. These are considered more distant sensitive receivers.



Figure 3-12: Surrounding Land Use (Red: the site, Dark Blue: Class 7 & 8 buildings, Light Blue: Class 10 (Farms), Purple: Class 1 (Low density houses), Orange Circles: Class 9 buildings (Schools and Churches), Yellow Circles: Class 5 & 6 buildings (Office and Restaurant))

4. Operational Hazard Overview

4.1 Overview

The following tables (Table 4-1 and Table 4-3) will summarise the quantity and UN classes of the dangerous goods proposed to be located on the site.

Table 4-1: Overview of Quantity and Location of Dangerous Goods (Diesel and Batteries)

Equipment	Quantity	Mass Or Volume Per Item	Total Mass Or Volume Per Type	Total Mass Or Volume For The Site
Diesel Storage				
Diesel Generators and Day tanks	246	1,000 L	246,000 L	4,100,000 L
Bulk Diesel storage tanks – Internal	37	104,162 L	3,854,000 L	
Lithium-Ion Battery Storage				
Battery room (Containing Li-Ion Batteries)	249	12,025 kg	2,994,390 kg	2,994,390 kg
'In-rack UPS' (in data halls server racks)	N/A ¹	N/A ¹		

Table 4-2: Overview of Quantity and Location of Dangerous Goods (Transformer Oil)

Equipment	Quantity Per Sub-Parcel	Mass Or Volume Per Item	Total Mass or Volume for the Site
Located in Substation	64,447 L	4	257,788 L

Table 4-3: UN Classification Summary

Class	Un Packing Group	Description	Quantity
C1 ²	N/A ²	Diesel Fuel ²	4,100,000 L
9	N/A	Lithium Ion Battery	2,994,390 kg
C2 ³	N/A ³	Mineral Oil	257,788 L

Note1: It has been confirmed by the client that depending on the final customer for each data hall, specific halls or multiple halls may include the provision of 'in-rack' battery backup modules within the server racks. Where this is the case, these are installed in lieu of batteries within dedicated separate rooms. As such the total quantity of batteries present onsite is expected to be consistent regardless of the final configuration. The specific hazards associated with in-rack batteries shall still be considered as part of this report along with any required mitigation or control measures.

Note2: Diesel fuel has a range of flash points (52°C to 93°C) depending on its type and usage. This report is only valid for diesel fuel with a flash point of more than 60°C [1], which are typical of Diesel used for this type of generator operation.

Note3: As discussed in Section 4.4, the exact volume and specification of transformer oil has not yet been determined and therefore the worst-case oil type (mineral oil) has been selected. Estimated volumes are based on typical transformer of a similar power/capacity. As the oil's flash point (~140°C) is greater than 93°C, it is considered a Class

C2 combustible liquid in accordance with AS1940:2017. Mineral oil volume is based on an average density of 0.887 kg/L.

Other flammable/combustible goods

Given the nature of the facility, the quantity of stored combustibles other than those detailed above is inherently reduced in comparison to other industrial buildings. General building fuel loads including materials, linings and the like are considered by the NCC, and where required, the Fire Engineering Report. There is however expected to be a small quantity of additional combustibles and flammable materials stored within the building. It is noted that the quantity and nature of these materials are not considered a hazard that warrants an assessment against the Dangerous Goods Regulation.

- Small quantities of combustible materials used to aid in the daily operation of mobile plant equipment and processes (lubricant oils, paints, etc) which shall be kept within AS 1940 compliant flammable and combustible goods cabinets.
- It is expected that a forklift or powered pallet jack may be used in the loading dock area. This maybe in the form of propane powered or battery powered units.
- Wooden pallets and packaging associated with delivery of goods (server racks, etc) to the site are expected to be temporarily located across the site, including the loading dock, prior to disposal.
- Where other items, such as chemicals for wastewater treatment, or ammonia or other refrigerants for cooling systems are identified during the subsequent design process this shall be assessed at that time. It has been noted by the client that they are expecting to be adopted R134A or R513A refrigerants only (A1 safety classification).

4.2 Diesel

The site's diesel storage is proposed to be comprised of external bulk storage tanks and day tanks located within the generator enclosures. The majority of the fuel is stored in the bulk tanks, which is then used to feed the day tanks which provide the short-term fuel for each generator set operation. The bulk storage is located between Building 1 and 2 (refer Figure 4-1). It is not yet known if the tanks will be buried ('below ground tanks) or on-grade. Noting that layout shown is indicative at this stage, and is understood that 37 tanks are to be provided in same parallel arrangement. The day tanks are used for the general running of the generators and are filled by the bulk tanks utilising fixed pumping infrastructure. Individual day tanks are integrated within each generator enclosure to provide immediate fuel access. For Building 1, these units are distributed from the ground floor through Level 2, while Building 2 features a similar configuration extending from the ground floor up to Level 3. (see Figure 4-2).

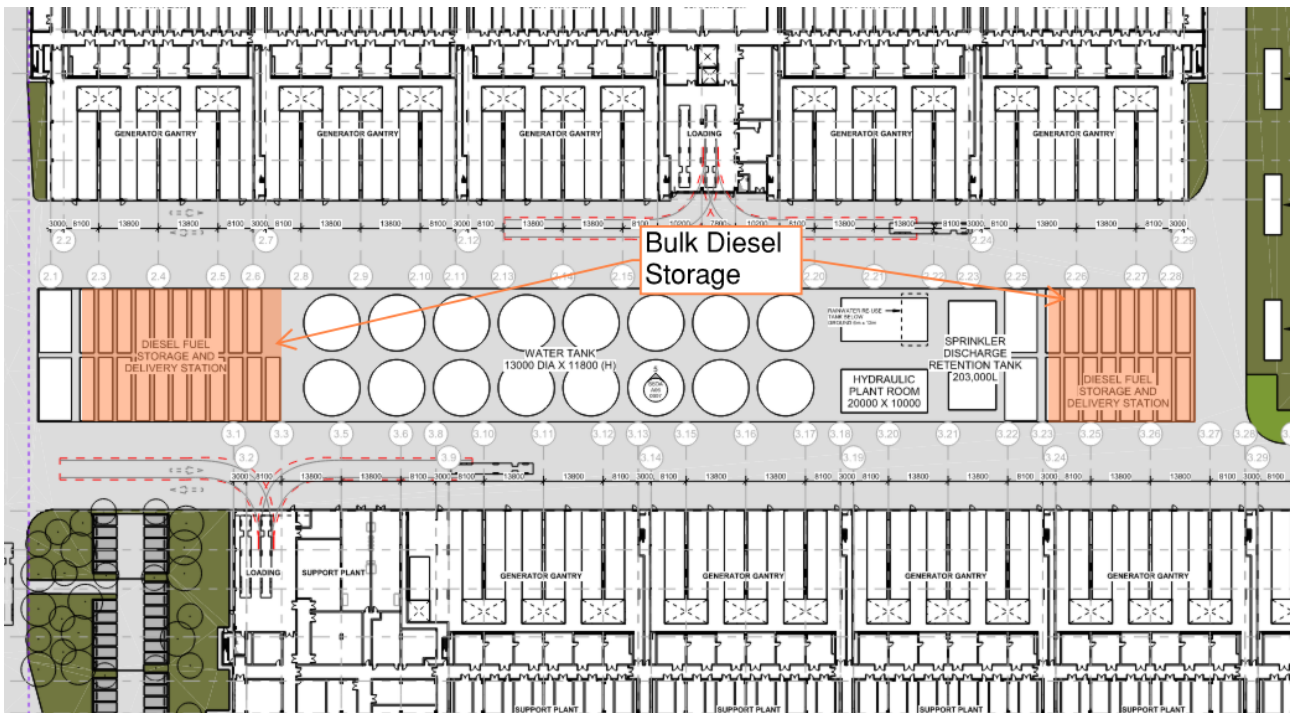


Figure 4-1: Location of Bulk Storage tanks – on Ground Floor between Building 1 and 2

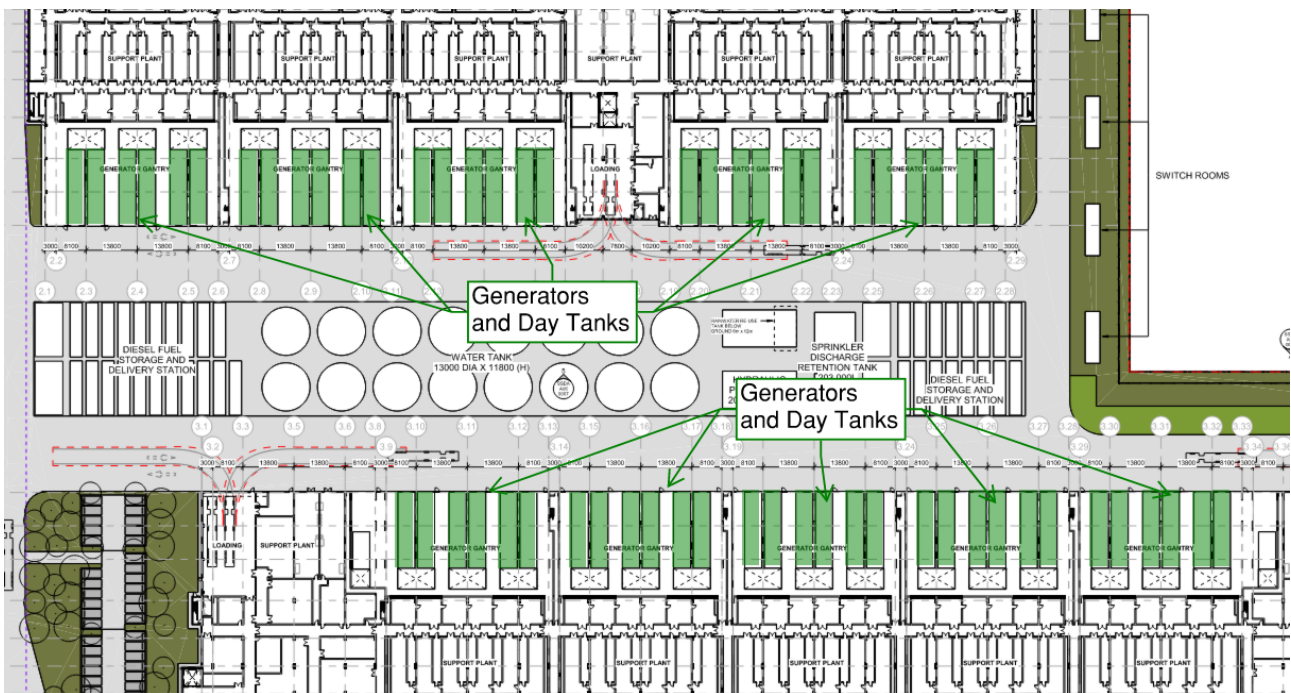


Figure 4-2: Location of Generators and Day Tanks (Ground Floor)

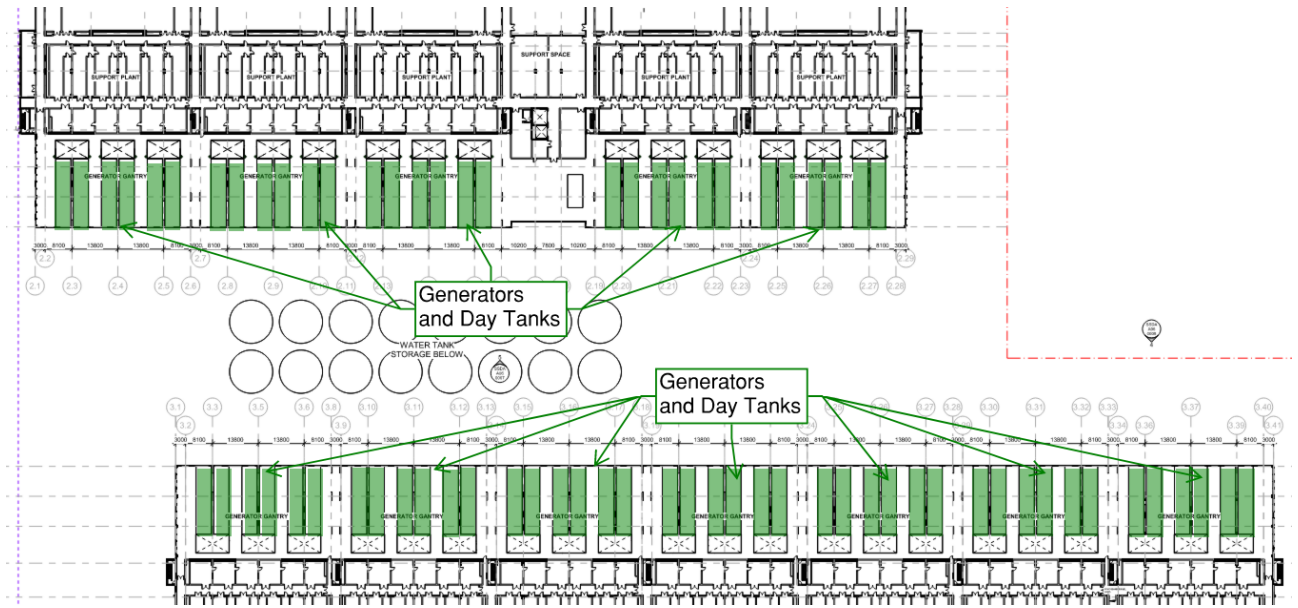


Figure 4-3: Location of Generators and Day Tanks (L1&2)

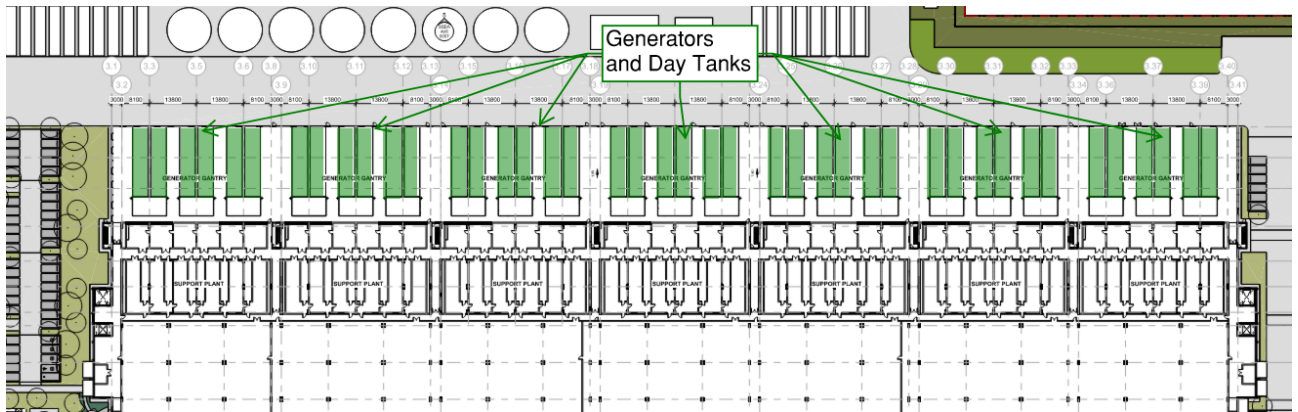


Figure 4-4: Location of Generators and Day Tanks (L3)

The total storage of the combined tanks is shown below in Table 4-4.

Table 4-4: Summary of Diesel Storage Locations

Storage Location	Volume Per Unit	# Of Units	Total Volume
Bulk tanks	104,162 L	37	3,854,000 L
Day tanks	1,000 L	246	246,000 L

4.3 Lithium-Ion batteries

Data centres have multiple standard deployments for the battery backup systems, the most common being either battery rooms, or having UPS systems in the data halls within the server racks ('in-racks'), or a combination of the two. As discussed previously it has been confirmed by the client that depending on the final customer for each data hall, specific halls or multiple halls may include the provision of 'in-rack' battery backup modules within the server racks. Where this is the case, these are installed in lieu of battery systems within dedicated separate rooms. As such the total quantity of batteries present onsite is expected to be generally consistent regardless of the final configuration.

Consideration of the specific hazards associated with both in-rack batteries and battery rooms shall be considered as part of this report along with any required mitigation or control measures. The location of batteries in the battery room configuration is shown below in Figure 4-5.

Additional batteries not in use shall be stored within battery storage rooms within the site, these are for replacement batteries before they are installed and batteries that have been replaced and are waiting to be removed from the site. Note these quantities are considered negligible in comparison to the total site quantities.

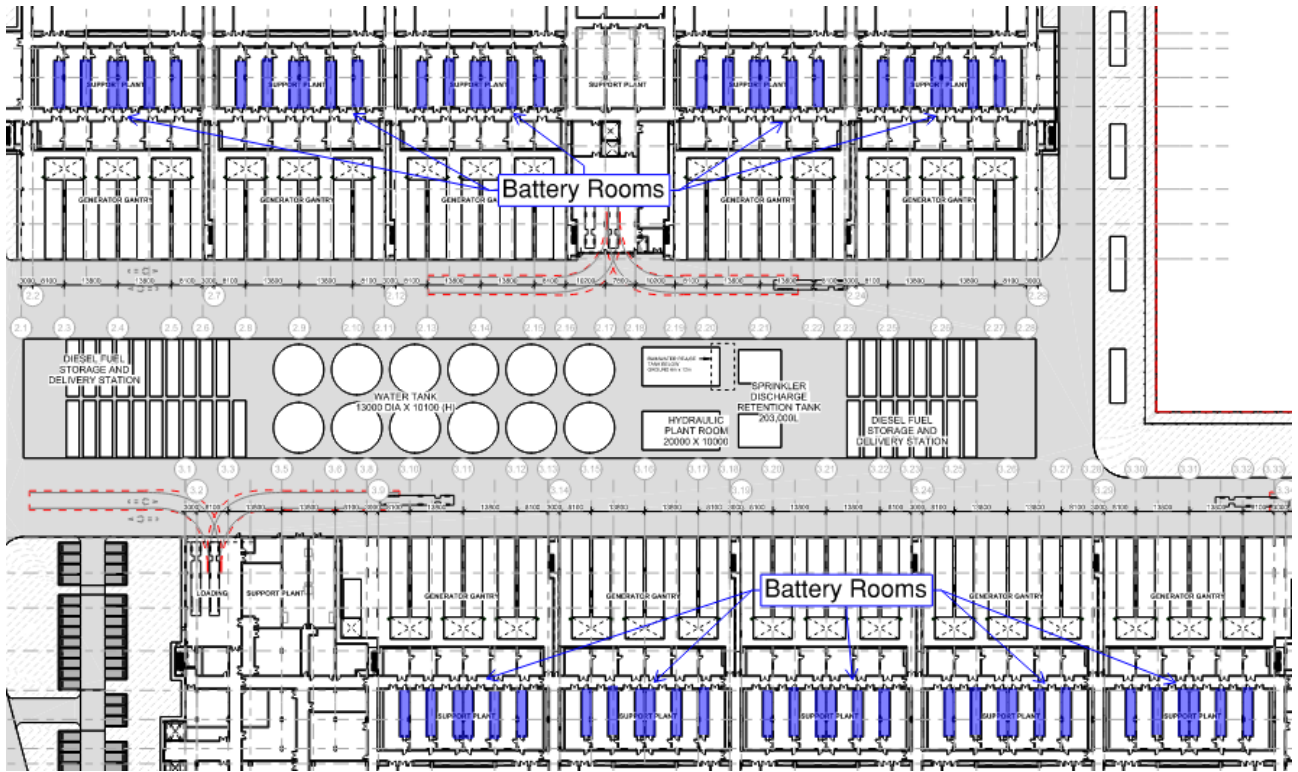


Figure 4-5: Battery Rooms Locations on Ground Floor

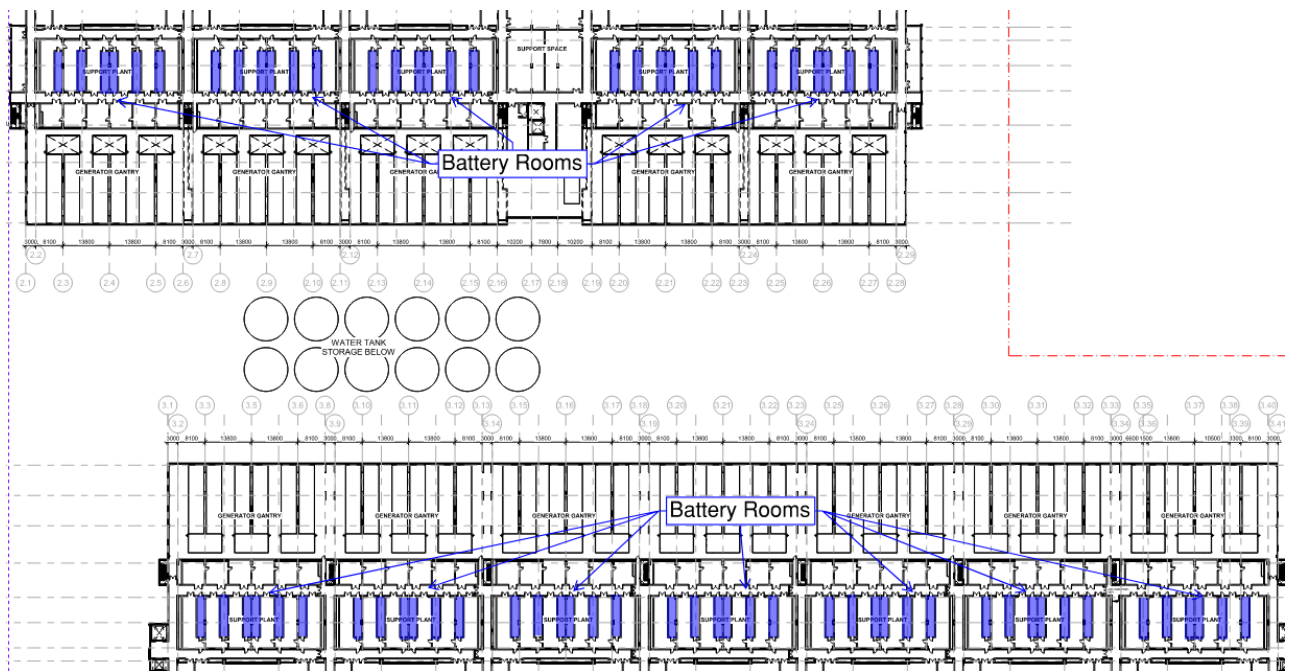


Figure 4-6: Battery Rooms Locations on L1&2

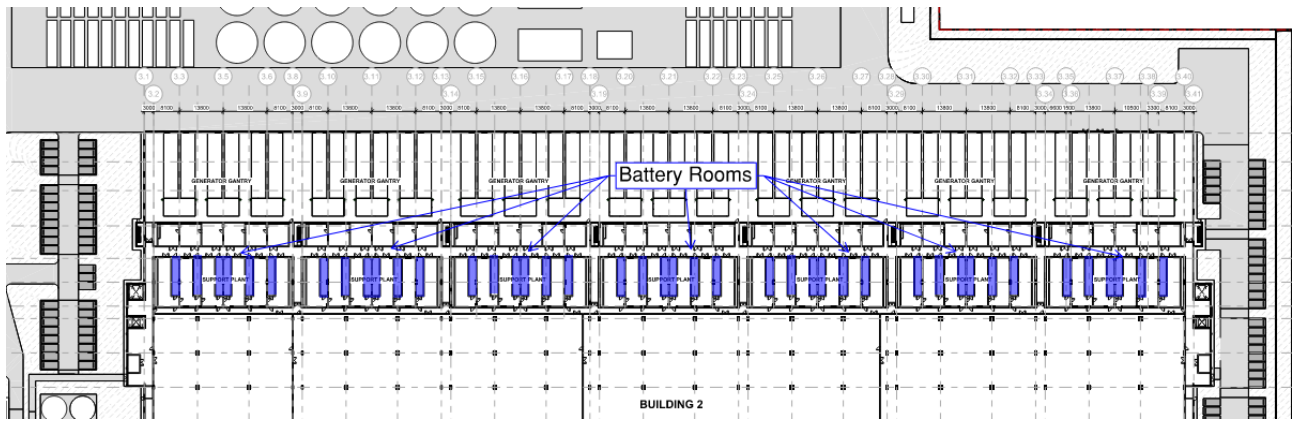


Figure 4-7: Battery Rooms Locations on L3

4.4 Transformer Oil (HVSS)

The substation is currently proposed to be designed and constructed as part of separate package by another design team, so the exact detail and specification of the proposed transformers is not known at this stage. Regardless, it is expected that the HV transformers in the substation will contain non-chlorinated heat transmission (cooling) and insulating oils. Whilst not classified as a dangerous good, research in the field indicates the oil-filled transformers still pose a fire hazard. *Wang (2018) and Martin et al. (2019) summarized and analyzed the existing studies and asserted that fires in large oil-filled transformers could occur due to six main causes—poor transformer quality, internal overvoltage and overcurrent triggering arc faults, core insulation damage, internal short-circuiting or overloading, deterioration of oil quality and heat dissipation capacity, and natural disasters due to lightning strikes [13].*

Mineral oil, natural ester fluid and silicone are the three most common fluids used in transformers. Among these three oils, mineral oil has the most hazardous properties as it has the lowest flash point (approximately 140°C). As a general rule the client and operator prefers ester oil insulated transformer (k-type as per AS2067) which permit shorter clearances to other transformers or equipment than transformers with conventional mineral oil (as per Table 6.1 in AS2067 (Table 2) due to lower flammability. Therefore, mineral oil, is conservatively selected as the proposed transformer oil here. As the oil’s flash point (~140°C) is greater than 93°C, it is considered a Class C2 combustible liquid in accordance with AS1940:2017.

Whilst still in design development, it is understood that the proposed substation will contain 4 x 330/33 kV, 175 MVA transformers. Each transformer is expected to contain ~64.5 t of oil. Noting that transformers models have not been confirmed in this concept design, these values are based of reference transformers for the same capacity and voltage, as such these values are approximate. During the subsequent design phases when a specific make and model of transformer have been determined these volumes shall be updated to reflect the final proposed design.

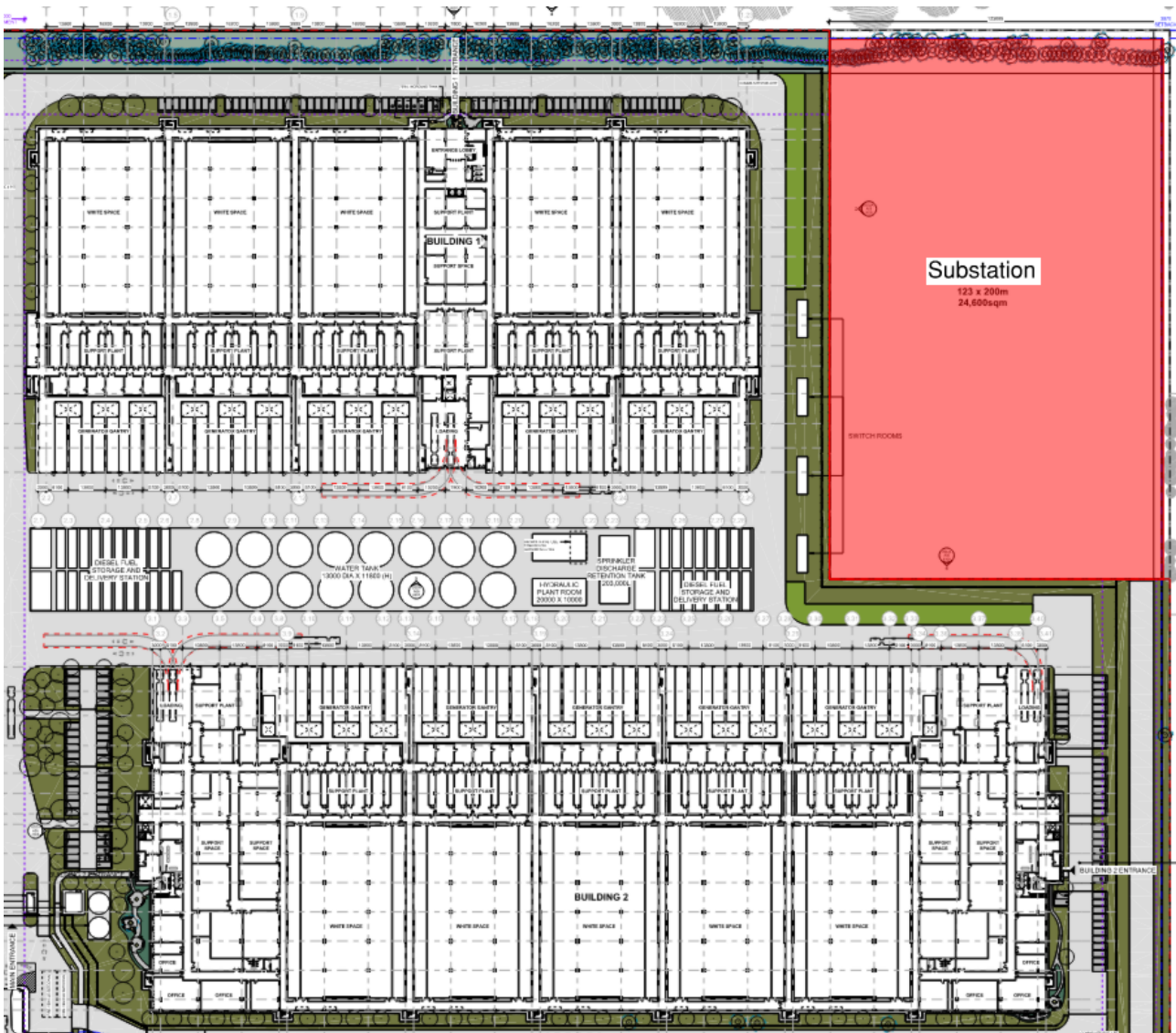


Figure 4-8: HV Transformers Locations

The total volume of HVSS oil stored on site is shown below in Table 4-5

Table 4-5: Summary of HVSS Oil

Storage Location	Volume Per Transformer	# Transforers	Total Volume
175 MVA transformer casing	64,447 L	4	257,788 L

5. Preliminary Risk Screening

5.1 Dangerous Goods

Through the Planning Secretary’s Environmental Assessment Requirements for data storage centres, requirement ‘16. Hazards and Risks’ requires the use of State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP 33) to perform the preliminary risk screening assessment for development. SEPP 33 outlines how to perform a preliminary risk screening for dangerous goods within a development, however, Table 1: *Screening method to be used*, does not identify a method for Class C1, C2 or Class 9 dangerous goods. As such, applying the SEPP 33 guideline identifies no requirement for additional risk screening for the development based on the proposed dangerous goods within. Notwithstanding the above Appendix 7 of SEPP 33 outlines threshold quantities that trigger the requirement to notify WorkCover NSW (now SafeWork NSW) and develop a manifest and emergency plan, Table 5-1 below outlines the proposed quantities of the site compared to these threshold values. A manifest shall be developed as per Safe Work Australia “Manifest Requirements for Hazardous Chemicals [11].

Table 5-1: Comparison of Proposed Quantities to WorkCover NSW Notification Values

Dangerous Good	Maximum Quantity On Site	Threshold Quantity Trigger
Diesel Fuel	4,100,000 L	100,000 L
Lithium-Ion Batteries	2,994,390 kg	10,000 kg
Transformer Oil	257,788 L	N/A

Note: As proposed transformer oil is not considered a DG under the guideline, it is not in the scope of the SEPP 33

Additionally, although Part 7.1 of the Work Health and Safety Regulation 2025 (WHSR 2025) on the handling and storage of hazardous chemicals at a workplace is directed at a person conducting business within the building, the building must be constructed in such a way that allows the person conducting business to be able to follow the requirements outlined. The Regulation contains threshold, placarding and manifest quantities each triggering additional requirements, as such this PRS shall compare the proposed DG’s and WHSR values to determine if additional requirements are relevant to this site, as shown below in Table 5-2.

Table 5-2: Comparison of proposed quantities to WHSR values [12]

Dangerous Good	Maximum Quantity On Site	Threshold Quantity Trigger	Placarding Quantity Trigger	Manifest Quantity Trigger
Diesel Fuel	4,100,000 L	1,000 L	N/A ¹	N/A ¹
Lithium-Ion Batteries	2,994,390 kg	100 kg	N/A ¹	N/A ¹
Transformer Oil	257,788 L	N/A ¹	N/A ¹	N/A ¹

Note 1. Neither Class C1, C2 or Class 9 goods are not considered to be DGs as per WHSR

Based on the above table the site’s proposed quantities of Dangerous Goods exceed the threshold value, therefore some additional requirements under the Regulation are triggered. The relevant requirements to the development are summarised below in Table 5-3:

Table 5-3: Summary of Work Health and Safety Regulation 2025 Requirements [12]

Section #	Item	Requirements*
341, 342, 343	Labelling hazardous chemicals	A person conduction business must ensure that the hazardous chemical, storage container and its pipe work is labelled in accordance with Section 335
344, 345	Safety Data Sheets	A person conduction business must obtain a current safety data sheet for the hazardous chemicals on site

346	Hazardous Chemical Register	A person conducting business must ensure that a maintained hazardous chemical register is kept at the site
Division 5 Subdivision 1 351-556	Control of Risk	A person conducting business must undertake and manage dangerous goods in accordance with part 3.1, and all implemented controls are reviewed as per 352. A person conducting business must display safety signs at the workplace. Additionally they must identify additional risk due to the dangerous chemicals, including those risks related to fire, explosion or creating unstable chemicals
357, 358	Spills and Damage	Where there is a possibility of spillage of a dangerous chemical, a containment system which does not create a hazard in itself. Additionally, so far as is reasonably practical, containers, pipe work, and associated attachments are protected against damage caused by impact or excessive load.
Subdivision 3 359, 360, 362	Emergency Plans and safety equipment	A person conducting business must ensure the following is provided to the building: Fire protection and firefighting equipment that is designed and built for the type of hazardous chemicals at the workplace Equipment for use in an emergency Safety equipment relevant to any risk identified in relation to the hazardous materials on site, must be provided, maintained and accessible
Subdivision 4 363-	Storage and handling	A person conducting business must ensure that equipment used in the handling or storage of hazardous materials is used for the purpose it was designed and is correctly operated, tested and maintained. Containers used for the storage of hazardous chemicals must be installed as per 364 All equipment or storage containers that are stopping use or being disposed must be done so as per 365, 366 or 367
Divisions 6, 7 and 8	Health Monitoring Induction, information, training and supervision Prohibition, authorisation and restricted use	These subdivisions relate to workers conditions training and welfare are outside the considerations of this report.'

***Note:** Table 5-3 provides only a summary of the additional requirements triggered by exceeding the threshold quantities, refer to Work Health and Regulation 2025 [12] for the exact requirements and general operating requirements.

5.2 Pipeline Corridor

In Planning Secretary’s Environmental Assessment Requirements – Data storage centres, it is stated that if the development is adjacent to or on land in a pipeline corridor, then consultation with the operator of the pipeline and a hazard analysis must be undertaken. Noting that assessment of this item is not a requirement in the project specific SEARs.

The State Environmental Planning Policy (Infrastructure) 2007 states that a gas corridor is any land within the licence area of a gas pipeline licensed under the Pipelines Act 1967, or within 20m (measured radially) of the centreline of any of the following gas pipelines

- (i) Central West Pipeline System and Central Ranges Pipeline System,
- (ii) Eastern Gas Pipeline,

- (iii) Moomba to Sydney Pipeline System,
- (iv) Wilton to Newcastle Pipeline,
- (v) Wilton to Wollongong Pipeline,
- (vi) Culcairn to Victoria Interconnect Pipeline,
- (vii) Hoskinstown to Australian Capital Territory Pipeline.

Through a dial before you dig enquiry it was found that none of the above are located on or adjacent to site (refer Appendix A).

5.3 Bushfire Land Classification

Based on a search of the NSW Rural Fire Service (RFS) – ‘Bush fire prone land tool’, the site is currently designated as being within a designated bush fire prone area. As such a Bushfire Hazard Assessment report has been prepared by BlackAsh Bush Fire Consulting.

Table 5-4: Determination of Bushfire Construction Standards applicable.

Direction	Slope	Vegetation	APZ Proposed	Bushfire Attack Lev
Northeast	NA	No hazard	NA	Figure 5-1
Southeast	NA	No hazard	NA	
Southwest	0-5° downslope	Grassland	>15 metres	
Northwest	Slope	No hazard	NA	



Figure 5-1: Bushfire attack level – BlackAsh Report (Figure 7 from the report).

As it pertains to the hazardous goods proposed to be stored onsite, the bulk diesel tanks and the battery rooms/data halls of Building A all fall within a BAL region. The substation to the north of the site is outside of the BAL ratings.

The report concludes that the following strategies are appropriate to address the aim and objectives of Planning for Bushfire Protection 2019:

- Recommendation 1: At the commencement of building works and in perpetuity, the site shall be maintained as an Asset Protection Zone. The APZ shall be established and maintained as an inner protection area as outlined within Planning for Bushfire Protection 2019 and the NSW RFS document ‘Standards for Asset Protection Zones’.
- Recommendation 2: Fire hydrants are provided in accordance with Building Code of Australia E1.3, AS2419.1:2005, including the ring main requirements for large, isolated buildings and those identified in Section 9.
- Recommendation 3: The part of buildings affected by BAL (Figure 7) is to be constructed to comply with the National Construction Code (2019), Australian Standard AS 3959:2018, Construction of buildings in bush fire-prone areas and/or NASH Standard (1.7.14 updated), National Standard Steel Framed Construction in Bushfire

Areas – 2014, and Section 7.5 of Planning for Bush Fire Protection 2019 on a prescriptive (deemed to satisfy and/or acceptable solution) basis and/or performance basis to the extent depicted in Figure 7.

- Recommendation 4: All proposed roads within the site must comply with section 5.3.2 of Planning for Bush Fire Protection 2019 as appropriate.
- Recommendation 5: Diesel fuel storage infrastructure, including tanks, interconnecting pipework, and associated fittings such as valves, must incorporate fail-safe automatic containment and isolation mechanisms to prevent and contain any fuel spill or release. Regular inspection, maintenance, and testing of all diesel storage infrastructure and containment systems must be undertaken in accordance with AS1940. A site-specific Emergency Response Plan must be prepared and implemented, outlining procedures for bushfire, spill, and other emergency events. Comprehensive spill and leak prevention, management, and response measures must be implemented and periodically reviewed to ensure ongoing effectiveness.

The report then concluded ‘Based on the bushfire hazard assessment of the site and surrounding land, including the mapped Category 3 vegetation to the south-west and associated buffer extending into the site, the proposal is considered capable of achieving an acceptable bushfire risk outcome consistent with the aim and objectives of Planning for Bush Fire Protection 2019 (PBP 2019) for “Other” development, subject to implementation and ongoing maintenance of the nominated bushfire protection measures.’ Whilst this bushfire rating does not impact the Preliminary Risk Screen and the associated outcome of the SEPP33 assessment, it shall be carried forward as an initiating event in the Preliminary Hazard Analysis.

5.4 Protection of the Environment Operations Act 1997 No 156

The Protection of the Environment Operations Act 1997 No 156 requires under Part 3.2 that for schedule development work and scheduled activities under Schedule 1, an EPA license will be required. Whilst Schedule 1 contains a range of activities, as per the scope of this report, only the items relevant to the storage of hazardous goods proposed on site shall be considered. As such the proposed quantity of stored goods on site shall be compared to values outline within Section 9: Chemical Storage.

Table 5-5: Comparison of proposed quantities to PotEOPA [9]

Dangerous Good	Maximum Quantity On Site	Threshold Quantity Trigger
Diesel Fuel	4,100,000 L	2,000,000 kg (petroleum products storage)
Lithium-Ion Batteries	2,994,390 kg	2,000,000 kg (general chemicals storage)
Transformer Oil	257,788 L	N/A ¹

Note 1: Schedule 1 activities for chemical storage are limited to chemical substances classified as a dangerous good in the Transport of Dangerous Goods Code, as such the clause does not apply to transformer oil.

As shown in Table 5-2 the proposed diesel fuel and Lithium-Lon batteries storage exceeds the Schedule 1 quantities under the Act, and as such an EPA license will be required for the site.

5.5 Preliminary Risk Screening Conclusions

The dangerous goods storage for the site exceeds Appendix 7’s threshold values in SEPP 33 and Part 7.1’s threshold Quantities of Dangerous Goods of the Work Health and Regulation 2025. Therefore, the Regulatory requirements are triggered for SafeWork notification, a dangerous goods manifest, and the WHSR requirements outlined above. Additionally, as the proposed diesel fuel and battery storage exceeds the Schedule 1 quantities in PotEOPA, an EPA license will be required for the site.

Although SEPP 33 does not prescriptively require a PHA for this site as the dangerous goods proposed are not considered in its scope. It is considered for a conservative approach to perform a PHA to identify risks applicable to the site and propose mitigating controls to those risk that are considered outside of acceptable levels.

6. Preliminary Hazard Analysis

6.1 Outline of Method

Given the presence of dangerous goods on this site, there are heightened risks compared to a site without such materials. To best understand and control these risks, a hazard analysis in the form of a risk assessment has been undertaken.

To facilitate this assessment HIPAP 4 and 6 frameworks have been used to develop an understanding of the risks that occur through the storage and use of dangerous goods on this site.

HIPAP 6 provides an explanation of the elements of a hazard analysis (shown in Figure 1-1). The following steps are followed to create the risk assessment:

- Scenario identification
- Preliminary risk assessment – risk with no controls implemented
- Recommendation of controls
- Revised risk assessment
- If this risk assessment shows the risk to be at an unacceptable level after implementing mitigating controls, then additional solutions must be developed.

Using the risk matrix shown below, the most significant risks have been identified and prioritised. This prioritisation allows for the implementing of appropriate safeguards to mitigate these risks effectively and ensure the safety of the site.

HIPAP 4 states the following in regard to qualitative risk criteria *“Irrespective of the numerical value of any risk criteria level for risk assessment purposes, it is essential that certain qualitative principles be adopted concerning the land use safety acceptability of development.”*

The guidelines also states the following criteria as appropriate when assessing the risk of a development project of a potentially hazardous nature:

- Avoidable risks are avoided, i.e. alternative technologies or locations
- Reduction of risks from major hazards shall be reduced wherever practical, when the outcome of the risks are severe in regards to occupants or environment all feasible measures should be adopted
- The consequences of more likely risks, wherever possible, are contained within the boundaries of the installation.
- Where existing high hazard developments exist, new developments shall not add to the existing risk

After the identification of each scenario, the likelihood of the risk and the severity of the consequences are estimated using the Table 6-1 and Table 6-2 below. The following levels of likelihood, consequences and risk matrix are from *Guide for major hazard facilities – Safety assessment* from Safe Work Australia [9]. Note, the risk assessment criteria were developed during the ‘Establish the Context’ phase of the Risk Management Process (Section 1.3.2) in accordance with AS/NZS ISO 31000:2009. In accordance with AS/NZS ISO 31000:2009, Table 6-1 to Table 6-4 were reviewed by the stakeholder team (Section 2.2) and were considered to be consistent with the specific objectives and context of this PHA.

Table 6-1: Likelihood of Occurrence [9]

Descriptor	Description
Almost certain	Is expected to occur
Likely	Will probably occur
Possible	Could occur
Unlikely	Could occur but not anticipated
Rare	Exceeding circumstances required to occur

Table 6-2: Qualitive Consequences [9]

Descriptor	Impact To People	Impact To Environment	Impact To Assets
Catastrophic	Multiple fatalities	Widespread severe environmental impact	Damage to entire building.
Major	Permanent impact on health or singular fatality	Widespread substantial environmental damage or small-scale severe damage	Damage to an entire data hall.
Moderate	Major impact on health or significant injury	Substantial damage over a small scale	Damage to a row of server cabinets.
Minor	Minor injury or health effects	Moderate small-scale environmental damage	Damage to singular rack.
Insignificant	Quickly treatable minimal injury or health effects	Minimal environmental impact	Damage to singular shelf in a rack

The table below will help rate the risks of the building (Table 6-3).

Table 6-3: Risk Matrix [9]

Likelihood	Risk Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Certain to occur	Significant risk	Significant risk	High risk	High risk	High risk
Very Likely	Moderate risk	Significant risk	High risk	High risk	High risk
Possible	Low risk	Moderate risk	Significant risk	High risk	High risk
Unlikely	Low risk	Low risk	Moderate risk	Significant risk	High risk
Rare	Low risk	Low risk	Moderate risk	Significant risk	High risk

Using the tables above, risks can be categorized for the site into four levels of severity: **High, Significant, Moderate, and Low.**

Linking the above risk assessment to the HIPAP 4 [6] methodology, it is recommended that the “As low as reasonably practicable” (ALARP) approach is adopted. This approach is made to ensure that the highest societal risks of a project are not permitted, and manageable risks are considered and appropriately mitigated or controlled to reduce them as close as possible to negligible. The approach has three levels of risk ‘Intolerable, ALARP and negligible’ (Figure 6-1).

As detailed in the HIPAP, ALARP has been described by the UK Health and Safety Executive (HSE) in the following terms: *‘In weighing the costs of extra safety measures the principle of reasonable practicability (ALARP) applies in such a way that the higher or more unacceptable a risk is, the more, proportionately, an employer is expected to spend to reduce it’.* [6].

As shown in Figure 6-1 and detailed in the HIPAP [6] *‘Below the negligible line, provided other individual criteria are met, societal risk is not considered significant. Above the intolerable level, an activity is considered undesirable, even if individual risk criteria are met. Within the ALARP region, the emphasis is on reducing risks as far as possible towards the negligible line.’*

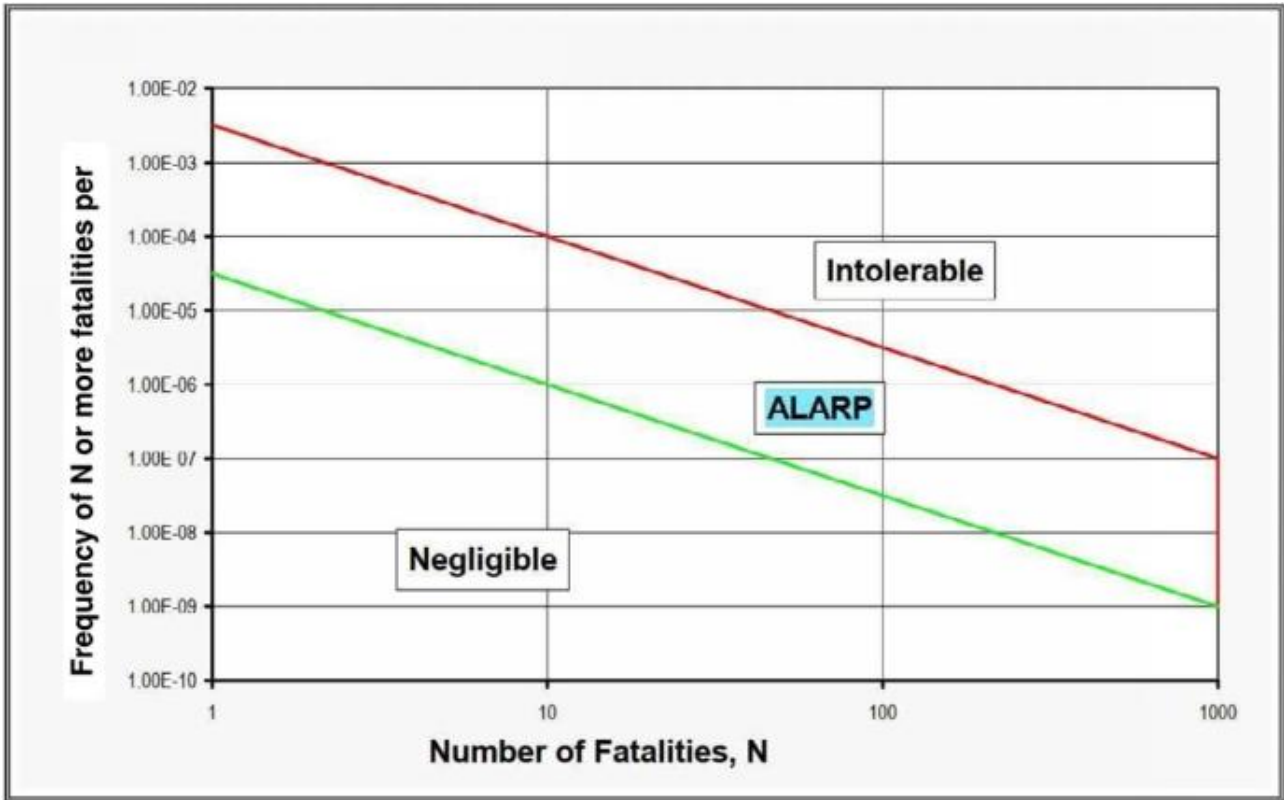


Figure 6-1: Indicative Risk Criteria (via HIPAP 4)

Using this model, the risk matrix above can be adapted using the ALARP model to better explain what controls and mitigations are required for each level of risk.

Table 6-4: Risk Matrix Incorporating ALARP

Likelihood	Severity Of Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	ALARP	ALARP	Intolerable	Intolerable	Intolerable
Likely	ALARP	ALARP	Intolerable	Intolerable	Intolerable
Possible	Negligible	ALARP	ALARP	Intolerable	Intolerable
Unlikely	Negligible	Negligible	ALARP	ALARP	Intolerable
Rare	Negligible	Negligible	ALARP	ALARP	Intolerable

6.2 Hazards Identification

Using the dangerous goods/materials identified in the PRS (Section5), hazards that may result in a risk to people, property and the environment can be produced. To facilitate this an event tree assessment methodology was adopted to determine the relevant initiating scenarios and events that should be analysed through the consequence and risk assessment. The relevant scenarios are shown in below in Table 6-5.

Table 6-5: Hazards Identification

Hazard	Initiating Events/Scenarios
Li-ion battery fire within data halls due to thermal runaway	<ul style="list-style-type: none"> • Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway • Overheating due to HVAC malfunction which leads to batteries going into thermal runaway • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat)
Li-ion battery fire within battery rooms due to thermal runaway	<ul style="list-style-type: none"> • Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway • Overheating due to HVAC malfunction which leads to batteries going into thermal runaway • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat)
Li-ion battery fire within battery storage rooms due to thermal runaway	<ul style="list-style-type: none"> • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat)
Fire occurs in diesel bulk storage area	<ul style="list-style-type: none"> • Loss of containment through: <ul style="list-style-type: none"> ○ Corrosion of tank or pipe work ○ Vandalism ○ Leaking connection ○ Mechanical impact • Ignition sources: <ul style="list-style-type: none"> ○ External electric equipment ○ Nearby hot works ○ Static discharge ○ Static discharge following high-speed loading ○ Bushfire impact (Radiant Heat)
Fire within generator rooms impacting day tanks	<ul style="list-style-type: none"> • Leaking of generator day tanks or associated piping resulting in accumulation of diesel or flammable vapour (diesel + air). • Fuel: <ul style="list-style-type: none"> ○ Formation of flammable/explosive vapour, noting diesel high flash point. ○ Oils or other lubricants present for the diesel engine for the genset • Ignition sources: <ul style="list-style-type: none"> ○ Internal electric equipment or cabling associated with the generator ○ Bushfire impact (Radiant Heat) • Nearby hot works
Fire within the transformer	<ul style="list-style-type: none"> • Fault <ul style="list-style-type: none"> ○ Low oil levels ○ Blocked/faulty pressure relief valve ○ Mechanical damage ○ Internal overvoltage/over current ○ Core insulation degradation

Hazard	Initiating Events/Scenarios
	<ul style="list-style-type: none"> ○ Natural disaster, i.e lighting strike ● Ignition <ul style="list-style-type: none"> ○ Arcing caused by low oil levels ○ External fire
Toxic gas emission from li-ion batteries within data halls	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. ● Flammable off gases ignited by sparking resulting in flaming combustion ● Fire starting elsewhere in the room involving the batteries.
Toxic gas emission from Li-ion batteries within battery rooms	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. ● Fire starting elsewhere in the room involving the batteries.
Toxic gas emission from Li-ion batteries within battery storage rooms	<ul style="list-style-type: none"> ● Defective battery fails and causes thermal runaway. ● Mechanical impact or damage inducing thermal runaway ● Fire starting elsewhere in the room involving the batteries.
Explosion due to li-ion batteries within battery room	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc.
Explosion due to li-ion batteries within data halls	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. causing rapid expansion.
Explosion due to li-ion batteries within battery storage room	<ul style="list-style-type: none"> ● Defective battery fails and causes thermal runaway. ● Mechanical impact or damage inducing thermal runaway
Environmental discharge of contaminated water after fire in battery room	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. ● Fire starting elsewhere in the room involving the batteries. ● Sprinkler discharge and/or FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries.
Environmental discharge of contaminated water after fire in data hall	<ul style="list-style-type: none"> ● Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. ● Fire starting elsewhere in the room involving the batteries. ● Sprinkler discharge and/or FRNSW intervention using hydrants to required to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries.
Environmental discharge of contaminated water after fire in battery storage room	<ul style="list-style-type: none"> ● Fire starting elsewhere in the room involving the batteries. ● Sprinkler discharge and/or FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries.
Environmental discharge of contaminated water after fire in bulk diesel storage	<ul style="list-style-type: none"> ● Loss of containment through: <ul style="list-style-type: none"> ○ Corrosion of tank or pipe work ○ Vandalism ○ Leaking connection ○ Mechanical impact ● Ignition sources: <ul style="list-style-type: none"> ○ External electric equipment ○ Nearby hot works ○ Static discharge ○ Static discharge following high-speed loading ○ Bushfire impact (Radiant Heat)

Hazard	Initiating Events/Scenarios
	<ul style="list-style-type: none"> • FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries.
Spread of contaminated water after fire in generator gantries	<ul style="list-style-type: none"> • Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread.
Fuel leak in diesel piping	<ul style="list-style-type: none"> • Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread.
Fuel leak during fuel tanker operations	<ul style="list-style-type: none"> • Malfunction of fittings on truck causes external fuel leak. • Internal leak during the pumping. • Fill point damaged via impact by car or equipment.
Oil leak in transformer	Loss of containment due to: <ul style="list-style-type: none"> • Malfunction of transformer casing • Corrosion of casing • Vandalism

6.3 Preliminary Risk Assessment

Table 6-6 Preliminary Risk Assessment

Hazard	Initiating Events/Scenarios	Potential Consequences	Risks Before Controls (Likelihood/ Consequence)
Li-ion battery fire within data halls due to thermal runaway	<ul style="list-style-type: none"> • Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway • Overheating due to HVAC malfunction which leads to batteries going into thermal runaway • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat) 	<ul style="list-style-type: none"> • The resultant thermal runaway results in a fire, which may spread: <ul style="list-style-type: none"> ○ Between adjacent battery modules ○ Between adjacent racks ○ Between data halls • Throughout the building • Personal injury to occupants, first responders or attending brigade • Impact to business operations 	Possible and Catastrophic Intolerable
Li-ion battery fire within battery rooms due to thermal runaway	<ul style="list-style-type: none"> • Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway • Overheating due to HVAC malfunction which leads to batteries going into thermal runaway • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat) 	<ul style="list-style-type: none"> • The resultant thermal runaway results in a fire, which may spread: <ul style="list-style-type: none"> ○ Between adjacent battery modules ○ Between adjacent racks ○ Between battery rooms or adjacent rooms ○ Throughout the building • Personal injury to occupants, fire responders or attending brigade • Impact to business operations 	Possible and Catastrophic Intolerable
Li-ion battery fire within battery storage rooms due to thermal runaway	<ul style="list-style-type: none"> • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Bushfire impact (Radiant Heat) 	<ul style="list-style-type: none"> • The resultant thermal runaway results in a fire, which may spread: <ul style="list-style-type: none"> ○ Between adjacent battery modules ○ To adjacent rooms ○ Throughout the building • Personal injury to occupants, fire responders or attending brigade • Impact to business operations 	Possible and Catastrophic Intolerable

<p>Fire occurs in bulk storage area</p>	<ul style="list-style-type: none"> • Loss of containment through: <ul style="list-style-type: none"> ○ Corrosion of tank or pipe work ○ Vandalism ○ Leaking connection ○ Mechanical impact • Ignition sources: <ul style="list-style-type: none"> ○ External electric equipment ○ Nearby hot works ○ Static discharge ○ Static discharge following high-speed loading ○ Bushfire impact (Radiant Heat) 	<ul style="list-style-type: none"> • Fire spread to adjacent tanks or infrastructure • Explosion impacting adjacent tanks or infrastructure • Loss of fuel supply to the generator string fed by the subject tank • Personal injury to occupants, fire responders or attending brigade 	<p>Possible and Catastrophic Intolerable</p>
<p>Fire within generator rooms impacting day tanks</p>	<ul style="list-style-type: none"> • Leaking of generator day tanks or associated piping resulting in accumulation of diesel or flammable vapour (diesel + air). • Fuel: <ul style="list-style-type: none"> ○ Formation of flammable/explosive vapour, noting diesel high flash point. ○ Oils or other lubricants present for the diesel engine for the genset • Ignition sources: <ul style="list-style-type: none"> ○ Internal electric equipment or cabling associated with the generator ○ Nearby hot works ○ Bushfire impact (Radiant Heat) 	<ul style="list-style-type: none"> • Fire spreads from: <ul style="list-style-type: none"> ○ Generator to day tank ○ Throughout generator gantry ○ Through ventilation to generator gantries above and below. ○ Throughout building • Smoke spread through external ventilation through to environment causing impact 	<p>Possible and Catastrophic Intolerable</p>
<p>Fire within the transformer</p>	<ul style="list-style-type: none"> • Fault <ul style="list-style-type: none"> ○ Low oil levels ○ Blocked/faulty pressure relief valve ○ Mechanical damage ○ Internal overvoltage/over current ○ Core insulation degradation ○ Natural disaster, i.e lighting strike • Ignition <ul style="list-style-type: none"> ○ Arcing caused by low oil levels ○ External fire 	<ul style="list-style-type: none"> • Fire spread to adjacent transformer or infrastructure • Possible escalation to involve nearby combustible material • Impact to adjacent transformers and hence power continuity to the site • Personal injury to occupants, fire responders or attending brigade 	<p>Possible and Catastrophic Intolerable</p>

<p>Toxic gas emission from li-ion batteries within data halls</p>	<ul style="list-style-type: none"> • Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. • Flammable off gases ignited by sparking resulting in flaming combustion • Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> • Toxic gas emission may impact occupants, fire responders or land/residents surrounding the site. 	<p>Possible and Catastrophic Intolerable</p>
<p>Toxic gas emission from Li-ion batteries within battery rooms</p>	<ul style="list-style-type: none"> • Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. • Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> • Toxic gas emission may impact occupants, fire responders or land/residents surrounding the site. 	<p>Possible and Catastrophic Intolerable</p>
<p>Toxic gas emission from Li-ion batteries within battery storage rooms</p>	<ul style="list-style-type: none"> • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway • Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> • Toxic gas emission may impact occupants, fire responders or land/residents surrounding the site. 	<p>Possible and Catastrophic Intolerable</p>
<p>Explosion due to li-ion batteries within battery room</p>	<p>Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc.</p>	<ul style="list-style-type: none"> • Impact to adjacent infrastructure • Personal injury to occupants, fire responders or attending brigade • Impact to business operations or loss of customer data 	<p>Possible and Catastrophic Intolerable</p>
<p>Explosion due to li-ion batteries within data halls</p>	<p>Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. causing rapid expansion.</p>	<ul style="list-style-type: none"> • Impact to adjacent infrastructure • Personal injury to occupants, fire responders or attending brigade • Impact to business operations or loss of customer data 	<p>Possible and Catastrophic Intolerable</p>
<p>Explosion due to li-ion batteries within battery storage rooms</p>	<ul style="list-style-type: none"> • Defective battery fails and causes thermal runaway. • Mechanical impact or damage inducing thermal runaway 	<ul style="list-style-type: none"> • Impact to adjacent infrastructure • Personal injury to occupants, fire responders or attending brigade • Impact to business operations or loss of customer data 	<p>Possible and Catastrophic Intolerable</p>

<p>Environmental discharge of contaminated water after fire in battery room</p>	<ul style="list-style-type: none"> • Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. • Fire starting elsewhere in the room involving the batteries. • Sprinkler discharge and/or FRNSW intervention using hydrants to required to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<p>Environmental impact from contaminated fire water runoff.</p>	<p>Possible and Major Intolerable</p>
<p>Environmental discharge of contaminated water after fire in data hall</p>	<ul style="list-style-type: none"> • Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. • Fire starting elsewhere in the room involving the batteries. • Sprinkler discharge and/or FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<p>Environmental impact from contaminated fire water runoff.</p>	<p>Possible and Major Intolerable</p>
<p>Environmental discharge of contaminated water after fire in diesel storage</p>	<ul style="list-style-type: none"> • Loss of containment through: <ul style="list-style-type: none"> ○ Corrosion of tank or pipe work ○ Vandalism ○ Leaking connection ○ Mechanical impact • Ignition sources: <ul style="list-style-type: none"> ○ External electric equipment ○ Nearby hot works ○ Static discharge ○ Static discharge following high-speed loading <p>Sprinkler discharge and/or FRNSW intervention using hydrants to control or extinguish fire. FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries.</p>	<p>Environmental impact from contaminated fire water runoff.</p>	<p>Possible and Major Intolerable</p>

<p>Environmental discharge of contaminated water after fire in battery storage room</p>	<ul style="list-style-type: none"> Defective battery fails and causes thermal runaway. Mechanical impact or damage inducing thermal runaway Fire starting elsewhere in the room involving the batteries. Sprinkler discharge and/or FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<p>Environmental impact from contaminated fire water runoff.</p>	<p>Possible and Major Intolerable</p>
<p>Spread of contaminated water after fire in generator gantries</p>	<p>Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread.</p>	<p>Environmental impact from contaminated fire water runoff.</p>	<p>Possible and Major Intolerable</p>
<p>Fuel leak in diesel piping</p>	<p>Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread.</p>	<ul style="list-style-type: none"> Diesel run off into surrounding area Environmental impact from diesel run off. 	<p>Possible and Major Intolerable</p>
<p>Fuel leak during fuel tanker operations</p>	<ul style="list-style-type: none"> Malfunction of fittings on truck causes external fuel leak. Internal leak during the pumping. Fill point damaged via impact by car or equipment. 	<ul style="list-style-type: none"> Diesel run off into surrounding area Environmental impact from diesel run off. 	<p>Likely and Major Intolerable</p>

6.4 Recommended Controls

To mitigate the risks shown above in Table 6-6, both prevention and mitigation control measures are proposed to be implemented both localised to the hazard and throughout the broader site.

6.4.1 Diesel Storage

To mitigate the risk associated with the storage of diesel on the site the following mitigating controls determined from AS1940:2017 and other applicable standards shall be incorporated for the following locations of diesel storage. Note, prescriptive compliance with the relevant aspects of AS1940:2017 is required.

Table 6-7: Bulk Storage Tank Controls

Item	Design
<i>Tanks</i>	All tanks regardless of location shall comply with the relevant requirements of AS1940:2017 as well as the relevant standard for specific tank location. If bulk tanks are located outdoor above ground, it is required to be double skinned tanks, the primary (inner) tank shall be constructed to AS 1692 or equivalent Standard, the secondary containment shall be adequately designed and constructed, to contain the entire contents of the primary tank. If bulk tanks are buried, it is required to be double skin tanks buried in sand or a single skin tank installed in a chamber complying with Clause 5.13.
<i>Bunds and Compounds</i>	If bulk tanks are located above ground they are proposed to be double skinned tanks complying with Clause 5.9 of AS 1940:2017, therefore no bunds and compounds required.
<i>Fire Hydrants</i>	AS2419.1:2021 system with capacity for up to 3 hydrants (30 L/s) operating.
<i>Portable Fire Extinguishers</i>	At any location where a tank vehicle will refill, tanks shall be provided with at least two powder-type fire extinguishers.
<i>Fuel tanker fill points</i>	Fill tanker fuel points shall comply with AS1940:2017 Clause 5.3.1 SDS held by driver and site personnel The tank fill point shall, where practicable, be in a readily accessible location (outside), on areas that are impervious to diesel (i.e. fill point located on hardstand area), and protected from impact damage by bollards, armco barriers, etc. The proposed tank position is compliant with this requirement. The fill, dip and vapour recovery point for each tank shall be marked to identify it. Each fill point shall be provided with spill containment having a minimum capacity of 15 L per fill point. Such a device shall be fitted to a tank in order to catch and contain any minor spill during product delivery to the tank.
Management Procedures	
<i>Inspection and Maintenance</i>	Tanks shall be regularly inspected and maintained in accordance with manufacturer’s instructions. In addition, underground tanks shall also be maintained in accordance with the requirement of AS 4897:2008.
<i>Emergency Management plan</i>	An Emergency Management Plan in accordance with AS3745:2010 shall be developed and implemented by the site.

Table 6-8: Day Tanks / Generator Enclosure Controls

Item	Design
<i>Generator Gantry rooms</i>	Gantry gantries are 240/240/240 separated from the main portion of the building with a 4-hour fire wall.
<i>Tanks</i>	Day tanks shall be single skinned tanks complying with AS1692:2006.

Item	Design
<i>Bundling</i>	Generator enclosures shall be internally banded with sufficient capacity to contain 110% of the day tank volume (i.e. 1,100 L)
<i>Fire Detection</i>	Generators - Flame detection and 90deg type E heat probes, plus a manual call point located within the enclosure.
<i>Fire Extinguishment/Suppression</i>	Generator Gantry to be protected by a wet-pipe automatic sprinkler system as per OH3 requirements of AS 2118.1:2017 and Generator enclosures shall be protected either with water mist or with sprinklers.
<i>Generators</i>	The gensets shall be designed to AS3010:2017, which includes safety protections to minimise the potential for failure of the generators and subsequent fires. Such safety protections include: Automatic cut off of fuel flow (trigger by fusible link) Temperature monitoring
<i>Piping layout</i>	All piping used to fill day tanks from bulk storage shall drain back into bulk storage while not in use.
Management Procedures	
<i>Inspection and Maintenance</i>	Generators and day tanks shall be regularly inspected and maintained in accordance with manufacture instructions.
<i>Restriction on Storage and Operation of Mobile Plant</i>	No combustible materials are permitted to be located in close proximity to the generator enclosures.

6.4.2 Lithium-Ion Batteries

To mitigate the risk associated with the storage of Lithium-Ion Batteries on the site the following mitigating controls shall be incorporated:

Table 6-9: Lithium Batteries controls

ITEM	MEASURE/INPUT
Batteries	
<i>Storage</i>	Within the battery storage rooms only new, spare, or spent batteries (i.e. not in use) are permitted to be stored. Storage of any other materials is not permitted.
<i>Battery Compliance</i>	<ul style="list-style-type: none"> • The battery system when finalised is required to comply with IEC 62619:2022 [8]. • Lithium-ion batteries stored within the facility must be UL9540A tested, with results showing no module-to-module fire propagation, no external flaming nor flying debris and no re-ignitions. The batteries utilised shall be in the following maximum capacities and configurations: <ul style="list-style-type: none"> ○ Battery Rooms – No more than 100kWh per rack. ○ Data halls – No more than 20kWh per rack, no more than 2 shelves per rack.
<i>Battery Management System (BMS)</i>	Battery Management System (BMS) shall be provided to monitor and protect the Lithium-ion batteries, providing automatic shutdown on fault/over temperature to prevent thermal runaway. System shall also alert the building management team.
<i>In-rack battery configuration</i>	<p>Where Li-ion battery back-up units (BBU) are installed in a server rack as a distributed power system (i.e in-rack batteries) the following recommendations from FM Global data sheet 5-32 [2] are to be implemented:</p> <ul style="list-style-type: none"> • Maximum power capacity of 20 kWh per server rack as a distributed power configuration. • No more than two shelves containing BBU modules located together in the same area of the rack. • Aisle spacing between server rows is a minimum of 4 ft (1.2 m). • Provide vertical barriers in all server rack rows where Li-ion distributed power systems are used or expected to be used, irrespective of the power capacity. Provide vertical barriers as follow (See Figure 6-2): <ul style="list-style-type: none"> ○ Spaced every third rack along the entire length of server rows, ○ Use a minimum 20-gauge (0.9 mm) solid steel sheet metal for the vertical barriers on the side of every 3rd rack to limit the fire spread. ○ Completely cover the side of the server rack and fit the rack profile. ○ Installed in a way that will not reduce the effectiveness of the hot/cold aisle arrangement (kept to the side profile of the server racks). ○ Note, the omission of the vertical barriers may be considered based on the final chemistry type, testing and further analysis.
<i>Fire Separation requirements</i>	<p>Fire separation requirements shall be as follows:</p> <ul style="list-style-type: none"> • Battery Rooms – Minimum 2-hour fire compartments which aligns with NCC requirements. Noting the FRNSW unpublished position on battery rooms are that they are constructed to 4 hours, as such this is currently proposed to be implemented in the current design. • Data halls – Minimum 2-hour fire separation of the floor from the wider floor plate. <p>Note, horizontal separating elements and structure shall be 4 hours to comply with the prescriptive requirements of NCC Spec 5 for a Class 7b.</p>
<i>Ventilation</i>	<p>An automatic mechanical ventilation system shall be provided to the data hall enclosures and battery rooms containing li-ion batteries for ventilation of smoke and noxious gases. The system capacity and design shall be determined as part of the detailed design development based on the specific make/model of battery to be utilised, but at this point is proposed to be as follows:</p> <ul style="list-style-type: none"> • Battery rooms ventilation in accordance with FM Global data sheet 5-33 [3]:

ITEM	MEASURE/INPUT
	<ul style="list-style-type: none"> ○ Under normal operation battery room will ventilate based on Australian Standard battery room ventilation requirements. ○ In the event of a fire or activation of the of gas-detection system within the battery room, ventilation system will increase to accommodate peak ventilation volume based on venting data from likely battery vendors and to align with the FM5-33 standard of 0.75 m³/min/m² (typically 750 l/s to 100 l/s depending on the room size) to ensure LEL for relevant off gases are not exceeded. ● Data hall ventilation: <ul style="list-style-type: none"> ○ Noting that FM Global data sheet 5-32 [2] does not require mechanical ventilation to data halls where in-rack batteries are provide. Regardless, dedicated automatic ventilation is proposed to be provided to the data halls to assist with fire brigade intervention. Exact rates and function to be determined during design development, but broadly the minimum requirements shall be as follows: <ul style="list-style-type: none"> ○ The system is to activate upon activation of the sprinkler system in the respective area or the manual controls, as required by FM5-32. ○ System capacity must be capable of exhausting at a rate of at least 1 enclosure air change per hour. ○ All fans, motors and cabling must comply with AS1668.1 for a smoke exhaust system ○ AUTO/ON/OFF switches must be located at the FFCP. ○ The system shall be considered an essential fire safety service <p>Note, the requirements and performance of the ventilation system has been driven out of discussions to date with the fire brigade and shall be subject to site specific discussions with the brigade for this project.</p>
<i>New Battery Storage Rooms</i>	<ul style="list-style-type: none"> ● No ignition sources or other storage shall be permitted within the new battery storage rooms. ● Transportation and storage of any new lithium batteries shall be in accordance with the Australian Class 9 restrictions for hazardous materials/dangerous goods. ● Stored battery shall have a State of Charge (SOC) not exceeding 30% ● The maximum storage capacities for each room shall be presented in the room via permanent signage in capital lettering, with minimum text height of 20 mm, on a colour contrasting background.
<i>Spent Battery Storage Rooms</i>	<ul style="list-style-type: none"> ● Dedicated cabinets shall be provided for Dropped/Damaged/Ruptured (DDR) Batteries that have been checked for temperature increase prior to disposal. Spent batteries shall be moved offsite as soon as possible for proper disposal such that the storage capacity of the room is not met.
<i>Off gas detection</i>	<ul style="list-style-type: none"> ● Battery rooms - To enable early detection and recognition of the thermal runaway process, off-gas detection sensors (e.g., Li-ion Tamer[®] by Xtralis or other suitable system) shall be provided to serve each dedicated battery room containing lithium-ion batteries. Li-ion Tamer[®] sensors are designed to be sensitive to gaseous compounds released by lithium-ion batteries during the initial cell venting stage of battery abuse and failure. It is understood to be the intent for the battery management system to interlock with Li-ion Tamer[®] system to control the battery system on off-gas detection. The Li-ion Tamer[®] will output a signal to the battery management system once battery failure is detected which will then trip off the battery units in the corresponding sector. ● Data Halls – It is not current proposed to provide off-gas detection within the data halls due to the reduced battery density within the halls.
<i>Detection</i>	<ul style="list-style-type: none"> ● Dedicated smoke detection in the form of MASD shall be provided both within the data halls and within the battery rooms.

ITEM	MEASURE/INPUT
<i>Fire Hydrants</i>	<ul style="list-style-type: none"> AS2419.1:2021 system with capacity for up to 3 hydrants (30 L/s) operating.
<i>Sprinkler Performance</i>	<ul style="list-style-type: none"> An appropriate fire suppression system will be required to control the development of a fire involving lithium-ion batteries. The pre-action sprinkler system design shall be in accordance with AS2118.1 with the following increased performance: Battery rooms (including new/spent batteries) - 12.2mm/min over the room area and 90 min duration in accordance with FM global data sheet 5-33 [3] (Chemistries other than LFP may impact the required duration). Data halls – 8mm/min over 330 m² and 60 min duration in accordance with FM global data sheet 5-32 [2]. (Chemistries other than LFP may impact required duration).
<i>Contaminated water retention</i>	<ul style="list-style-type: none"> The water run-off from sprinkler activation and brigade hydrant operation shall be considered for containment within the facility due to potential contaminants. Water runoff from the data halls or the dedicated battery rooms where batteries are provided. The current design proposes three dedicated containment tanks totalling 620,000 L. Appropriate drainage shall be provided to other areas to facilitate this. The tank capacity has been determined based the proposed data hall sprinkler design (FM5-32) for the full sprinkler design density and area (i.e 8mm/min x 320 m²) of operation for 60 minutes, plus 3 hydrants (10L/s each) for a 4-hour duration as per the proposed design. Access shall be provided to the tank, with a plan provided at the main FDCIE to alert attending emergency service personnel of its presence should they elect to test the runoff water for contaminants. Access shall be provided to the tank, with a plan provided at the main FDCIE to alert attending emergency service personnel of its presence should they elect to test the runoff water for contaminants. Note, that removal and treatment of any contaminated water is outside of brigade’s remit.
Management Procedures	
<i>Inspection and Maintenance</i>	All Essential Fire Safety Measures shall be maintained in accordance with the requirements of AS1851:2012.
<i>Management In Use Plan</i>	<p>A Management In Use Plan (MIUP) is also to be prepared to maintain the effective operation of the site throughout the life of the development, this shall at a minimum include the following:</p> <ul style="list-style-type: none"> As per FM global data sheet 5-32 [2] Clause 2.3.4.3 – Combustibles shall not be stored in electrical or mechanical equipment rooms.
<i>Post fire protocols</i>	<p>Post battery fire event protocols shall be included within the Emergency Response Plan for the site and shall include protocols for reignition risks, including at a minimum:</p> <ul style="list-style-type: none"> Moving fire affected batteries to external areas post fire event. Firewatch for 48 hours.

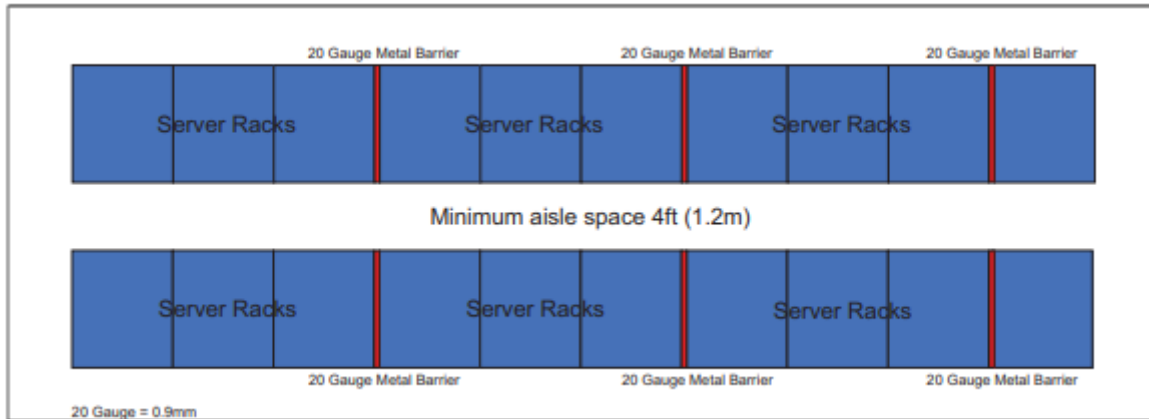


Figure 6-2: Example of vertical barriers recommended in FM global data sheet 5-32

6.4.3 Transformer Oil (HVSS)

To mitigate the risk associated with the storage of transformer oil on the site the following mitigating controls shall be incorporated for the high voltage transformers in the substation:

Table 6-10: HVSS Oil Controls

ITEM	DESIGN
<i>High Voltage Substation</i>	<ul style="list-style-type: none"> • The high voltage substation incorporates 4 x 175MVA transformers, compliant with the requirement of AS3000:2018 and AS2067:2008. • Oil type – Mineral oil (Flash point approximately 140°C) or better (high flash point) • Bund shall be provided to each transformer with capacity of 110% for the total volume of oil within the subject transformer, additionally: <ul style="list-style-type: none"> ○ Bunds shall be fitted with oil separators ○ Separation distance to adjacent infrastructure in accordance with Code requirements • Separation from any other infrastructure on site in adherence to AS2067 • Blast Walls - Blast walls achieving minimum 120/120/120 FRL shall be provided between transformers in accordance with the requirements in AS2067-2008. • Hydrants providing coverage to the substation shall be demonstrated to be afforded sufficient separation distance from the transformers, such that safe fire fighter access in the event of credible fire scenario is provided.

6.4.4 Sitewide Measures

In addition to the specific measures detailed above, as required by the NCC the building shall also contain the following DtS measures:

- Type A Construction
- Automatic fire detection and alarm systems
- Automatic fire suppression systems
- Emergency lifts
- Emergency lighting and exit signage
- Emergency warning and intercommunication systems
- Fire hydrant system
- Fire control centre
- Fire hose reels (ground floor loading dock area only)
- Portable fire extinguishers
- Stair pressurisation system to fire isolated exits

Above the prescriptive NCC requirements for the site the following measures are also proposed to be implemented:

- Vehicular perimeter access around each building in accordance with NCC C3D5 (2), despite the building not being considered a Large Isolated Building. Note, that certain portions of both buildings exceed the 18m maximum requirement from the buildings.

Bushfire protection recommendations as per the BlackAsh Bushfire Hazard Report dated 11th February 2026 shall be followed as applicable throughout the site. Whilst the efficacy of these measures is outside the scope of this risk assessment, as per the conclusions of bushfire report the bushfire risk is considered to be appropriately controlled and as such shall not be considered as initiating events in the below revised Risk Assessment.

6.5 Revised Risk Assessment

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
Li-ion battery fire within data halls due to thermal runaway	<ul style="list-style-type: none"> Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway Overheating due to HVAC malfunction which leads to batteries going into thermal runaway Defective battery fails and causes thermal runaway. Mechanical impact or damage inducing thermal runaway 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. Nor are the LEL limits be exceeded. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation Battery systems modular and compartmentalised to minimise spread within the rack Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Access controls for HV areas (arc flash risk). Maintenance program and testing/inspection procedures. No motorised plant in the data hall once its occupied (i.e forklifts/scissor lifts/etc) 	<ul style="list-style-type: none"> Battery rooms separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 Sprinkler system provided commensurate to the hazard Hydrants Multi-aspirated smoke detection (MASD) Dedicated mechanical ventilation system on essential services provided 	Unlikely and Moderate ALARP
Li-ion battery fire within in battery rooms due to thermal runaway	<ul style="list-style-type: none"> Over charging of the batteries through a charger malfunction causes battery to go into thermal runaway Overheating due to HVAC malfunction which leads to batteries going into thermal runaway Defective battery fails and causes thermal runaway. 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. Nor did LEL limits are the exceeded. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation 	<ul style="list-style-type: none"> Data halls separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 	Unlikely and Moderate ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
	<ul style="list-style-type: none"> Mechanical impact or damage inducing thermal runaway 	<ul style="list-style-type: none"> Battery systems modular and compartmentalised to minimise spread within the rack Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Off gas detection provided to the rooms Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Access controls for HV areas (arc flash risk). Maintenance program and testing/inspection procedures No motorised plant in the room once its occupied (i.e forklifts/scissor lifts/etc) 	<ul style="list-style-type: none"> Sprinkler system provided commensurate to the hazard Hydrants Multi-aspirated smoke detection (MASD) 	
Li-ion battery fire within battery storage rooms due to thermal runaway	<ul style="list-style-type: none"> Defective battery fails and causes thermal runaway. Mechanical impact or damage inducing thermal runaway 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. Nor did LEL limits be exceeded. Cell overpressure detection and protection. No motorised plant in the room once its occupied (i.e forklifts/scissor lifts/etc) Smoke detection provided to the rooms 24/7 FM team. New Battery modules to be stored in original packaging and not at a SOC >30% and are not connected to any power systems. Sprinkler system provided commensurate to the hazard 	<ul style="list-style-type: none"> Rooms separated from adjacent infrastructure with minimum 120/120/120 construction and from rooms above and below by 240/240/240 construction. Strobe light and signage at entrances to the room, triggered by off gas detection to alert FM staff or FRNSW. HVAC ductwork for amenity ventilation 	Unlikely and Moderate ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
			goes directly to outside, thereby providing a relief path for positive pressure.	
Fire occurs in bulk storage area	<ul style="list-style-type: none"> Loss of containment through: <ul style="list-style-type: none"> Corrosion of tank or pipe work Vandalism Leaking connection Mechanical impact Ignition sources: External electric equipment <ul style="list-style-type: none"> Nearby hot works Static discharge Static discharge following high-speed loading 	<ul style="list-style-type: none"> As diesel is a C1 combustible liquid it has insufficient flammable vapour at ambient temperatures (i.e. its below flash point) Control of combustible adjacent to tanks, reducing the likelihood of an external fire heating the tanks. Tanks comply with AS1692-2006 Tanks comply with AS1940:2017 regarding separation and are freely vented Loading rates (refill rate) to tanks is limited Secure site with 24/7 staffing Routine maintenance and inspection Spillage containment that has a minimum capacity of 15 L within the tank chamber (for pump/tank maintenance) 	<ul style="list-style-type: none"> Hydrants PFEs provided in accordance with BCA and AS1940:2017 	Rare and Moderate ALARP
Fire within generator rooms impacting day tanks	<ul style="list-style-type: none"> Leaking of generator day tanks or associated piping resulting in accumulation of diesel or flammable vapour (diesel + air). Fuel: <ul style="list-style-type: none"> Formation of flammable/explosive vapour, noting diesel high flash point. Oils or other lubricants present for the diesel engine for the genset Ignition sources: <ul style="list-style-type: none"> Internal electric equipment or cabling associated with the generator Nearby hot works 	<ul style="list-style-type: none"> As diesel is a C1 combustible liquid it has insufficient flammable vapour at ambient temperatures (i.e. its below flash point) Generators are compliant to AS3010-2017, reducing likelihood of failure and subsequent fire. Automatic cutoff of fuel flow to day tanks as required by AS1940:2017 Day tanks are small capacity (1000L), thereby limiting the amount of diesel present. Routine maintenance and inspection 	<ul style="list-style-type: none"> Fire detection provided with in the generator enclosures Hydrants PFE Water mist suppression system or sprinklers provided within the generator set Automatic sprinkler systems to the surrounding gantry Automatic flame detection within the generators 	Rare and Moderate ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
Fire within the transformer	<ul style="list-style-type: none"> Fault <ul style="list-style-type: none"> Low oil levels Blocked/faulty pressure relief valve Mechanical damage Ignition <ul style="list-style-type: none"> Arcing caused by low oil levels External fire 	<ul style="list-style-type: none"> Pressure relief device (PRD) on transformer oil reservoir Maintenance of electrical equipment Compliance with AS2067 	<ul style="list-style-type: none"> Transformers are banded with 110% oil capacity containment Bunds are fitted with oil separators Separation distance to adjacent infrastructure in accordance with Code requirements Hydrants Fire/blast separating walls between transformers as per AS2067 	Rare and Moderate ALARP
Toxic gas emission from lithium batteries within data halls	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. Flammable off gases ignited by sparking resulting in flaming combustion Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation Battery systems modular and compartmentalised to minimise spread within the rack Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Access controls for HV areas (arc flash risk). 	<ul style="list-style-type: none"> Data halls separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240. Sprinkler system provided commensurate to the hazard Hydrants Dedicated mechanical ventilation system on essential services provided 	Unlikely and Moderate ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
		<ul style="list-style-type: none"> Maintenance program and testing/inspection procedures 		
Toxic gas emission from Li-ion batteries within battery rooms	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation Battery systems modular and compartmentalised to minimise spread within the rack Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Off gas detection provided to the rooms Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Access controls for HV areas (arc flash risk). Maintenance program and testing/inspection procedures 	<ul style="list-style-type: none"> Battery rooms separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 Sprinkler system provided commensurate to the hazard Hydrants Dedicated mechanical ventilation system on essential services provided 	Unlikely and Moderate ALARP
Toxic gas emission from Li-ion batteries within battery storage rooms	<ul style="list-style-type: none"> Defective battery fails and causes thermal runaway. Mechanical impact or damage inducing thermal runaway Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. No motorised plant in the room once its occupied (i.e forklifts/scissor lifts/etc) Smoke detection provided to the rooms 24/7 FM team. New Battery modules to be stored in original packaging and not at a SOC >30% and are not connected to any power systems. 	<ul style="list-style-type: none"> Rooms separated from adjacent infrastructure with minimum 120/120/120 construction and from rooms above and below by 240/240/240 construction. Strobe light and signage at entrances to 	Unlikely and Moderate ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
			the room, triggered by off gas detection to alert FM staff or FRNSW. <ul style="list-style-type: none"> HVAC ductwork for amenity ventilation goes directly to outside, thereby providing a relief path for positive pressure. 	
Explosion due to li-ion batteries within battery room	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. 	<ul style="list-style-type: none"> HVAC systems with AS compliant ventilation rates as demonstrated to be adequate to the battery type. HVAC system is feed from a N+1 power supply with 48 hour generator backup. Batteries are UL9540A tested and compliant where it was demonstrated that explosion did not occur from the module of origin. Nor were the LEL limits exceeded. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. CO detection provided to rooms Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Maintenance program and testing/inspection procedures 	<ul style="list-style-type: none"> Battery rooms separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 Dedicated mechanical ventilation system on essential services provided 	Rare and Major ALARP
Explosion due to li-ion batteries within data halls	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away due to mechanical, thermal, aging, manufacturing fault etc. causing rapid expansion. 	<ul style="list-style-type: none"> HVAC systems with AS compliant with ventilation rates as demonstrated to be adequate to the battery type. HVAC system is feed from a N+1 power supply with 48 hour generator backup. Batteries are UL9540A tested and compliant where it was demonstrated that explosion did not 	<ul style="list-style-type: none"> Data halls separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and 	Rare and Major ALARP

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
		<p>occur from the module of origin. Nor were the LEL limits exceeded.</p> <ul style="list-style-type: none"> • Overcharging and electrical circuit protection. • AS3000:2018 compliant electrical design and installation • Battery systems modular and compartmentalised to minimise spread within the rack • Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. • Thermal overtemperature detection and prevention. • Cell overpressure detection and protection. • Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. • Access controls for HV areas (arc flash risk). • Maintenance program and testing/inspection procedures 	<p>between levels with 240/240/240</p> <ul style="list-style-type: none"> • Dedicated mechanical ventilation system on essential services provided 	

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
Explosion due to li-ion batteries within battery storage rooms	<ul style="list-style-type: none"> Defective battery fails and causes thermal runaway. Mechanical impact or damage inducing thermal runaway 	<ul style="list-style-type: none"> Batteries are UL9540A tested and compliant where it was demonstrated that fire spread did not occur from the module of origin. No motorised plant in the room once its occupied (i.e forklifts/scissor lifts/etc) Smoke detection provided to the rooms 24/7 FM team. New Battery modules to be stored in original packaging and not at a SOC >30% and are not connected to any power systems. 	<ul style="list-style-type: none"> Rooms separated from adjacent infrastructure with minimum 120/120/120 construction and from rooms above and below by 240/240/240 construction. Strobe light and signage at entrances to the room, triggered by off gas detection to alert FM staff or FRNSW. HVAC ductwork for amenity ventilation goes directly to outside, thereby providing a relief path for positive pressure. 	Unlikely and Moderate ALARP
Environmental discharge of contaminated water after fire in battery room	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> Batteries are UL9540A tested where it was demonstrated that fire spread did not occur from the module of origin. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation 	<ul style="list-style-type: none"> Battery rooms separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 	Unlikely and Insignificant Negligible

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
	<ul style="list-style-type: none"> Sprinkler discharge and/or FRNSW intervention using hydrants to required to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<ul style="list-style-type: none"> Battery systems modular and compartmentalised to minimise spread within the rack Adequate spacing of battery modules. Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Battery module location sufficient distance from other infrastructure, reducing likelihood of external fire impacting battery rooms. Infrastructure for batteries located to be directly accessible to emergency responders. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Remote monitoring (BMS) and 24/7 security team including response procedure for BMS battery fault. Off-gas detection provided. Access controls for HV areas (arc flash risk). Maintenance program and testing/inspection procedures Sprinkler system provided commensurate to the hazard such the likelihood of the requirement for brigade intervention and the application of hydrant water is reduced. 	<ul style="list-style-type: none"> Hydrant Drainage is provided to the rooms and a dedicated 620kL capture tank is provided. 	
<p>Environmental discharge of contaminated water after fire in data hall</p>	<ul style="list-style-type: none"> Failure of battery protection system resulting in thermal run away and associated fire due to mechanical, thermal, aging, manufacturing fault etc. Fire starting elsewhere in the room involving the batteries. 	<ul style="list-style-type: none"> Batteries are UL9540A tested where it was demonstrated that fire spread did not occur from the module of origin. Overcharging and electrical circuit protection. AS3000:2018 compliant electrical design and installation 	<ul style="list-style-type: none"> Data halls separated from adjacent infrastructure on the floor with minimum 120/120/120 construction and between levels with 240/240/240 	<p>Unlikely and Insignificant Negligible</p>

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
	<ul style="list-style-type: none"> Sprinkler discharge and/or FRNSW intervention using hydrants to required to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<ul style="list-style-type: none"> Battery systems modular and compartmentalised to minimise spread within the rack Adequate spacing of battery modules. Battery Management System provides functional safety of electronic safety-related systems certified to IEC61508. Battery module location sufficient distance from other infrastructure, reducing likelihood of external fire impacting battery rooms. Infrastructure for batteries located to be directly accessible to emergency responders. Thermal overtemperature detection and prevention. Cell overpressure detection and protection. Remote monitoring and 24/7 FM team. Access controls for HV areas (arc flash risk). Maintenance program and testing/inspection procedures Sprinkler system provided commensurate to the hazard such the likelihood of the requirement for brigade intervention and the application of hydrant water is reduced. 	<ul style="list-style-type: none"> Hydrant Drainage is provided to the halls and a dedicated 620kL capture tank is provided. 	
Environmental discharge of contaminated water after fire in diesel storage	<ul style="list-style-type: none"> Loss of containment through: <ul style="list-style-type: none"> Corrosion of tank or pipe work Vandalism Leaking connection Mechanical impact Ignition sources: <ul style="list-style-type: none"> External electric equipment Nearby hot works Static discharge Static discharge following high-speed loading 	<ul style="list-style-type: none"> As diesel is a C1 combustible liquid it has insufficient flammable vapour at ambient temperatures (i.e its below flash point) Control of combustible adjacent to tanks, reducing the likelihood of an external fire heating the tanks. Tanks comply with AS1692-2006 Tanks comply with AS1940:2017 regarding separation and are freely vented Loading rates (refill rate) to tanks is limited Secure site with 24/7 staffing 	<ul style="list-style-type: none"> PFEs provided in accordance with BCA and AS1940:2017 	Unlikely and Minor Negligible

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
	<ul style="list-style-type: none"> FRNSW intervention using hydrants to control or extinguish fire. Water used for this purpose is contaminated by materials within the subject batteries. 	<ul style="list-style-type: none"> Routine maintenance and inspection 		
Spread of contaminated water after fire in generator gantries	<ul style="list-style-type: none"> Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread. 	<ul style="list-style-type: none"> As diesel is a C1 combustible liquid it has insufficient flammable vapour at ambient temperatures (i.e. its below flash point) Generators are compliant to AS3010-2017, reducing likelihood of failure and subsequent fire. Automatic cutoff of fuel flow to day tanks as required by AS1940:2017 Day tanks are small capacity (1000L), thereby limiting the amount of diesel present. Routine maintenance and inspection 	<ul style="list-style-type: none"> Fire detection provided within the generator enclosures PFE Water mist suppression system provided within the generator set (water mist relying on far lower flow rate than sprinklers). 	Unlikely and Minor Negligible
Fuel leak in diesel piping	<ul style="list-style-type: none"> Sprinkler discharge and FRNSW intervention using hydrants to extinguish fire or prevent fire spread. 	<ul style="list-style-type: none"> Routine maintenance Secure site with 24/7 staffing 	<ul style="list-style-type: none"> N/A 	Unlikely and Minor Negligible
Fuel leak during fuel tanker operations	<ul style="list-style-type: none"> Malfunction of fittings on truck causes external fuel leak. Internal leak during the pumping. Fill point damaged via impact by car or equipment. 	<ul style="list-style-type: none"> Overfill protection system Bollards or other protection device to the fill point Routine maintenance Secure site with 24/7 staffing Spillage containment that has a minimum capacity of 15 L within the tank chamber (for pump/tank maintenance) 	<ul style="list-style-type: none"> Bund to bulk fuel tank being the refill point Emergency Response Plan 	Possible and Moderate ALARP
Oil leak in transformer	<p>Loss of containment due to:</p> <ul style="list-style-type: none"> Malfunction of transformer casing Corrosion of casing Vandalism 	<ul style="list-style-type: none"> Maintenance of electrical equipment Compliance with AS2067 	<ul style="list-style-type: none"> Transformers are banded with 110% oil capacity containment <ul style="list-style-type: none"> Bunds are fitted with oil separators Separation distance to 	Unlikely and Insignificant Negligible

Hazard	Initiating Events/Scenarios	Prevention Controls	Mitigating Controls	Residual Risk
			adjacent infrastructure in accordance with Code requirements	

7. Consideration of Relevant Standards and Datasheets Required by the SEARS

Further to the PRS and PHA, as required by the SEARs, the Project shall:

- Demonstration that 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
- Demonstration that 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 – Secondary 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.

It shall be noted that the fire safety considerations and controls raised from these Standards may be in addition to what is prescribed by the NCC. The site Fire Safety Concept Strategy, in addition to the fire services design drawings shall also include all the relevant requirements.

7.1 FM Global property loss prevention data sheets 5-32- Data centres and related facilities

This data sheet provides property loss prevention recommendations for data centres and their critical systems and equipment. It also identifies the hazards associated with these facilities and recommends risk mitigation solutions to prevent property loss. As detailed in Section 6.4, the relevant aspects of this standard have been considered and implemented to address the risk associated with the lithium-ion batteries. Specifically, the configuration of the batteries within the server racks (max capacities, spacing, etc) and the performance of the automatic sprinkler system. Noting that the NCC required performance of elements such as fire separation, exceed that required by this standard. It shall be noted that where batteries are proposed in densities or configurations beyond the scope of this standard (i.e UPS battery rooms), the sprinkler performance is proposed to be align with FM5-33 - *LITHIUM-ION BATTERY ENERGY STORAGE SYSTEMS* in lieu of this standard. FM5-33 having a more onerous sprinkler requirement (increased design density) compared with that required by FM5-32 or by AS2118.1.

7.2 AS/NZS 4681- The storage and handling of class 9 (miscellaneous) dangerous goods and articles

The Project shall consider provisions from this Standard whilst the batteries are not in use and are stored onsite. The design requirements for Li-ion batteries based on AS/NZS 4681:2000 have been summarised in the following table.

Table 7-1: Relevant Li-ion Battery Storage Requirements, in accordance with AS/NZS 4681:2000

Item	Requirement
Separation distance	No specific separation distances apply to stores of Li-ion batteries
Ventilation	Adequate mechanical or natural ventilation shall be provided. As the batteries are sealed, they are unlikely to release any vapours; hence, ventilation in accordance with the BCA is considered sufficient.
Spillage Containment	Where liquids are stored, spillage containment shall be provided. Lithium-ion batteries contain solid anodes and cathodes as well as a liquid electrolyte. The whole unit is sealed to provide containment within the battery. Furthermore, the batteries are individual cells stacked together to form an overall unit resulting in low volumes of electrolyte within a solitary module. Failure of an individual cell within a unit does not result in large volumes of liquid release. Therefore, any spills which occur would be contained within the immediate vicinity of the batteries. Regardless as detailed previously contaminated water storage is proposed to all battery storage areas as part of the overall strategy.
Fire Protection	The standard requires a dry chemical fire extinguisher to be provided for the data halls; however, this type can potentially corrode electrical equipment. It is noted in the

Item	Requirement
	design that an automatic sprinkler system and CO2 extinguishers shall be used as additional fire protection measures for the Li-ion batteries.

7.3 AS IEC 62619 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications

This standard specifies requirements and tests for the safe operation of secondary lithium cells and batteries used in industrial applications. The Project shall consider requirements and tests for the safe operation of the lithium-ion batteries in that the batteries shall be verified as compliant to this Standard, as detailed in Section 6.4.

7.4 AS 1940 - The storage and handling of flammable and combustible liquids

This Standard provides requirements for safe storage and handling of flammable and combustible liquids. The Project shall consider requirements outlined in this standard for the bulk diesel and fuel day storage tanks, with specific controls recommended in Section 6.4. Noting that no departures to this Standard are proposed.

8. Recommendation and Conclusion

A review of the proposed hazardous goods stored within the proposed data centre located at 10 Roberts Rd, Eastern Creek NSW 2766 was conducted against the requirements of Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) and Work Health and Safety Regulation 2025. It was found that both diesel storage and the Lithium-ion Batteries quantities proposed to be stored on the site will exceed the WorkCover NSW (now SafeWork) notification and manifest threshold and the Work Health and Safety Regulations threshold quantities of Part 7.1. Therefore, Regulatory requirements are triggered for:

- WorkCover NSW notification (now Safe Work NSW)
- A dangerous goods manifest
- Safety Data Sheets (SDS)
- Appropriate cleanup equipment be kept onsite
- An Emergency Response Plan (ERP) is to be produced for the site

Additionally, as the proposed diesel fuel and battery storage exceeds the Schedule 1 quantities in PotEOPA, an EPA license will be required for the site.

As per Section 6, a Preliminary Hazard Analysis was then conducted which undertook a qualitative assessment of risks associated with the configuration and operations of the site. The assessment evaluated the risks of the site with potential to impact and risk of human fatalities, property damage and environmental pollution. Hazard treatment measures have been proposed, where required, to produce a 'As Low As Reasonably Practicable' level of risk in accordance with the risk acceptance criteria described in Section 6.1. Proposed prevention and mitigation control measures are identified in Section 6.4 and shall be implemented into the design and construction for the site.

Further to the PRS and PHA, as required by the SEARs, the assessment demonstrated consideration of the following:

- That 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
- That 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 – Secondary 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.

Therefore, it is considered that the proposed development with suitable engineering and design controls in place, would not be considered to be an offensive or hazardous development on site.

Note, it is expected that a Fire Safety Study in accordance with HIPAP No.2 will be required as a condition of the consent for the project and will be undertaken during the project development.

9. Nomenclature

Acronym	Expansion
ABCB	Australian Building Codes Board
AFEG	Australian Fire Engineering Guidelines
AFSS	Annual Fire Safety Statement
ALARP	As low as reasonably possible
ASE	Alarm Signalling Equipment
ASET	Available Safe Egress Time
BMS	Battery Management System
BPAD	Bushfire Planning and Design Accreditation Scheme
CFD	Computational Fluid Dynamics
DtS	Deemed-to-Satisfy
EPA	Environmental Protection Authority
FDS	Fire Dynamics Simulator
FDCIE	Fire Detection Control and Indicating Equipment
FCC	Fire Control Centre
FER	Fire Engineering Report
FIP	Fire Indicator Panel
FM	Factory Mutual
FRL	Fire Resistance Level
FRNSW	Fire Rescue NSW
FSCS	Fire Safety Concept Strategy
FSS	Fire Safety Study
HIPAP-6	Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis’s
HIPAP-4	Hazardous Industry Planning Advisory Paper No 4 -Risk Criteria for Land Use Safety Planning
HVSS	High Voltage Substation
MLRA	Multi-Level Risk Assessment
NCC	National Construction Code
NFPA	National Fire Protection Association
PBDB	Performance Based Design Brief
PotEOPA	Protection of the Environment Operations Act 1997
PRS	Preliminary Risk Screening
PHA	Preliminary Hazard Analysis
RSET	Required Safe Egress Time
RTI	Response Time Index
SEPP	State Environmental Planning Policy


Acronym	Expansion
WHSR	Work Health and Safety Regulation 2025

10. References

1. Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.9, 2024
2. FM Global Property Loss Prevention Data Sheet 5-32, Data Centers and Related Facilities, April 2
3. FM Global Property Loss Prevention Data Sheet 5-33, Lithium-Ion Battery Energy Storage Systems, April 2025
4. FM Global Property Loss Prevention Data Sheet 7-32, Ignitable Liquid Operations, January 2024
5. MIDEL eN 1204 Product brochure, MIDEL & MIVOLT Fluids Ltd. 2025
6. Hazardous Industry Planning Advisory Paper No 4 Risk Criteria for Land Use Safety Planning, dated January 2011, by NSW Department of planning
7. Hazardous Industry Planning Advisory Paper No 6 Hazard Analysis, dated January 2011, by NSW Department of planning
8. IEC 62619:2022 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications. International Electrotechnical Commission, in November 2017
9. NSW Government, ‘Protection of the Environment Operations Act 1997 No 156’, current version for 12 December 2025 to date
10. Safe Work Australia, Guild for Major Hazard Facilities – Safety Assessment, March 2012
11. SafeWork Australia, Manifest requirements for hazardous chemicals, <https://www.safeworkaustralia.gov.au/safety-topic/hazards/chemicals/hazardous-chemical-records-and-signs-workplaces/manifest-requirements-hazardous-chemicals>
12. Work Health and Safety Regulation 2017, under the Work Health and Safety Act 2011, dated 11 August 2017
13. Yao, H.; Lv, K.; Lou, Z.; Xing, M.; Qin, H.; Song, H.; Lv, Z.; Wang, D.; Wang, Z.; Ren, W, ‘Simulation study on oil pressure problems caused by internal faults in oil-immersed transformers’. Process Saf. Environ. Prot. 2023, 175, 190–198.

Appendix A Jemena Gas Network Protection Dial Before You Dig Response

Jemena Gas Network Protection
Jemena Asset Management Pty Ltd ABN 53 086 013 461
for and on behalf of Jemena Gas Networks (NSW) Ltd ABN 87 003 004 322

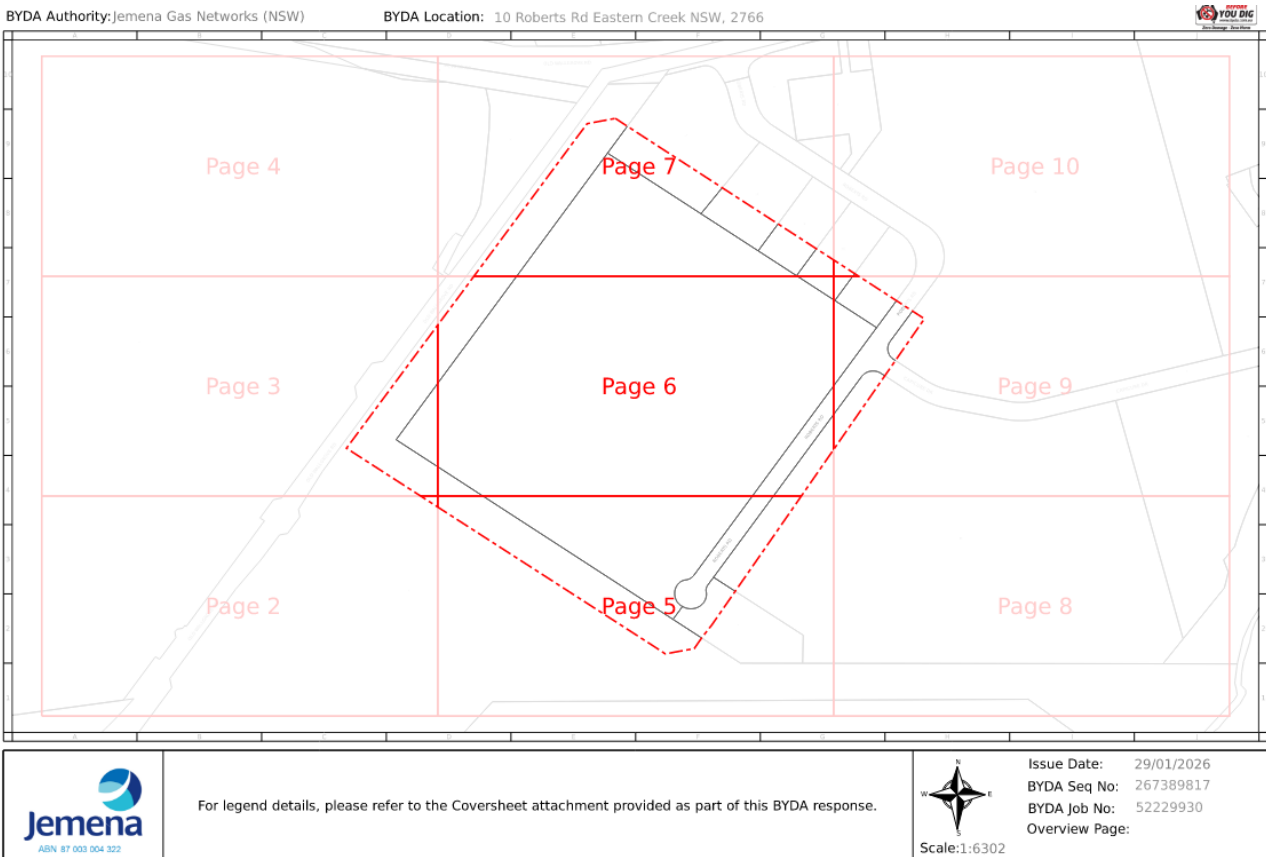


NO ASSETS AFFECTED

This information is only valid for 28 days from the date of issue

Please note that there are **No Gas Mains or Services** in the vicinity of your intended work, as generally illustrated on the attached map. For an explanation of the map, please see the legend attached and read the important information below.

Please note that you have duty of care to ensure that Jemena's assets are not compromised or damaged during any digging, future development or construction work.



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Figure A-1: Dial Before You Dig enquiry results regarding gas infrastructure – 29/01/26

BYDA Authority: Jemena Gas Networks (NSW)

BYDA Location: 10 Roberts Rd Eastern Creek NSW, 2766

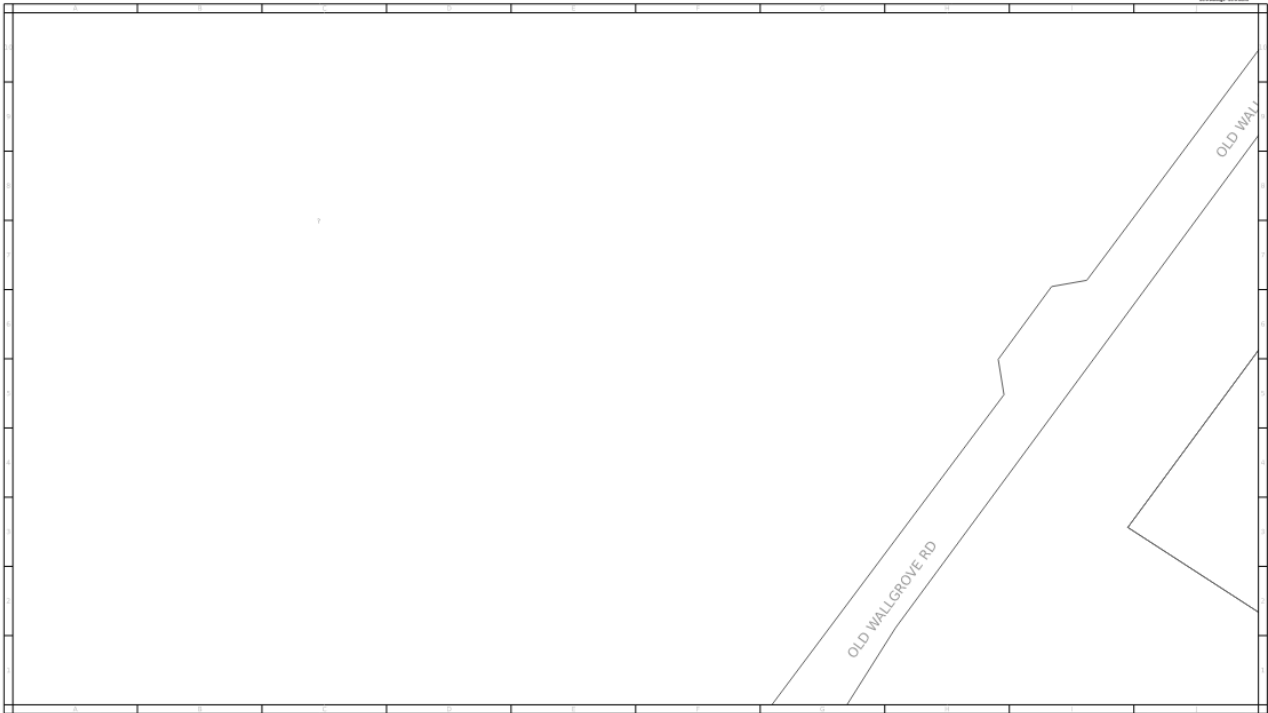


<p>ABN 87 003 004 322</p>	<p>For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.</p>	<p>Scale: 1:2000</p> <p>0m 10m 20m 30m 40m 50m 60m 70m 80m</p>
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Scale: 1:2000

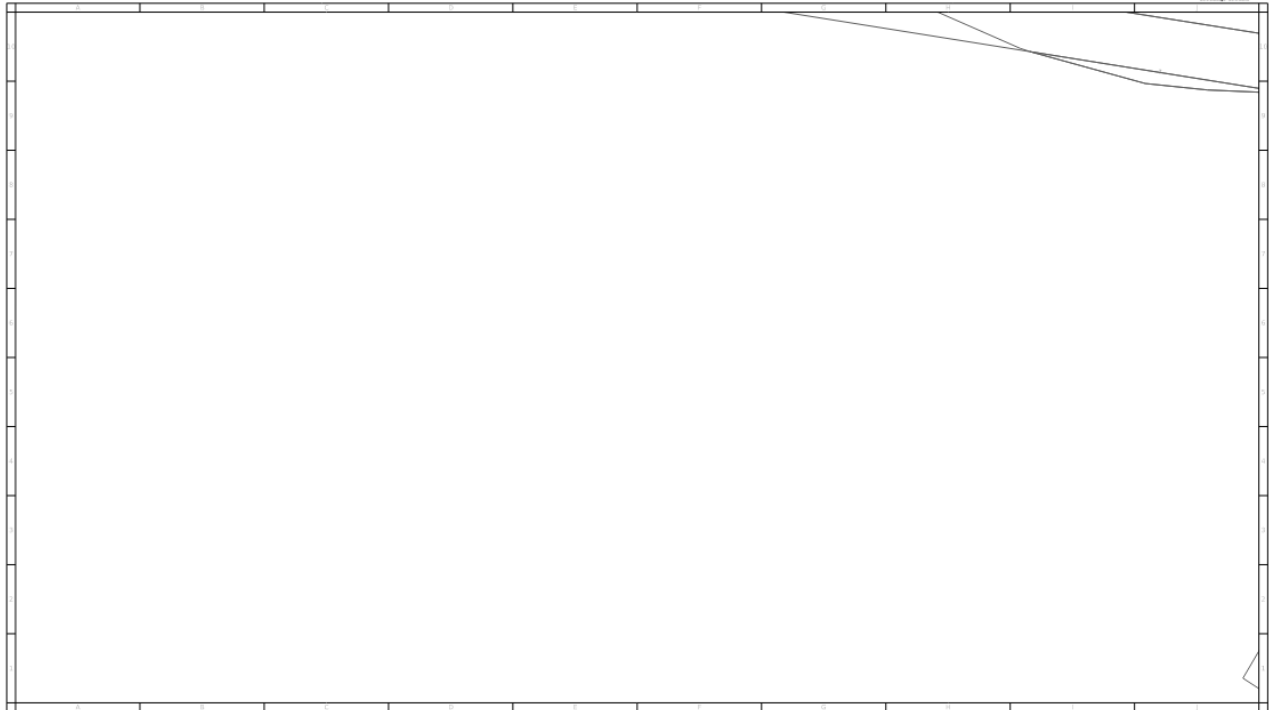
Issue Date: 29/01/2026
 BYDA Seq No: 267389817
 BYDA Job No: 52229930



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BYDA Location: 10 Roberts Rd Eastern Creek NSW, 2766

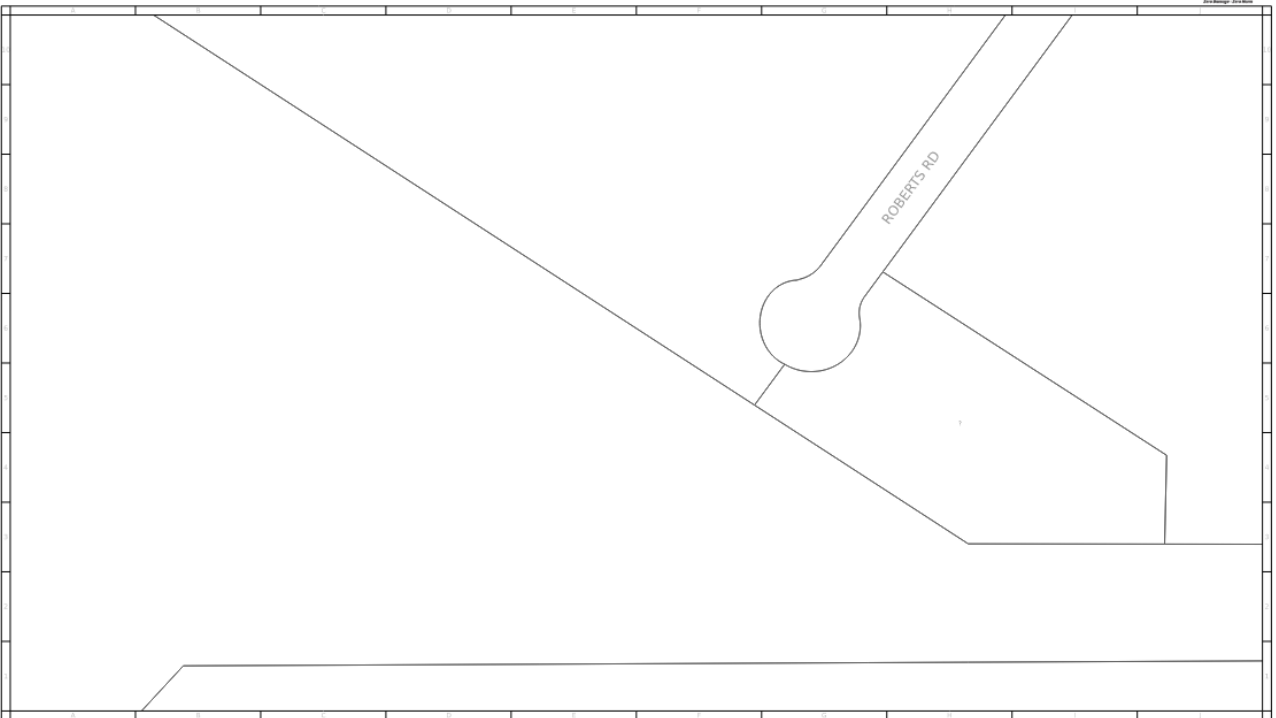


<p>ASBN 87 003 004 322</p>	<p>For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.</p>	<p>Scale: 1:2000</p>	<p>Issue Date: 29/01/2026 BYDA Seq No: 267389817 BYDA Job No: 52229930</p>
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BYDA Location: 10 Roberts Rd Eastern Creek NSW, 2766

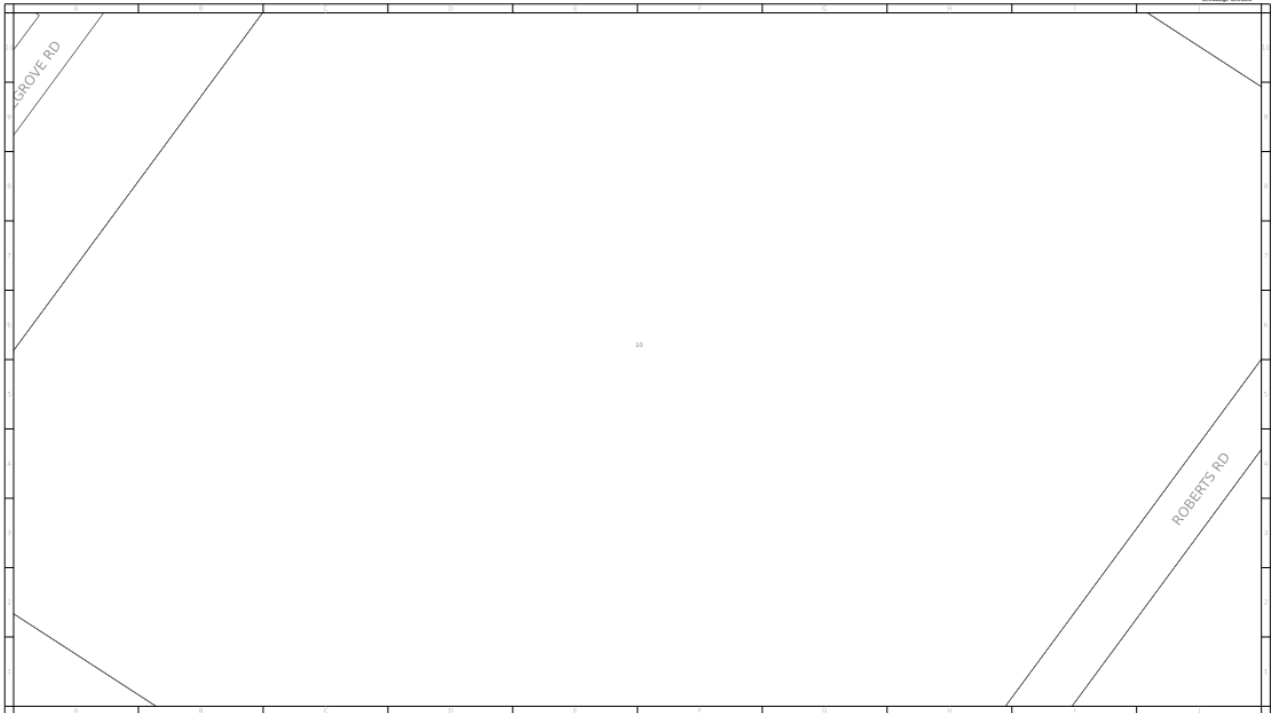


<p>ASBN 87 003 004 322</p>	<p>For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.</p>	<p>Scale: 1:2000</p>	<p>Issue Date: 29/01/2026 BYDA Seq No: 267389817 BYDA Job No: 52229930</p>
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Issue Date: 29/01/2026
 BYDA Seq No: 267389817
 BYDA Job No: 52229930

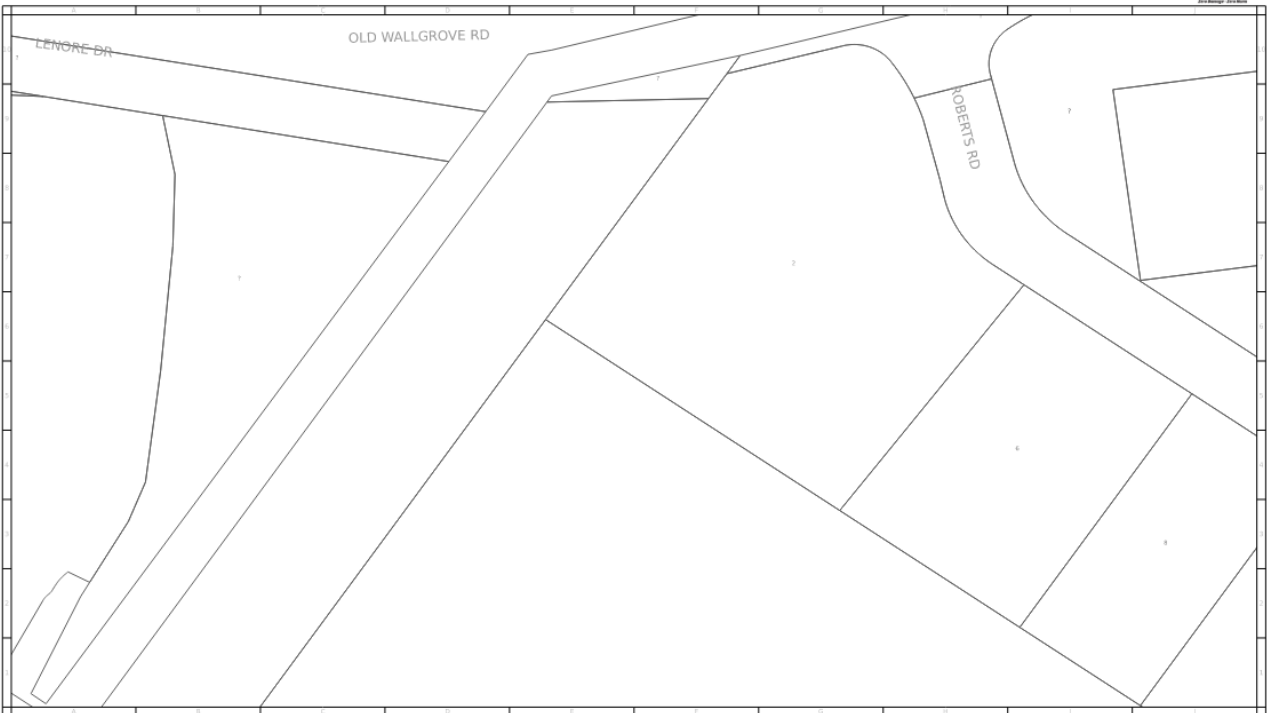
Scale: 1:2000



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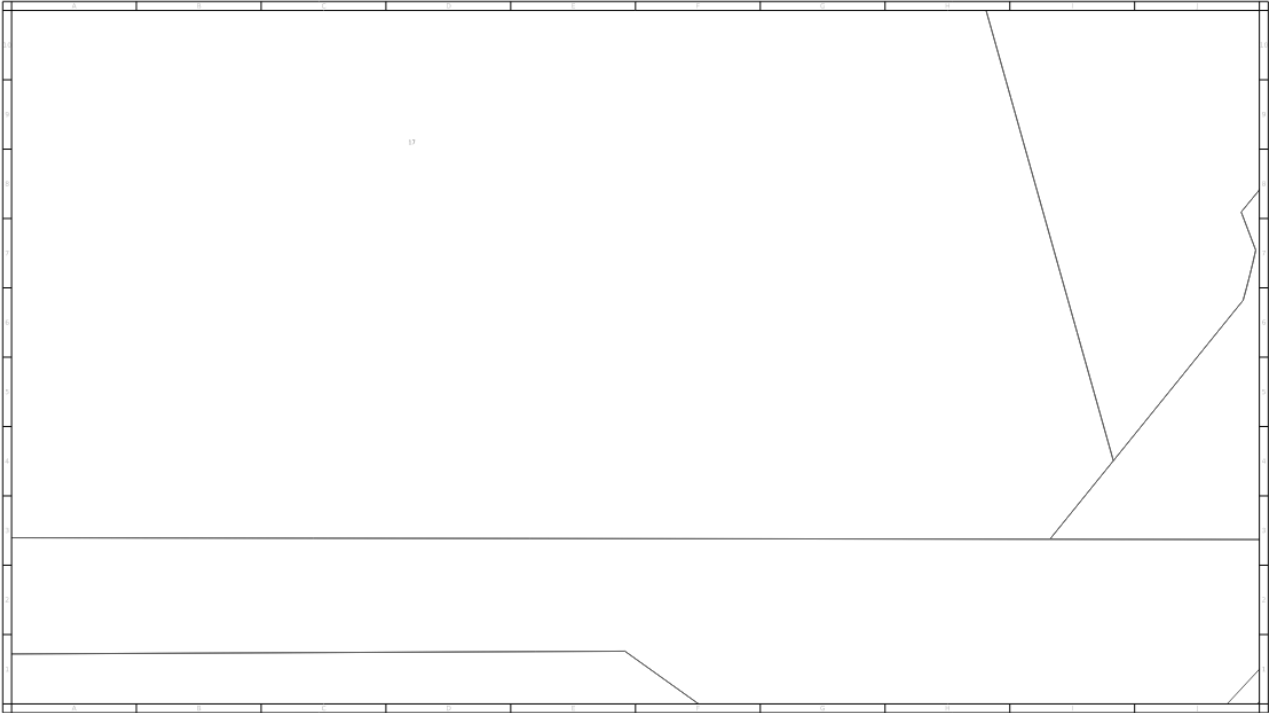
Issue Date: 29/01/2026
 BYDA Seq No: 267389817
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Scale: 1:2000



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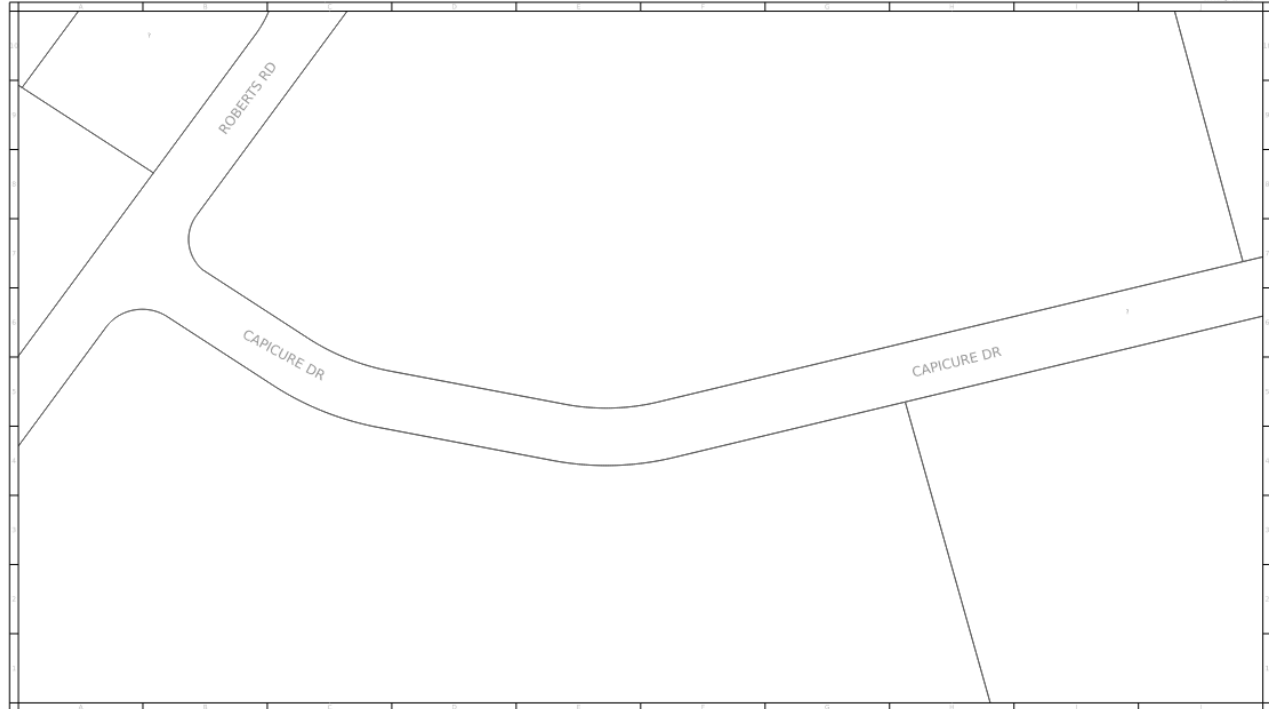
BYDA Authority: Jemena Gas Networks (NSW) BYDA Location: 10 Roberts Rd Eastern Creek NSW, 2766



<p>ABN 87 003 004 322</p>	<p>For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.</p>	<p>Scale: 1:2000</p>	<p>Issue Date: 29/01/2026 BYDA Seq No: 267389817 BYDA Job No: 52229930</p> <p>0m 10m 20m 30m 40m 50m 60m 70m 80m</p>
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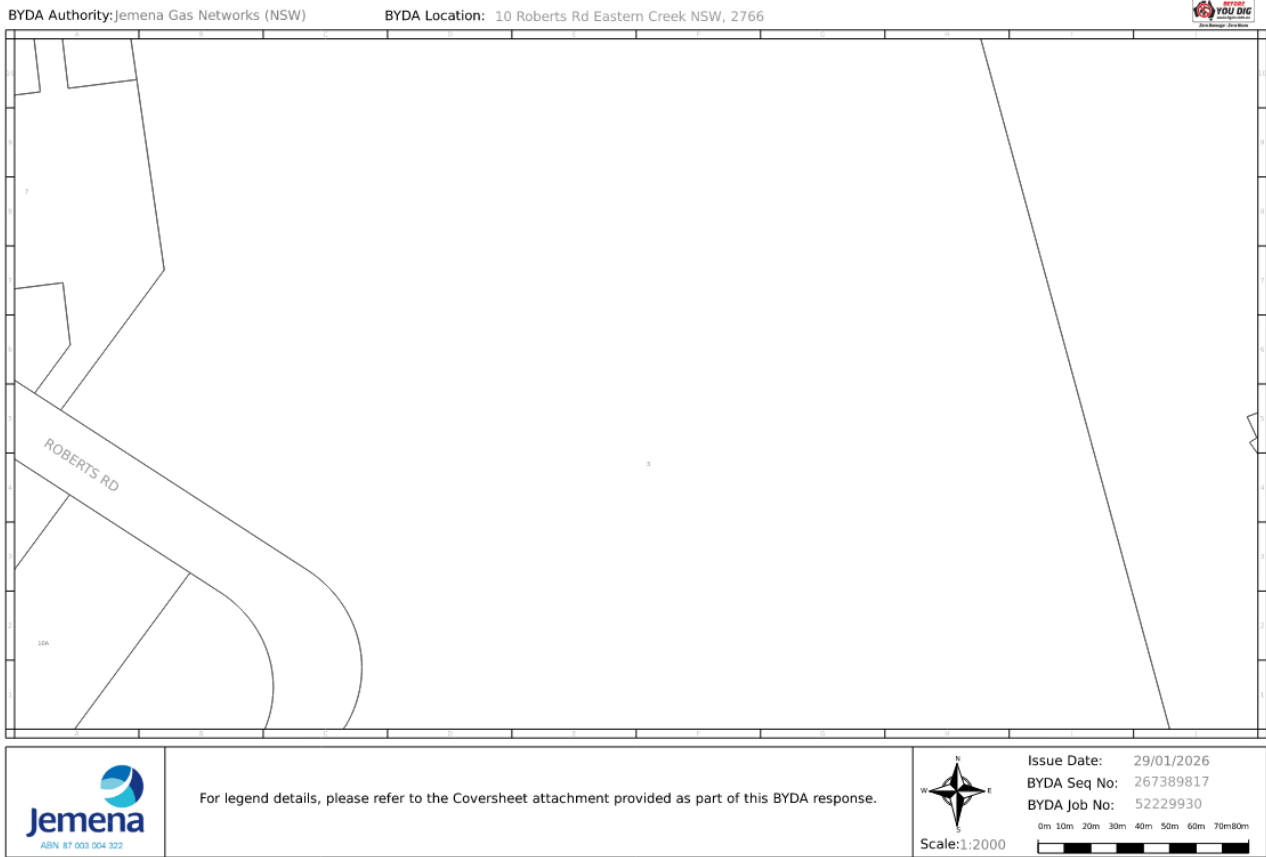
WARNING: This is a representation of Jemena Gas Networks underground assets only and may not indicate all assets in the area. It must not be used for the purpose of exact asset location in order to undertake any type of excavation. This plan is diagrammatic only, and distances scaled from this plan may not be accurate. Please read all conditions and information on the attached information sheet. This extract is subject to those conditions.

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<p>ABN 87 003 004 322</p>	<p>For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.</p>	<p>Scale: 1:2000</p>	<p>Issue Date: 29/01/2026 BYDA Seq No: 267389817 BYDA Job No: 52229930</p> <p>0m 10m 20m 30m 40m 50m 60m 70m 80m</p>
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Figure A-2 Dial Before You Dig enquiry results close ups of gas line – 29/01/2026

Appendix B LCI Consultants – Confirmation of Quantities

ITEM	INFORMATION REQUIRED	STATUS	ACTION BY	COMMENT
Batteries				
Storage	<ul style="list-style-type: none"> Architectural drawings identifying the proposed location of new and/or used batteries storage rooms onsite. Total amount (weight) of batteries for the site confirmed. This should include both those within the UPS battery rooms and (if applicable) within the data halls as in-racks. 	Open	Goodman / LCI	Refer to the attached files for information on the proposed batteries. Please be advised that battery selection is preliminary only, and subject to change pending further detailed design / client requirements. Currently, no battery racks are proposed within the Data Halls. Total weight of batteries (estimated, site ultimate capacity): 2994 tonnes
Battery Compliance and In-rack battery configuration	<p>The following information is required:</p> <ul style="list-style-type: none"> Proposed manufacture and model of battery both within the halls and battery rooms/PTUs, etc A data sheet which details the relevant cell, module and rack for each application A fully copy of the UL9540A testing results for each battery type <p>Note, where this information is not yet known or confirmed, confirmation will be required that batteries will be UL9540A tested to demonstrate no fire spread at cell, module and rack testing levels.</p> <ul style="list-style-type: none"> Confirmation the capacities and configurations can comply with EC62619:2022 <p>Confirmation from client that where Li-ion battery back-up units (BBU) are installed in a server rack as a distributed power system, it is recommended that the following recommendations from FMS 5-32 are implemented:</p> <ul style="list-style-type: none"> Maximum power capacity of 20 kWh per server rack as a distributed power configuration. No more than two shelves containing BBU modules located together in the same area of the rack. Aisle spacing between server rows is a minimum of 4 ft (1.2 m). Provide vertical barriers in all server rack rows where Li-ion distributed power systems are used or expected to be used, irrespective of the power capacity. Provide vertical barriers as follow (See Figure 2.4.4.2 for FMS-32): <ul style="list-style-type: none"> Spaced every third rack along the entire length of server rows, Use a minimum 20-gauge (0.9 mm) solid steel sheet metal for the vertical barriers on the side of every 3rd rack to limit the fire spread. Completely cover the side of the server rack and fit the rack profile. Installed in a way that will not reduce the effectiveness of the hot/cold aisle arrangement (kept to the side profile of the server racks). <p>Note, the omission of the vertical barriers may be considered based on the final chemistry type, testing and further analysis.</p>	Open	Goodman / LCI	Refer to the attached files for information on the proposed batteries. Please be advised that battery selection is preliminary only, and subject to change pending further detailed design / client requirements. It is assumed that the batteries will be UL9540 tested and fully compliant to IEC62619:2022. Currently, no batteries are proposed within the Data Halls (this is subject to future client requirements). Minor batteries (such as those used for small equipment controls, within fire control cabinets etc.) are not included.
Fire Separation requirements	Confirmation that building is a Dts 4 hour structure and that a minimum of 2-hour fire separation is allowed for data halls and battery rooms.	Open	ructures / Grimsh	

<p>Ventilation</p>	<p>An automatic mechanical ventilation system shall be provided to the data hall enclosures and battery rooms containing li-ion batteries for ventilation of smoke and noxious gases. The system capacity and design shall be determined as part of the detailed design development based on the specific make/model of battery to be utilised, but at this point is proposed to be as follows:</p> <ul style="list-style-type: none"> • Battery rooms shall be provided with ventilation in accordance with AS1668.1 and as required by FM Global data sheet 5-33. ○ Under normal operation battery room will ventilate based on Australian Standard battery room ventilation requirements. ○ In the event of a fire or activation of the of gas-detection system within the battery room, ventilation system will increase to accommodate peak ventilation volume based on venting data from likely battery vendors and to align with the FMS-33 standard of 0.75 m³/min/m² (typically 750s-1000 depending on the room size) to ensure LEL for relevant off gases are not exceeded. Noting specific battery types and room sizes may necessitate an increased rate. • Data hall ventilation: <ul style="list-style-type: none"> ○ Noting that FM Global data sheet 5-32 does not require mechanical ventilation to data halls where in-rack batteries are provide. Regardless, dedicated automatic ventilation is proposed to be provided to the data halls to assist with fire brigade intervention. Exact rates and function to be determined during design development, but broadly the minimum requirements shall be as follows: <ul style="list-style-type: none"> ○ The system is to activate upon activation of the sprinkler system in the respective area or the manual controls, as required by FMS-32. ○ System capacity must be capable of exhausting at a rate of at least 1 enclosure air change per hour. ○ All fans, motors and cabling must comply with AS1668.1 for a smoke exhaust system ○ AUTO/ON/OFF switches must be located at the FFCP. ○ The system shall be considered an essential fire safety service <p>Note, the requirements and performance of the ventilation system has been driven out of discussions to date with the fire brigade and shall be subject to site specific discussions with the brigade for this project.</p>	<p>Open</p>	<p>LCI</p>	<p>Confirmed, refer to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932</p> <p>Confirmed, refer to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932</p>
<p>Off gas detection</p>	<p>Confirmation that off gas detection will be provided within battery rooms/PTUs, etc and the proposed type ('li-ion tamer', etc).</p>	<p>Open</p>		<p>Confirmed, refer to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932</p>
<p>Contaminated water storage</p>	<p>The water run-off from sprinkler activation and brigade hydrant operation shall be contained within the facility due to potential contaminants. Strategy and volume to be agreed with the stakeholder team including Goodman.</p>	<p>Open</p>		<p>This is noted, refer to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932</p>

ITEM	INFORMATION REQUIRED	STATUS	ACTION BY	COMMENT
Diesel				
<i>Diesel fuel distribution and tank layout</i>	Confirmation required as to configuration and capacity of tanks onsite (i.e total volume onsite). Where proprietary tanks are proposed (i.e. fire rated tanks) data sheets of these tanks shall also be provided. If alternative fuels are proposed (HVO, etc) these shall also be confirmed for type and quantity.	Open	LCI	Anticipated ultimate site fuel capacity is 4.1million litres. Tanks shall be provided in the services zone (outdoors) between the 2 x Data Centre buildings. Data Sheets not available at this stage. Generators shall be proposed as HVO compatible, but currently there is no proposal for HVO integration. Refer to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932
<i>Mechanical Ventilation</i>	Details the ventilation system design for the internal tank rooms/chambers, noting that the ventilation shall comply with the requirements of AS1668.2:2012 or AS1940:2017 (whichever is more onerous)	Open	LCI	Tanks are proposed outside, either above ground or buried (pending further design development).
<i>Bundling</i>	Details on bunding where applicable to comply with AS1940:2017. Note where internal tank chambers are utilised it is recommended that the bunding also be designed to retain sprinkler water discharge in addition to the required tank LOC volumes.	Open	Structures/Grimshaw	Bunding to comply with AS1940. Tanks are proposed to be located outdoors.
Table 4: Generators				
ITEM	INFORMATION REQUIRED	STATUS	ACTION BY	COMMENT
<i>Generator type</i>	Confirmation of the proposed generators onsite and the standards to which they are capable of comply with.	Open	LCI	Generators shall form part of OSE (Owner Supplied Equipment), and subject to final confirmation. Generators are to comply with all relevant Australian and IEC standards.
<i>Fuel Configuration</i>	Do generators have day tanks (assuming 1000L or less) or are they fed directly from the belly tank?	Open	LCI	Confirmed, generators are proposed with Day Tanks. With a Safe Fill level of 990L. There are no Belly tanks proposed, the site is proposed with a centralized fuel storage and delivery system. Referr to GC-81 for LCI Concept Design Documentation: https://us02.procore.com/562949955031782/project/generic_tool/show/562949956338277?subtab=item&tool_id=562949953430932
<i>Detection/suppression</i>	Confirmation of the proposed measures within the generators enclosure/room (water mist, flame or heat detection, etc)	Open	LCI	Generators proposed with water misting.
Table 5: Fire Services				
ITEM	INFORMATION REQUIRED	STATUS	ACTION BY	COMMENT
Fire Hydrants				
<i>Performance/specification</i>	Confirmation on the proposed configuration and performance of the hydrant system including at a minimum the following: <ul style="list-style-type: none"> Number of hydrants design to operator to comply with AS2419.1:2021 and AS1940:2017 Proposed booster and pump room location, including the configuration of any required hardstands Configuration of water supply (i.e tanks, mains, combined with sprinklers, etc). 	Open	LCI	1. design caters for three (3) hydrants to flow simultaneously per AS2419.1-2021 appendix C, if additional hydrants are required on top of AS2419 requirements per DG report, water storage will need to increase. 2. Fire hydrant and sprinkler boosters located adjacent to the site entry points. Booster configuration is as follows: 8 x boost points, 8 x towns mains suction points and 2 x large bore suctions. Main entry point is the hardstand. Fire pump room is located at the front of site with access from an open space using dual elec pumps. 3. Water storage strategy is a single water supply full size fire tanks (no input from towns main) Current volume is 2 x 348 kL effective capacity which allows for 60min of sprinkler discharge at the highest sprinkler density and 4-hours of fire hydrant flow.
Sprinklers				
<i>Performance</i>	<ul style="list-style-type: none"> Confirmation from the client that the sprinkler requirements from FMS-32 and FMS-32 with respect to design density and area of operation can be adopted: Battery rooms - 12.2mm/min over the room in accordance with FMS-33 Data halls - 8mm/min over 330 m² in accordance with FMS-32. Rooms used for storage of batteries (new/used) - High hazard Storage risk Proposed booster and pump room location, including the configuration of any required hardstands Configuration of water supply (i.e tanks, mains, combined with sprinklers, etc). 	Open	LCI	1. Battery room sprinkler density is per FM global data sheets 5-33 2. Data halls (both hot and cold aisle) is per FM global DS 5-32. 3. Battery sotrage rooms are too per FM DS 5-33 4. Booster configuration is as follows: 8 x boost points, 8 x towns mains suction points and 2 x large bore suctions. Main entry point is the hardstand. Fire pump room is located at the front of site with access from an open space using dual elec pumps. 5. Water storage strategy is a single water supply full size fire tanks (no input from towns main) Current volume is 2 x 348 kL effective capacity which allows for 60min of sprinkler discharge at the highest sprinkler density and 4-hours of fire hydrant flow.

Figure B-1 RFI register Items (28/01/2026)

UPS INFORMATION

Building 1	
No. of (IT) Electrical Rooms	60
UPS per Room (@1500kW)	2
Total No. of UPS (IT)	120
No. of (MECH) Electrical Rooms	30
UPS per Room (@1250kW)	2
Total No. of UPS (MECH)	60
No. of ADMIN Rooms	1
UPS per Room (@1250kW)	1
Total No. of UPS (ADMIN)	1
Total No. of 1500kW UPS per Building	120
Total No. of 1250kW UPS per Building	61
Building 2	
No. of (IT) Electrical Rooms	114
UPS per Room (@1500kW)	2
Total No. of UPS (IT)	228
No. of (MECH - 2 Stack) Electrical Rooms	12
UPS per Room (@1250kW)	2
Total No. of UPS (MECH - 2-stack)	24
No. of (MECH - 3 Stack) Electrical Rooms	30
UPS per Room (@1500kW)	2
Total No. of UPS (MECH - 3-stack)	60
No. of ADMIN Rooms	2
UPS per Room (@1250kW)	1
Total No. of UPS (ADMIN)	2
Total No. of 1500kW UPS per Building	228
Total No. of 1250kW UPS per Building	26
Total No. of 1500kW UPS (site)	408
Total No. of 1250kW UPS (site)	87

BATTERY INFORMATION

Building 1	
No. of (IT) Electrical Rooms	60
Battery Racks per Room	13
Total No. of Battery Racks (IT)	780
No. of (MECH - 2 Stack) Electrical Rooms	30
Battery Racks per Room	10
Total No. of Battery Racks (MECH - 2 Stack)	300
No. of ADMIN Rooms	1
Battery Racks per Room	5
Total No. of Battery Racks (ADMIN)	5
Total No. of Racks per Building	1085
Weight per Rack (kg):	970
Total weight of battery racks (kg):	1052450
Building 2	
No. of (IT) Electrical Rooms	114
Battery Racks per Room	13
Total No. of Battery Racks (IT)	1482
No. of (MECH - 3 Stack) Electrical Rooms	30
Battery Racks per Room	13
Total No. of Battery Racks (MECH - 3 Stack)	390
No. of (MECH - 2 Stack) Electrical Rooms	12
Battery Racks per Room	10
Total No. of Battery Racks (MECH - 2 Stack)	120
No. of ADMIN Rooms	2
Battery Racks per Room	5
Total No. of Battery Racks (ADMIN)	10
Total No. of Racks per Building	2002
Weight per Rack (kg):	970
Total weight of battery racks (kg):	1941940
Total quantity of Battery Racks (site)	3087
Total weight of Battery Racks (site, kg)	2994390
Total weight of Battery Racks (site, tonne)	2994

Table B-1 UPS and Battery Information (27/01/2026)