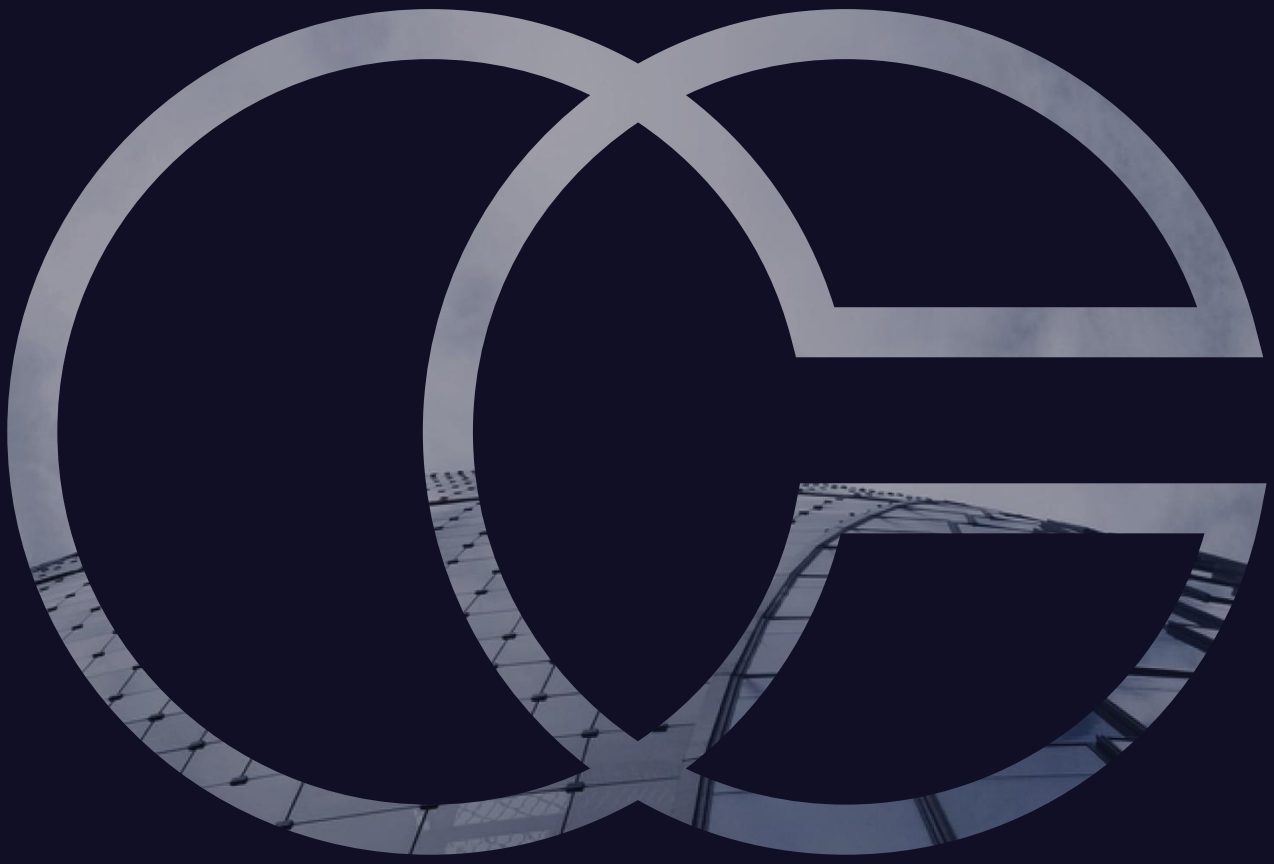

Leading the way with fire safety

Preliminary Risk Screening

Mamre Road Data Centre Campus
706-752 Mamre Road, Kemps Creek NSW 2178

Client: Plan Project Management

26 June 2026
Revised Issue
Report No. F202757_PRS_05

CORE engineering

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Report Revision Details

Report Revision History

Rev	Date issued	Reason for Issue	Prepared by	Reviewed by	Verified by
00	30/09/25	Draft Issue for Comment	**Ben Windsor** **Alex Chubb** *GradDip Fire Safety, BEng Mech MIEAust*	**Laurence Kwong** *BEng (Chemical) (Hons) MEng (Building Fire Safety and Risk Engineering) MIEAust, CPEng, NER*	**Sandro Razzi** *BE (Building), Grad. Dip. (Performance Based Building and Fire Codes), FIEAust, CPEng 2180287*
01	22/10/25	Initial Issue	**Alex Chubb** *GradDip Fire Safety, BEng Mech MIEAust*		
02	7/11/25	Revised Issue	**Ben Windsor** *BEng (Mech) (Hons)*	**Alex Chubb** *GradDip Fire Safety, BEng Mech MIEAust*	**Sandro Razzi** *BE (Building), Grad. Dip. (Performance Based Building and Fire Codes), FIEAust, CPEng 2180287*
03	09/12/25	Revised Issue			
04	17/06/26	Revised Issue – Amended SSDA scheme			
05	26/06/2026	Revised Issue – Amended SSDA scheme			

Document Revision History

Rev	Date issued	Comment
00	30/09/2025	Draft Issue for Comment
01	22/10/2025	Initial Issue including stakeholder feedback. Changes being as follows: • Items updated: ○ Client details ○ Drawings throughout updated to the SSDA set ○ Section 4.2 – Diesel quantities updated ○ Section 4.3 – Inclusion of peak battery discharge rates • New items: ○ Section 3.4 - Sensitive Receivers ○ Section 4.5 - Alternative Locations for Identified Hazards ○ Section 6 - Consideration of Relevant Standards and Datasheets Required by the SEARs
02a	07/11/2025	Revised issue including the following changes: • Items Updated: ○ Section 4.4 – Network Substation transformers included. ○ Section 5.4 – Updated conclusion of PRS ○ Report updated to align with planners and client requirements
03	09/12/2025	Revised issue including the following • Items Updated – ○ Section 2.3 – Source information ○ Section 3 – Site and Lot description updated
04	17/06/2026	Revised Issue for the amended SSDA Scheme including the following changes: • Items updated: ○ Drawings throughout updated to the SSDA scheme ○ Section 3.2 and 3.3 – Updated building design and phasing ○ Section 4.2 – Diesel quantities and storage locations updated ○ Section 4.3 – Battery quantities and storage locations updated ○ Section 4.4 – Transformer sizing, quantities and location changes ○ Appendix B – Updated DG information ○ Report updated to new CORE formatting style
05	26/06/2026	Revised Issue including stakeholder feedback including the following changes: • Items updated: ○ Table 1-2 added in Section 1.1 – Updated capturing relevant agency comments and responses to previous SSDA submission ○ Section 2.1 and Executive Summary – Updated to capture project history of previous SSDA submission and subsequent design changes.

Executive Summary

CORE Engineering Group has been engaged by to undertake a Preliminary Risk Screening (PRS) to accompany the State Significant Development Application (SSDA) for the proposed Data Centre located at 706-752 Mamre Road, Kemps Creek NSW 2178 The Proposal site is located within the Mamre Road Precinct (MRP). The MRP is located within the Western Sydney Employment Area. The proposed site is a data centre campus comprising:

Approximately 12 shells across four-storey data centre buildings (3x four shells), including six technical office buildings, plus a campus office.

- Incoming and internal electrical substations and associated infrastructure
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

Submissions were received following the public exhibition period on the SSDA on the Preliminary Risk Screening (PRS) report (F202757_Mamre Road Data Centre Campus_PRS_03, dated 09/12/2025), including from the Department of Planning, Housing and Infrastructure (DPHI), Fire and Rescue NSW (FRNSW) and the NSW Environment Protection Authority (EPA). Direct responses to these submissions are included in Section 2.1. To respond to these submissions and boarder submissions on the remainder of the SSDA, an amended design has been developed, which included an overall reduction in the scale of development and a revised layout to improve the efficiency of the design and further minimise the potential impacts on adjacent receivers.

A review of the proposed hazardous goods stored within the proposed data centre located at 706-752 Mamre Road, Kemps Creek NSW 2178 was conducted against the requirements of Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) and Work Health and Safey 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 Safey 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

Further to the above, as required by the SEARs, the assessment demonstrated consideration and relevant implementation 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 undertaking during the project development. In addition, requirements from Protection of the Environment Operations Act 1997 No 156 are expected to be applicable given the site exceeds the relevant thresholds under the Act.

Table of Contents

1. Introduction

1.1 Overview

This Preliminary Risk Screening (PRS) has been undertaken for the proposed data centre located at 706-752 Mamre Road, Kemps Creek NSW 2178.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Mamre Road Data Centre Campus (SSD-92743706) issued on 30th September 2025

Specifically, this report has been prepared to respond to the Agency Advice:

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

Item	Description of Requirement	Section Reference (This Report)
11. Hazards and Risk	• Details regarding the location and number of any proposed back-up generators, 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. • Detailed justification for the proposed location of any back-up generators, back-up fuel storage tanks and lithium-ion or other battery chemistries with regard to adjacent sensitive land uses, including a detailed options analysis considering alternative locations within the site.	• Section 4 • Section 3.4
	• 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"	• N/A – Site not considered potentially hazardous – Refer Section 5.4
	• 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.	• Section 6

Submissions were received following the public exhibition period of the SSDA on the Preliminary Risk Screening (PRS) report (F202757_Mamre Road Data Centre Campus_PRS_03, dated 09/12/2025), including from DPHI, the Council and the NSW Environment Protection Authority (EPA). Responses to these submissions and how these have been addressed in the are included in the following table.

Table 1-2: Relevant Agency Comments and Respones

Submission	Formal Response	Section Reference (This Report)
Fire and Rescue NSW (FRNSW)		
1.Prior to construction a Fire Safety Study (FSS) is developed in accordance with the requirements of the Hazardous Industry Planning Advisory Paper (HIPAP) No.2 and submitted to FRNSW for review. • The FSS is to be used to guide the design and as such it is FRNSW Position that the FSS be developed to the satisfaction of FRNSW prior to any further submission being made to FRNSW; this includes: an Initial Fire Safety Report (IFSR) and / or Performance-Based Design Brief / Fire Engineering Brief Questionnaire (FEBQ). • The FSS should be prepared consistent with the relevant FRNSW Fire Safety Guidelines and FRNSW Technical Information Sheets.	A Fire Safety Study will be prepared in accordance with HIPAP No. 2 and submitted to FRNSW prior to relevant construction. To be addressed as a condition of consent.	N/A
2. Prior to occupation or commissioning an Emergency Plan (EP) is developed for the site in accordance with HIPAP No.1.	An Emergency Plan will be prepared prior to occupation/commissioning in accordance with HIPAP No. 1. To be addressed as a condition of consent.	N/A
3. Prior to occupation or commissioning an Emergency Services Information Package (ESIP) is developed for the site in accordance with FRNSW fire safety guideline – Emergency services information package and tactical fire plans.	An ESIP will be prepared prior to occupation/commissioning. Direct engagement with FRNSW via FireSafety@fire.nsw.gov.au referencing FRN25/2717. To be addressed as a condition of consent.	N/A
Penrith City Council – 4. Diesel/BESS		
(b) The Preliminary Risk Screening prepared by Core Engineering Group dated 9 December 2025 (Ref: F202757_PRS_03) goes on to state that the site will comply with; the FM Global Property Loss Prevention Data Sheet 5-32 – Data Centres and Related Facilities; 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; and AS 1940 – Storage and handling of flammable and combustible liquids.	Noted. Compliance with the relevant portions of the listed standards is confirmed by the Preliminary Risk Screening and will be agreed through consultation with FRNSW as part of the FSS process.	Refer Section 6.2
(c) The report concludes that "it is considered that the proposed development with suitable engineering and design controls in place, would not be considered to be an offensive or	Detailed engineering and design controls for hazardous materials management are provided within the update submission including but not limited to this report.	Refer Section 6.1

Submission	Formal Response	Section Reference (This Report)
hazardous development on site." No detail has been provided as to how this will be achieved. Further scrutiny should occur by DPHI as to how the premises will achieve this in practice.		
NSW EPA		
Waste Storage No details on likely quantity of waste lithium-ion batteries to be stored on-site at any one time.	Detailed in Waste and Resource Recovery Management Plan by MRA Consulting group Version 2 dated 23/06/2026	N/A

1.2 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) (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.

1.2.1 Preliminary Hazard Assessment

A PHA has not been prepared for this site, if one was required it 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.

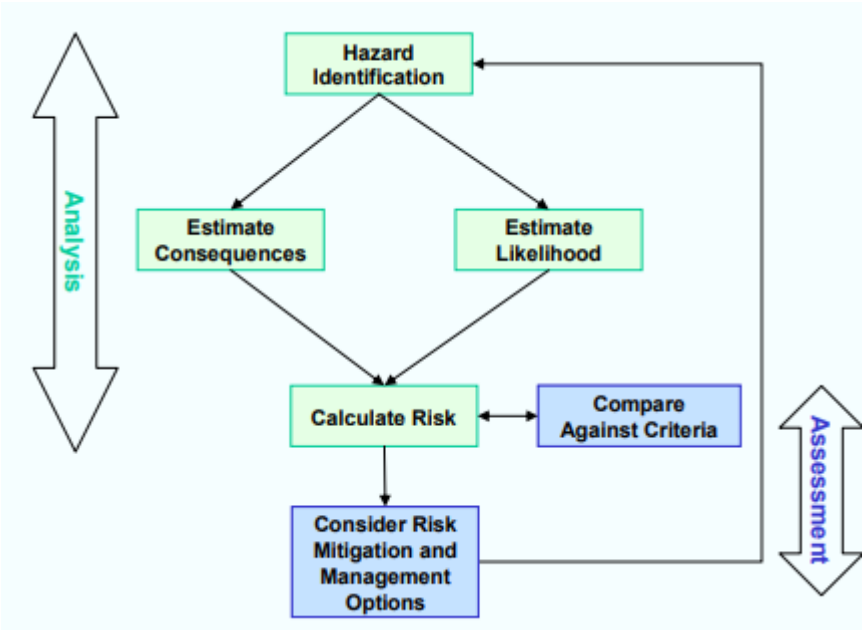


Figure 1-1: Basic Methodology for Hazard Analysis (HIPAP 6) [7]

2. Project Scope

2.1 Overview

CORE Engineering Group has been engaged to undertake a Preliminary Risk Screening (PRS) to accompany the State Significant Development Application (SSDA) for the proposed Data Centre located at 706-752 Mamre Road, Kemps Creek NSW 2178 The Proposal site is located within the Mamre Road Precinct (MRP). The MRP is located within the Western Sydney Employment Area. The proposed site is a data centre campus comprising:

- Approximately 12 shells across four-storey data centre buildings (3x four shells), including six technical office buildings, plus a campus office.
- Incoming and internal electrical substations and associated infrastructure
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

Submissions were received following the public exhibition period on the SSDA on the Preliminary Risk Screening (PRS) report (F202757_Mamre Road Data Centre Campus_PRS_03, dated 09/12/2025), including from the Department of Planning, Housing and Infrastructure (DPHI), Fire and Rescue NSW (FRNSW) and the NSW Environment Protection Authority (EPA). Direct responses to these submissions are included in Section 2.1. To respond to these submissions and boarder submissions on the remainder of the SSDA, an amended design has been developed, which included an overall reduction in the scale of development and a revised layout to improve the efficiency of the design and further minimise the potential impacts on adjacent receivers.

2.2 Relevant Stakeholders

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

Table 2-1: Relevant Stakeholders

Role	Name	Organisation
Architects	Borga Yucel Iris Lyu Damien Kwan	Woolpert
BCA Consultant	Alex Ciecko Heath McNab	MBC
Bushfire Consultant	Lew Short Rowena Dudgeon	Blackash
Client Representative	Adam Pavolvic Jeffry Kusnan	Plan Project Management
Design Lead	Juan Lewis Sylvester Kourie	Aurecon
Electrical Engineer	Josh Clancy Andreas Laubi	
Fire Services Engineer	Maryam Moghaddas	
Fuel Systems Engineer	Stuart Hunt	
Mechanical Engineer	David Robinson	
Fire Risk Engineer	Alex Chubb Ben Windsor Sandro Razzi	CORE Engineering Group
Security Consultant	Andreas Demetriou	Security Consulting Group (SCG)

Structural Engineer	Patrick Shephard	WSP

It should be noted that at times some parties may have a vested interest in the outcome of the Preliminary Risk assessment. 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 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 Aurecon dated 09/06/2026 – Refer Appendix B
- Dangerous goods quantities summary provided by Aurecon by email on 11/06/2026 - Refer Appendix B
- NCC Assessment Report No. 25000735 prepared by MBC Group
- Bushfire Hazard Assessment by Blackash Bushfire Consulting Version 1.3 dated 12/06/2026
- Waste and Resource Recovery Management Plan by MRA Consulting group Version 2 dated 23/06/2026
- Architectural Plans provided by Greenbox Architecture as indicated in Table 2-2 below.

Table 2-2: Drawings

Drawing No.	Description	Issue	Date
SSDA-A-0100	MASTER SITE PLAN	04	05/06/2026
SSDA-A-0030	OVERALL STAGE AND PHASE DIAGRAM	03	05/06/2026
SSDA-A-0101	OVERALL GROUND FLOOR	04	05/06/2026
SSDA-A-0102	OVERALL LEVEL 1	03	05/06/2026
SSDA-A-0103	OVERALL LEVEL 2	03	05/06/2026
SSDA-A-0104	OVERALL LEVEL 3	03	05/06/2026
SSDA-A-0105	OVERALL LEVEL 4	03	05/06/2026
SSDA-A-0131	SITE SECTIONS - X1/X2	03	05/06/2026

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
- 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 (if required) 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.

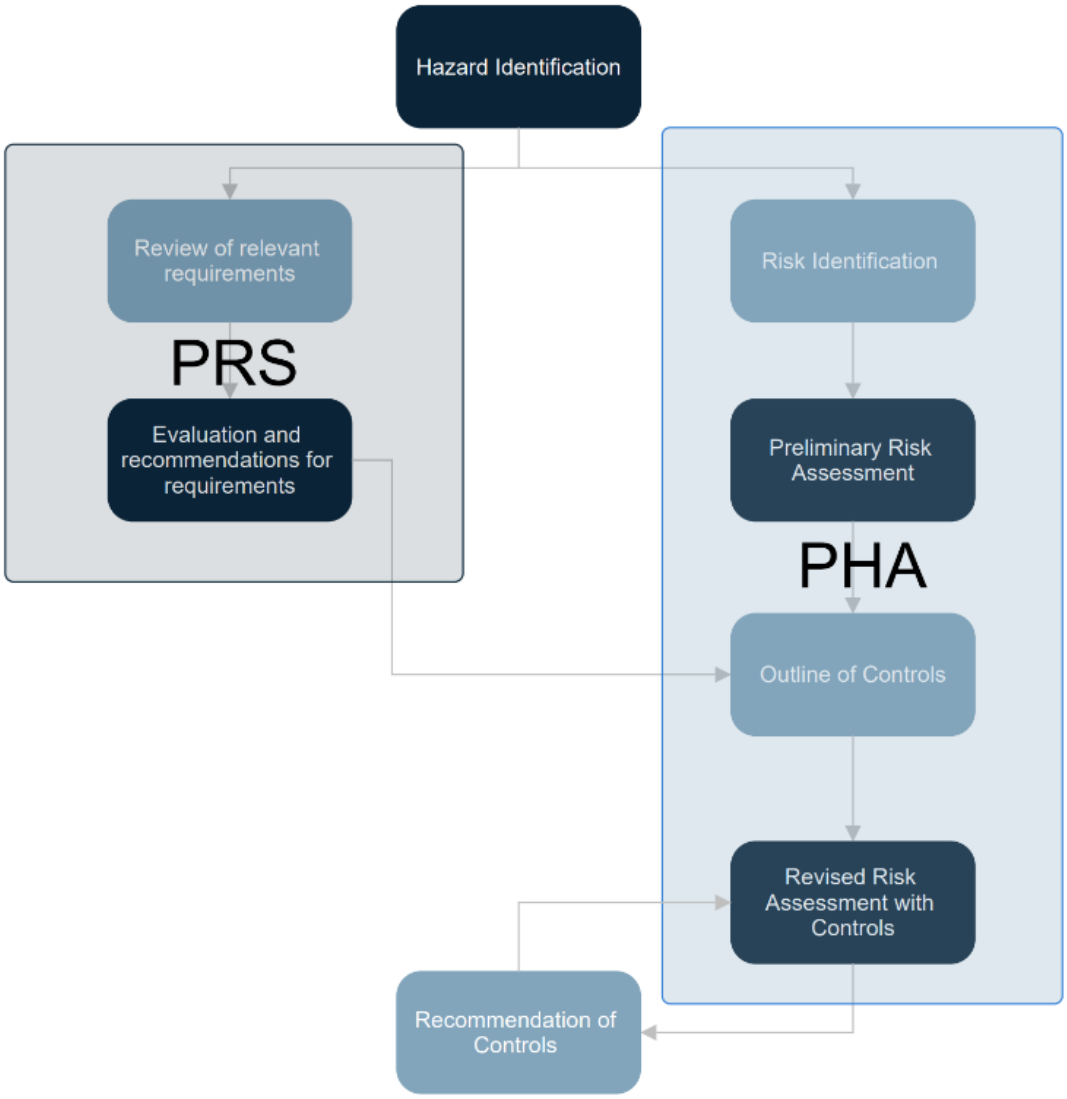


Figure 2-1: Flow Chart of Methodology

2.5 Limitations and 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 Site is located within the suburb of Kemps Creek in the Penrith LGA and forms part of the MRP. The MRP was subject to a rezoning in mid-2020 and provides 850 hectares of industrial land and 95 hectares of environmental conservation areas. The purpose of the MRP is to promote economic development and employment through the delivery of major industrial facilities.

The Site is situated at the intersection of Mamre Road and Bakers Lane (the future Southern Link Road which will be delivered by Others) and has a 1.1-kilometre frontage to Bakers Lane and a 490-metre frontage to Mamre Road. The site is located 8.5 kilometres northeast of the Western Sydney Airport, 20 kilometres from the Parramatta CBD and 40 kilometres from the Sydney CBD. The site is currently vacant, with eleven (11) dams and small patches of vegetation. Much of the site is classified as urban-capable certified land, with only a small portion at the northeast of site identified as containing biodiversity values. The site is zoned IN1 General Industrial pursuant to State Environmental Planning Policy (Industry and Employment) 2021 (Industry and Employment SEPP) and a small portion of the site adjoining Mamre Road is zoned as SP2 Infrastructure for future acquisition and upgrades of Mamre Road.

Figure 3-1: Site Location (NearMaps)

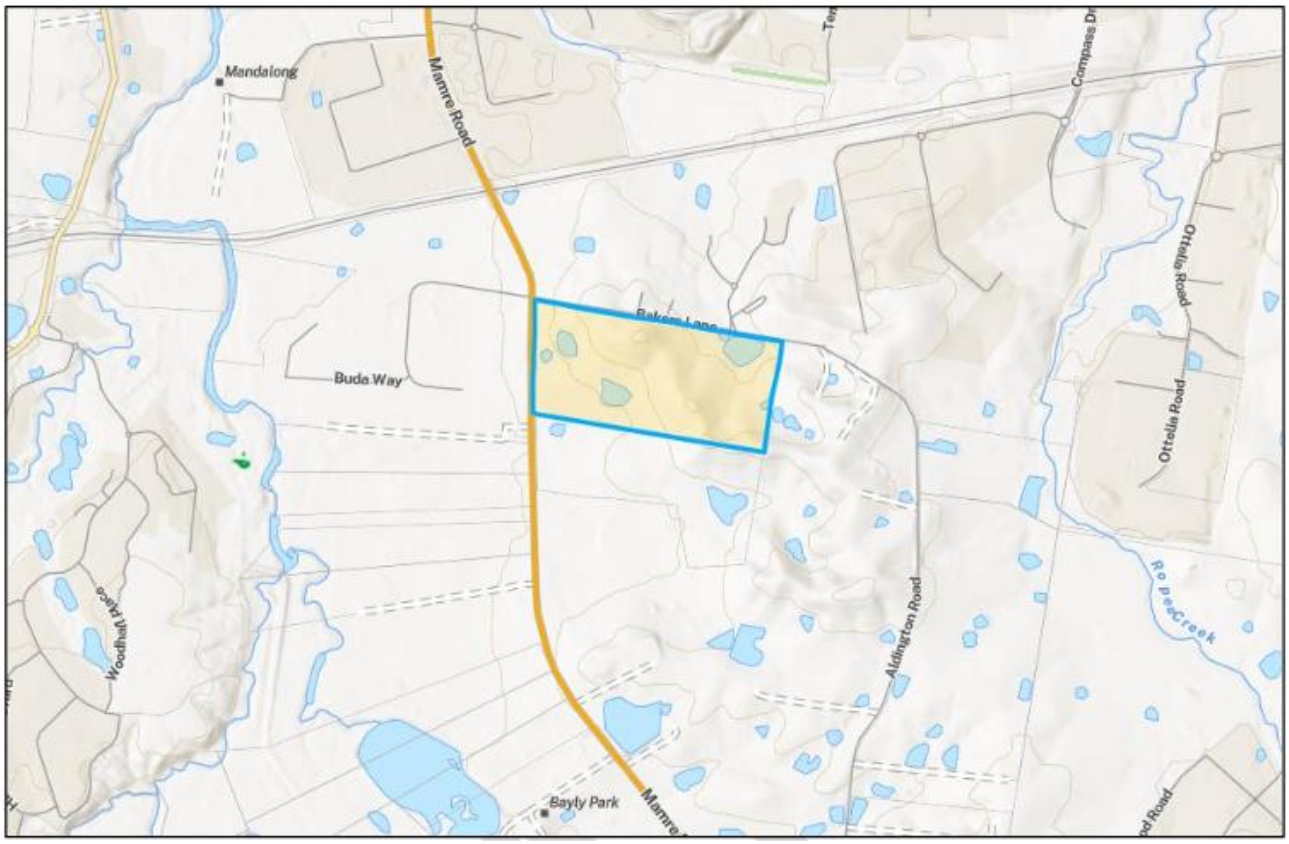


Figure 3-2: Cadastre Map (Source: NSW Explorer, 2025)

3.2 Site Layout

The proposed development is a campus site of 3 data centre buildings that will be active 24/7. As identified in the BCA assessment report, each building consists of 4 floors with an effective height >25 m.

The proposed data centres consist of 4 data halls per floor (except Ground Floor that contains 2 data halls), with an office /back of house area located on ground floor of the building. Each building is split into shells, which are one 'stack' of data halls i.e. the 4 data halls located one above the other (Figure 3-5). Each building contains 4 such shells (north and south shells contain 3 data halls), as such there are a total of 42 data halls within the campus, 14 per building.

Each shell is served by power backups which include diesel generators (including a large quantity of diesel to support their operation) and battery backups which are required to keep the halls active in the event of a power outage. Each individual Data Hall will be served by 14 generators and 14 PTUs (rooms containing Battery Cabinets). Each building is served by a chiller and plant gantry to the south (Figure 3-3).

Each building is served by 48 internal bulk storage diesel tanks to supply the generators within the data hall buildings, located on the Ground Floor of the data hall building within fire rated tank chambers, eight (8) per building, as shown in Figure 4-1. Additionally, 20 bulk storage diesel tanks to supply generators within the chiller gantries located on Ground floor of the chiller gantry within fire rated tank chambers, six (6) per building as shown in Figure 4-2.

Each building is served by external substations to with 4 high voltage transformers containing insulating/cooling oil. Additionally, through a 'Dial Before You Dig' enquiry, Jemena Gas Network Protection has confirmed that there is a medium pressure pipeline on the far side of Bakers Lane, although this is not of a sufficient pressure to trigger requirements of Planning Circular – PS 24-005 Development near high pressure pipelines. (Appendix A).

There is proposed to be a large high voltage substation located to the southwest of site serving to step voltage down before the individual substations serving the buildings. Additionally, a Static Synchronous Compensator (STATCOM) is located on the southwest corner of the site to regulate the voltage.

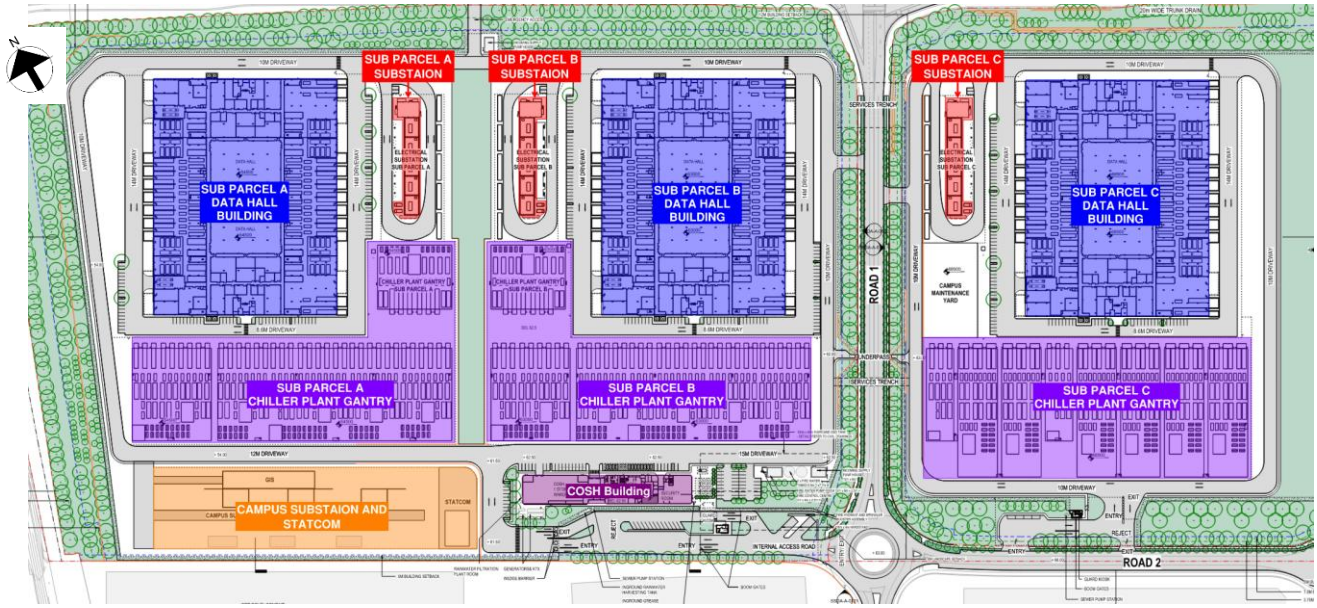


Figure 3-3: Site Plan

Figure 3-4: 3D Render of Site (Axonometric - SW)

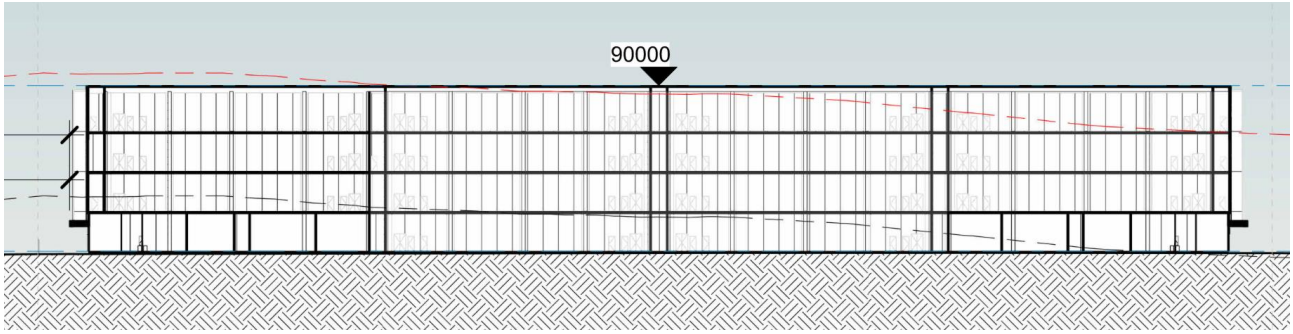


Figure 3-5: Section View of Data Hall Building

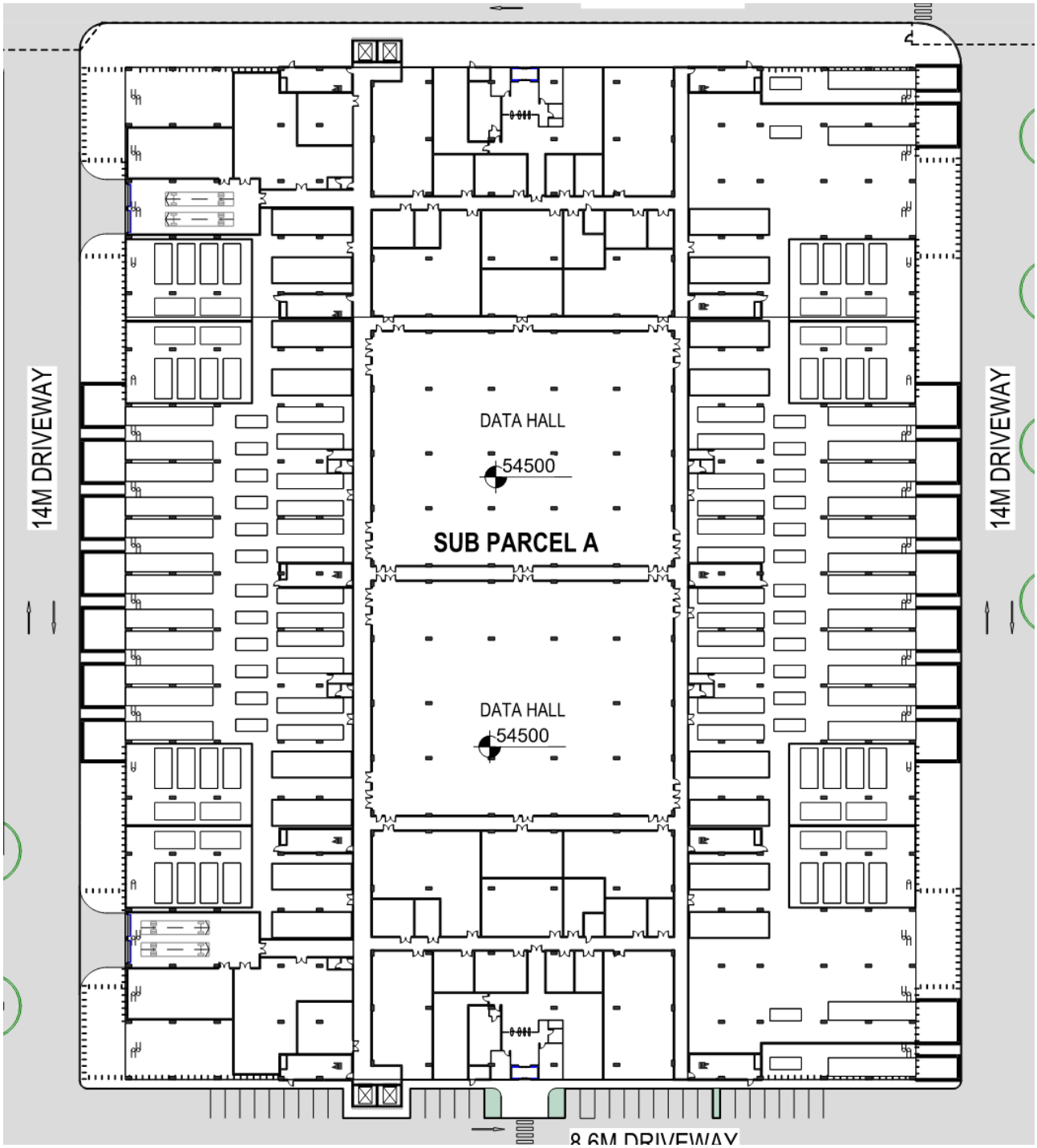


Figure 3-6: Ground Floor Layout of Data Hall Building – Typical per Sub Parcel

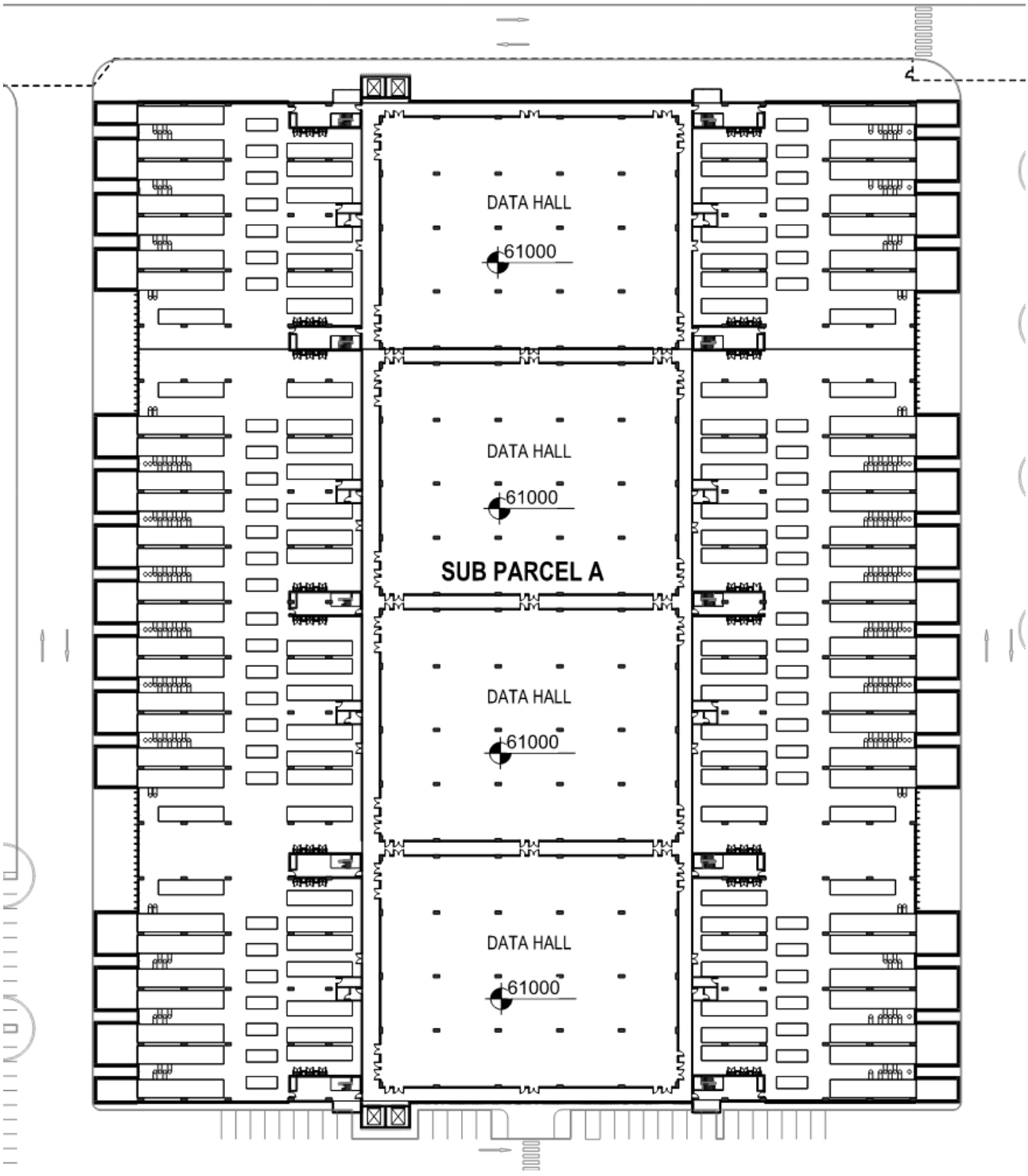


Figure 3-7: Level 1 Layout of Data Hall Building – Typical per Sub Parcel

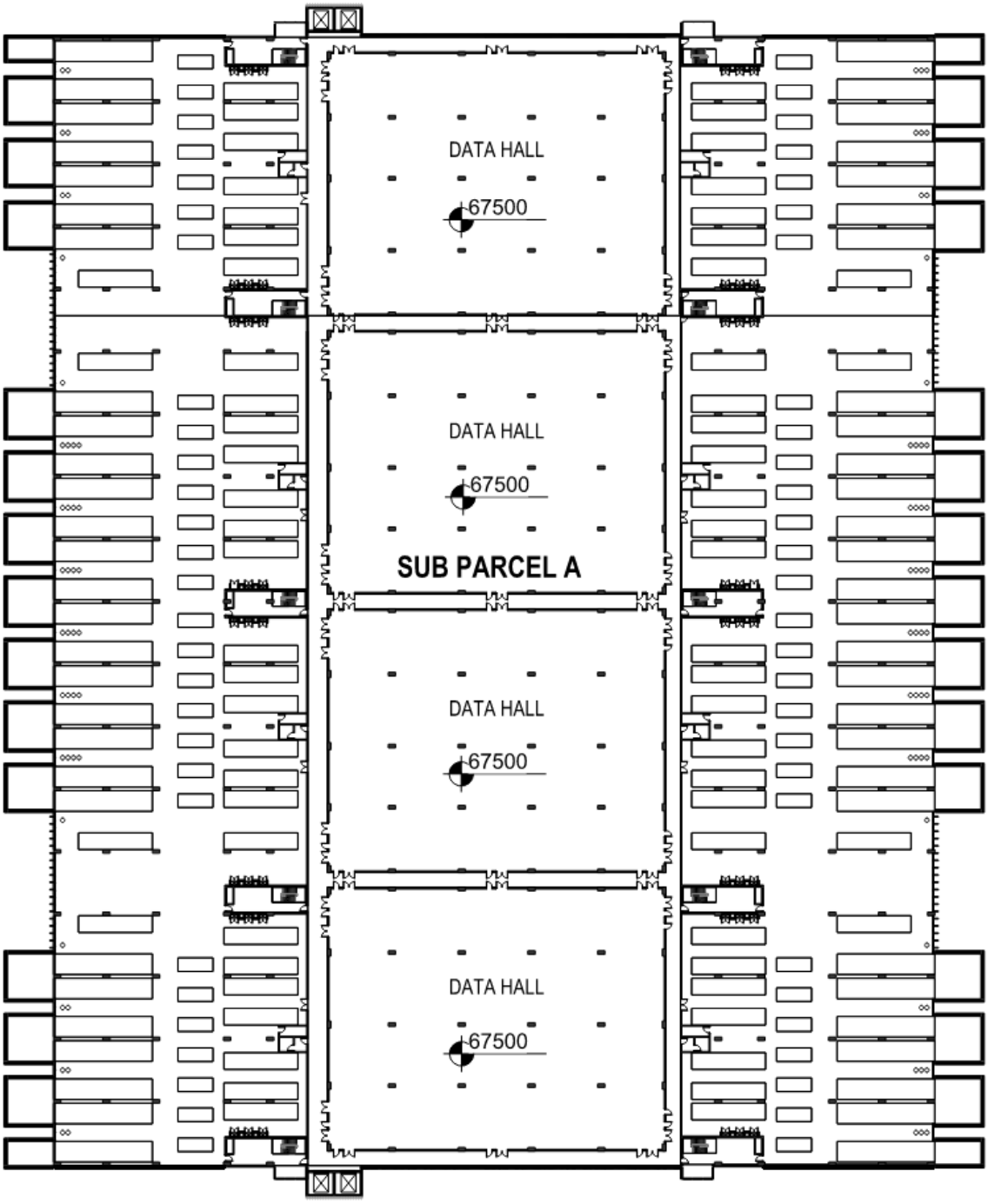


Figure 3-8: Level 2 Layout of Data Hall Building – Typical per Sub Parcel

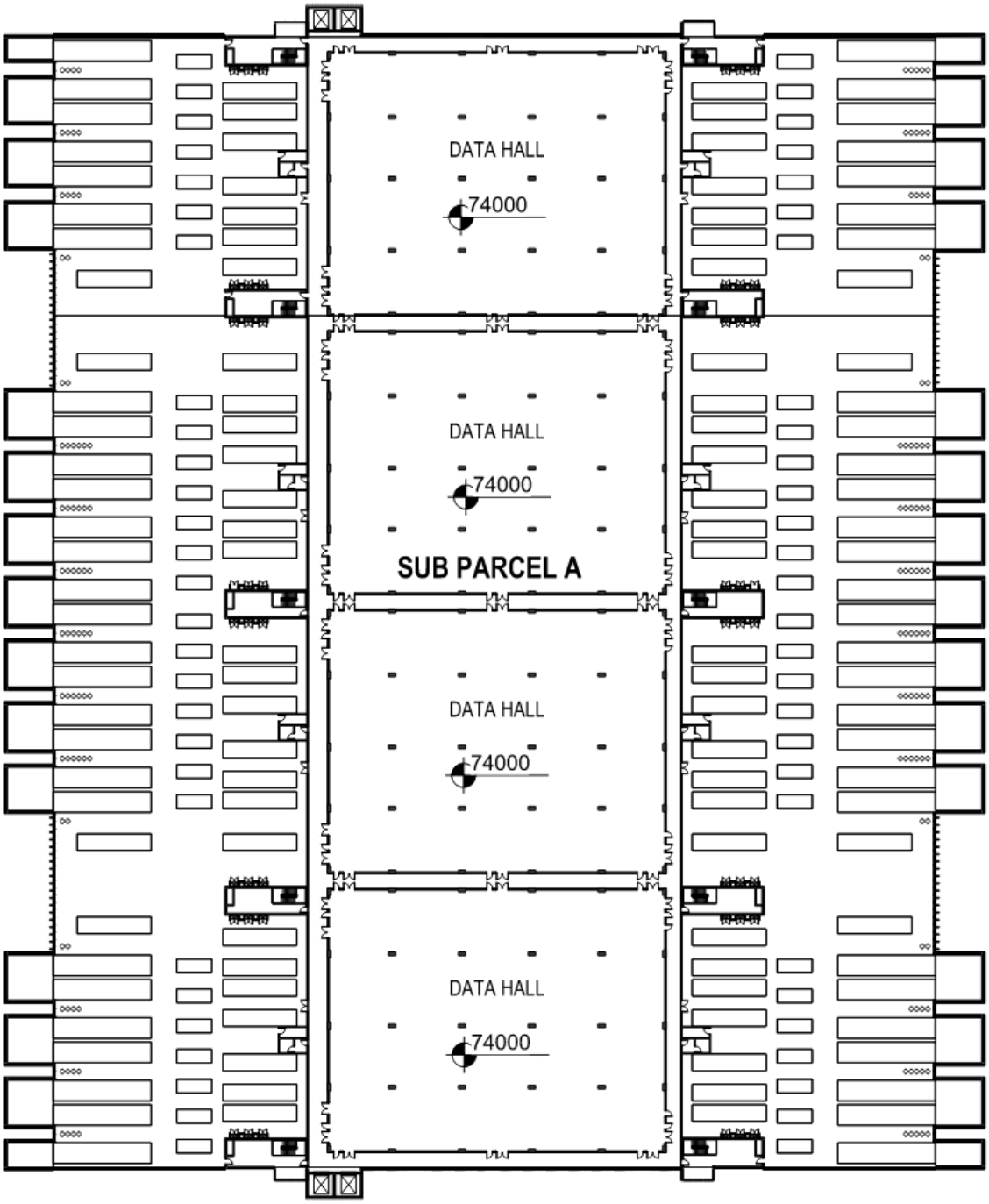


Figure 3-9: Level 3 Layout of Data Hall Building – Typical per Sub Parcel

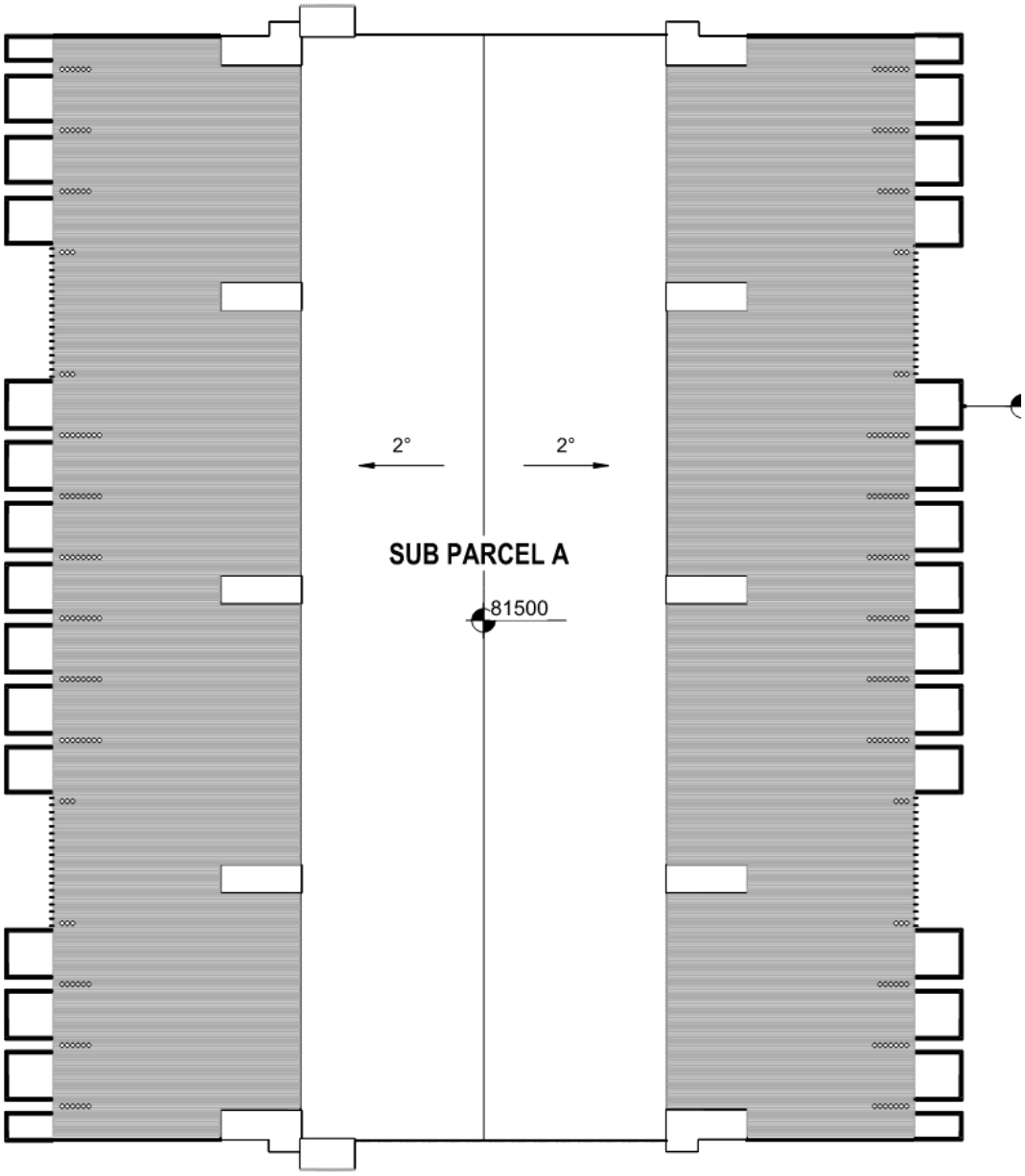


Figure 3-10: Level 4 Layout of Data Hall Building – Typical per Sub Parcel

3.3 Site Phasing

The site is proposed to be constructed in four (4) stages phases as per the below figure.

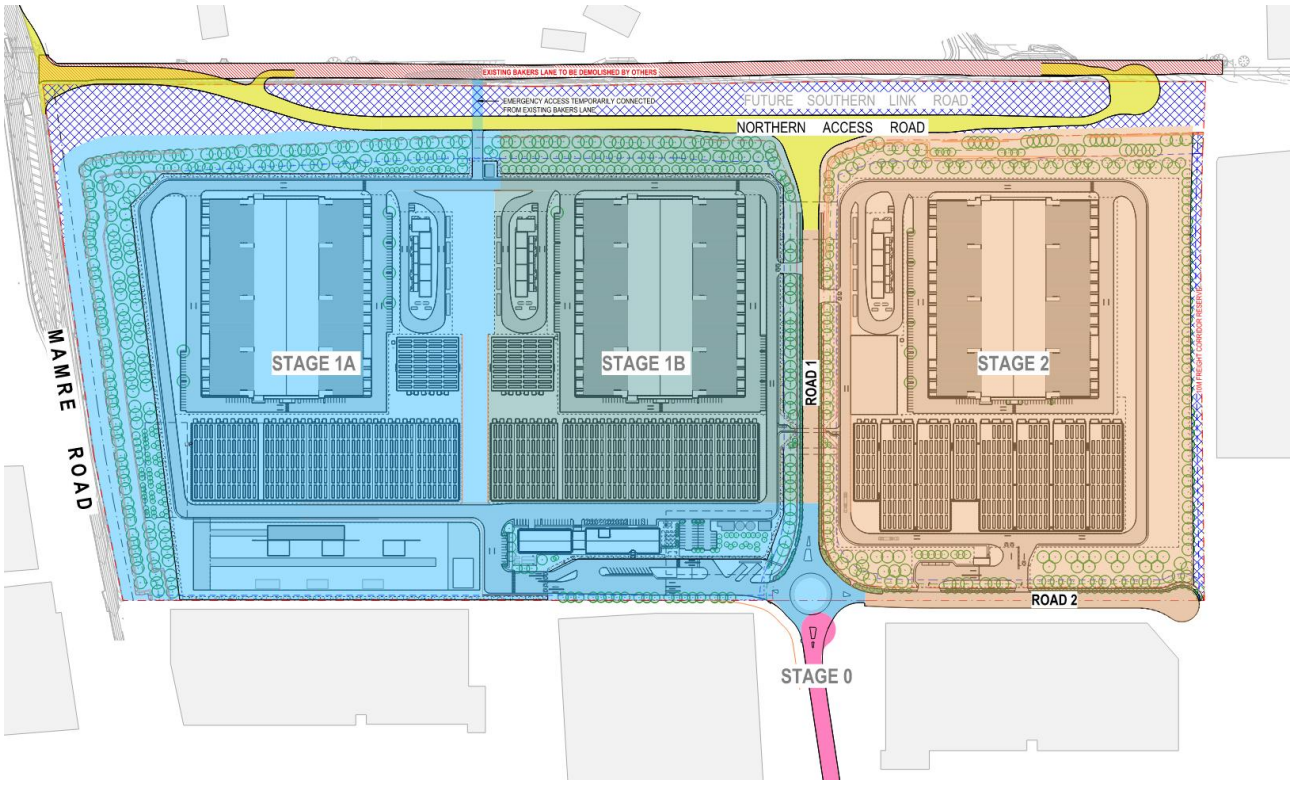


Figure 3-11: Site Staging plan

3.4 Sensitive Receivers

The Site is located within the suburb of Kemps Creek in the Penrith LGA and forms part of the MRP. The MRP was subject to a rezoning in mid-2020 and provides 850 hectares of industrial land and 95 hectares of environmental conservation areas. The purpose of the MRP is to promote economic development and employment through the delivery of major industrial facilities. The site is currently vacant, with eleven (11) dams and small patches of vegetation. Much of the site is classified as urban-capable certified land, with only a small portion at the northeast of site identified as containing biodiversity values. The site is zoned IN1 General Industrial pursuant to State Environmental Planning Policy (Industry and Employment) 2021 (Industry and Employment SEPP) and a small portion of the site adjoining Mamre Road is zoned as SP2 Infrastructure for future acquisition and upgrades of Mamre Road.

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.

Notable existing land uses in the vicinity include warehouses and factories located to the west and south of the site. To the east, the area comprises undeveloped land as well as additional warehouse and industrial facilities, including the Amazon Fulfilment Centre, Costco Distribution Centre, and Direct Freight Express.

To the north, across Bakers Lane, are Mamre Anglican School, Trinity Catholic Primary School, and Emmaus Catholic College, situated approximately 50 m to 400 m from the site. These are considered the nearest sensitive receivers.

Other sensitive receivers located further from the site include a temple approximately 2 km to the southeast, a golf club and surrounding residential area approximately 2.4 km to the southwest, and several childcare centres and schools within a residential area approximately 2.6 km to the north.

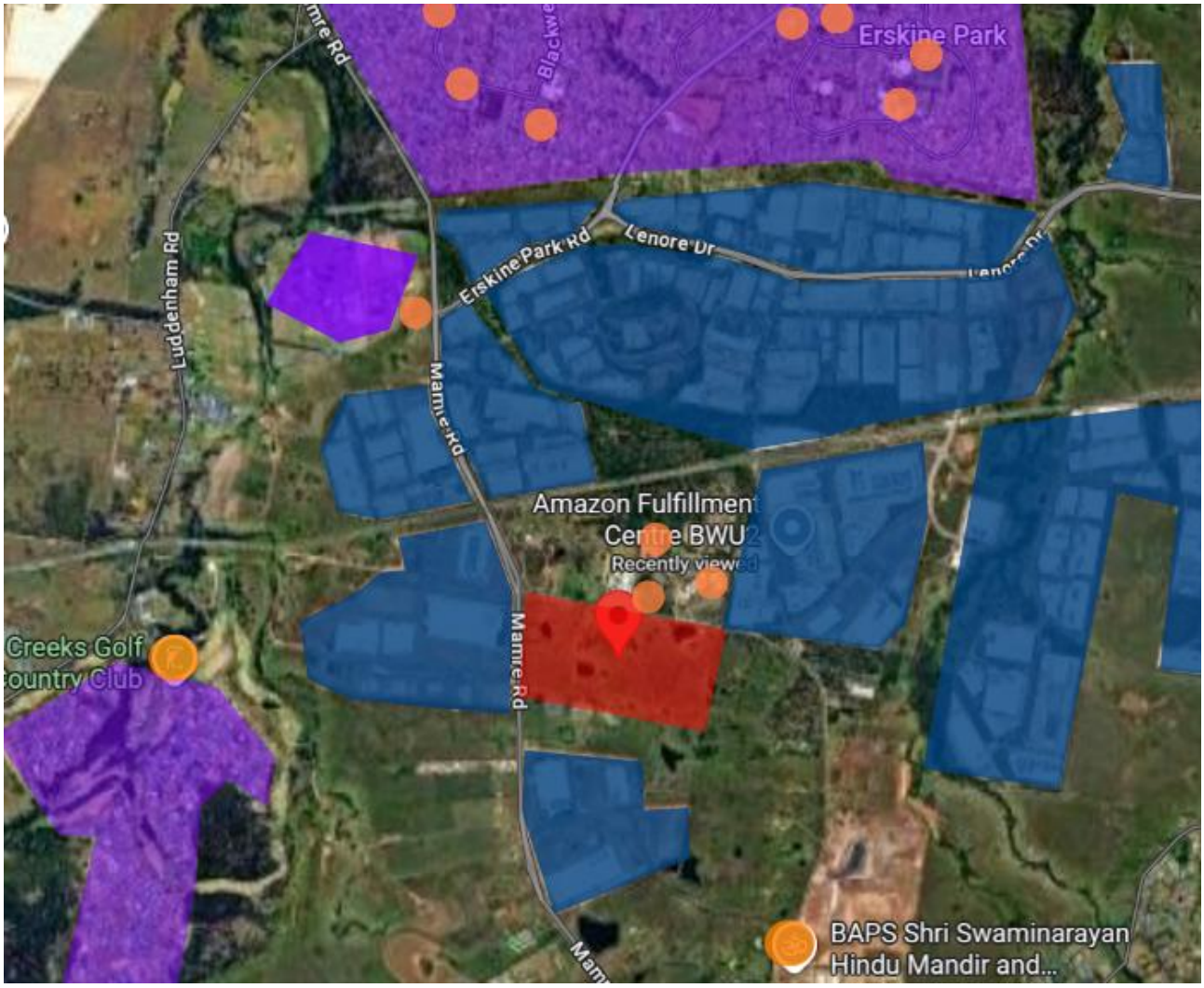


Figure 3-12: Building around the site (Red: the site, Blue: Class 7& 8 buildings, Orange: Class 9 buildings, Purple: Residential buildings)

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 Per Sub-Parcel	Mass Or Volume Per Item	Mass Or Volume Per Sub-Parcel	Total Mass or Volume for the Site
Diesel				
Diesel Generators and Day tanks	280	1,000 L	280,000 L	15,842,000 L*
Bulk Diesel storage tanks – 70 m^3	44	70,000 L	3,080,000 L	
Bulk Diesel storage tanks – 80 m^3	24	80,000 L	1,920,000 L	
Lithium-Ion Batteries				
Power Train Unit (PTU) located in data hall building (Containing Li-Ion Batteries)	192	2,856 kg	548,352 kg	1,717,027.2 kg
Power Train Unit (PTU) located in chiller gantry (Containing Li-Ion Batteries)	84	285.6 kg	23,990.4 kg	
'In-rack UPS' (in data halls server racks)	N/A[1]	N/A[1]	N/A[1]	

*Also includes additional 2 x 1,000 L day tanks within the COSH building (2,000 L in total).

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

Equipment	Quantity Per Sub-Parcel	Mass Or Volume Per Item	Mass Or Volume of Per Sub-Parcel	Total Mass or Volume for the Site
Transformer Oil in High Voltage Substations (HVSS)				
Located in outdoor sub-parcel substations	4	40,000 kg	160,000 kg	1,080,000 kg
Located in outdoor campus substations	3[4]	200,000 kg	600,000 kg	

Table 4-3: UN Classification Summary

Class	Un Packing Group	Description	Quantity
C1[2]	N/A[2]	Diesel Fuel[2]	15,842,000 L
9	N/A	Lithium Ion Battery	1,717,027.2 kg

Class	Un Packing Group	Description	Quantity
C2[3]	N/A[3]	Mineral Oil	1,080,000 kg

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 have 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. 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.

Note4: There are three (3) network substation transformers on the site, they do not serve buildings/ sub parcels individually.

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 internal bulk storage tanks. 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 on the Ground Floor in tank rooms one serving each shell with 5 tanks per room (refer Figure 4-1). Noting that layout shown is indicative, and is understood that 5 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. They are located within each of the generator enclosures from Ground floor to Level 4 with 34 units per shell, noting that each level has minor changes to the layout of generators (Figure 4-3).

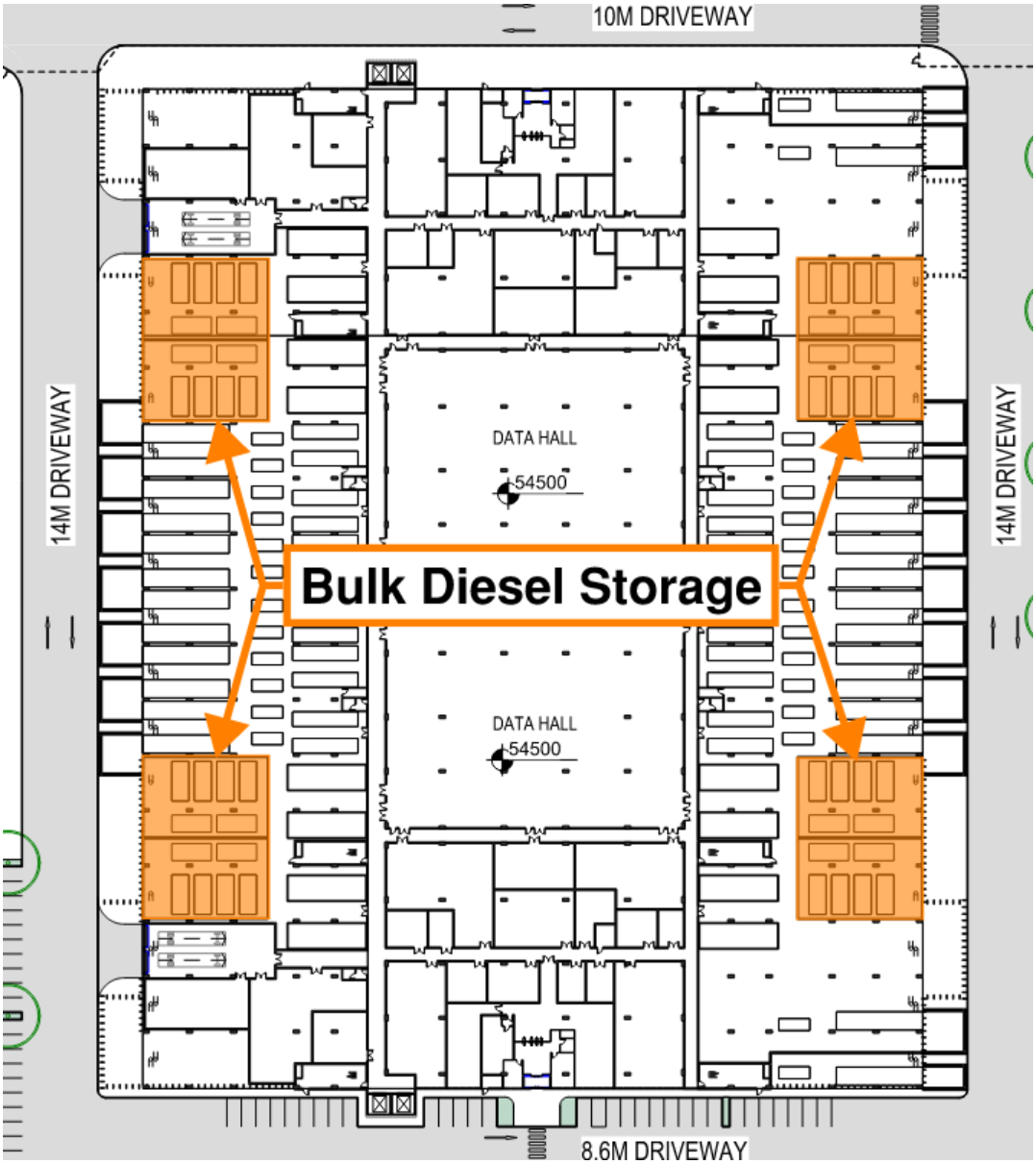


Figure 4-1: Location of Bulk Storage tanks – Ground Floor Data Hall Building – Typical Layout of All Buildings

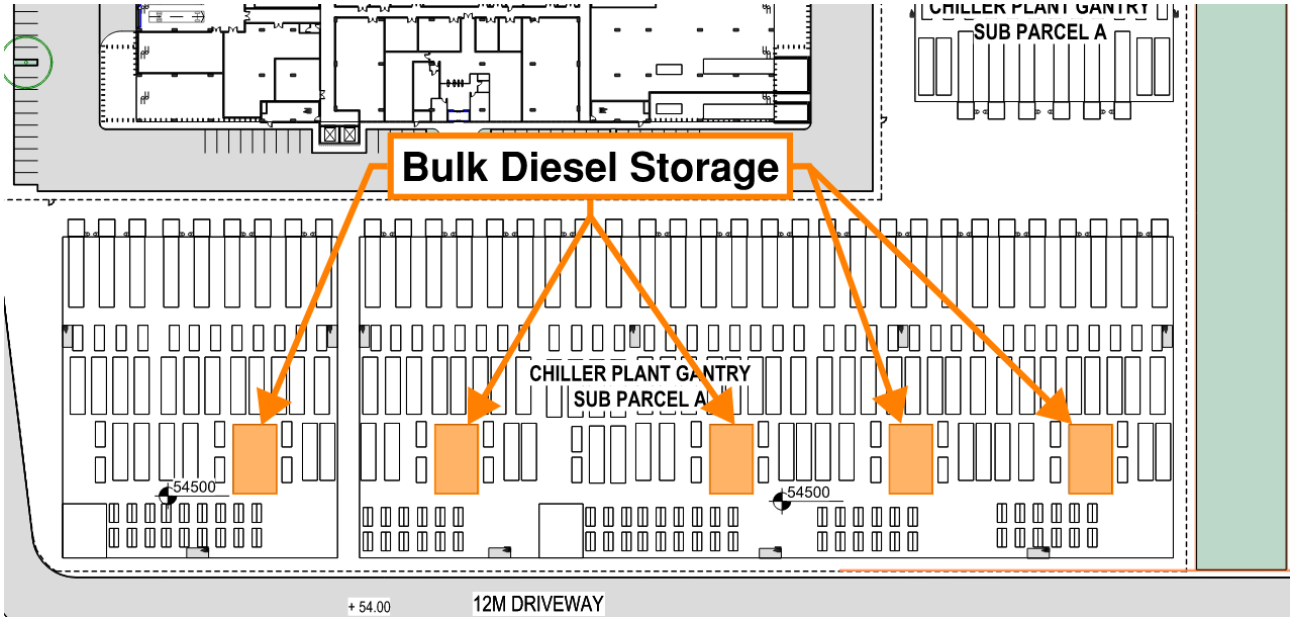


Figure 4-2 Location of Bulk Storage tanks – Ground Floor Chiller Gantry – Typical Layout of All Buildings

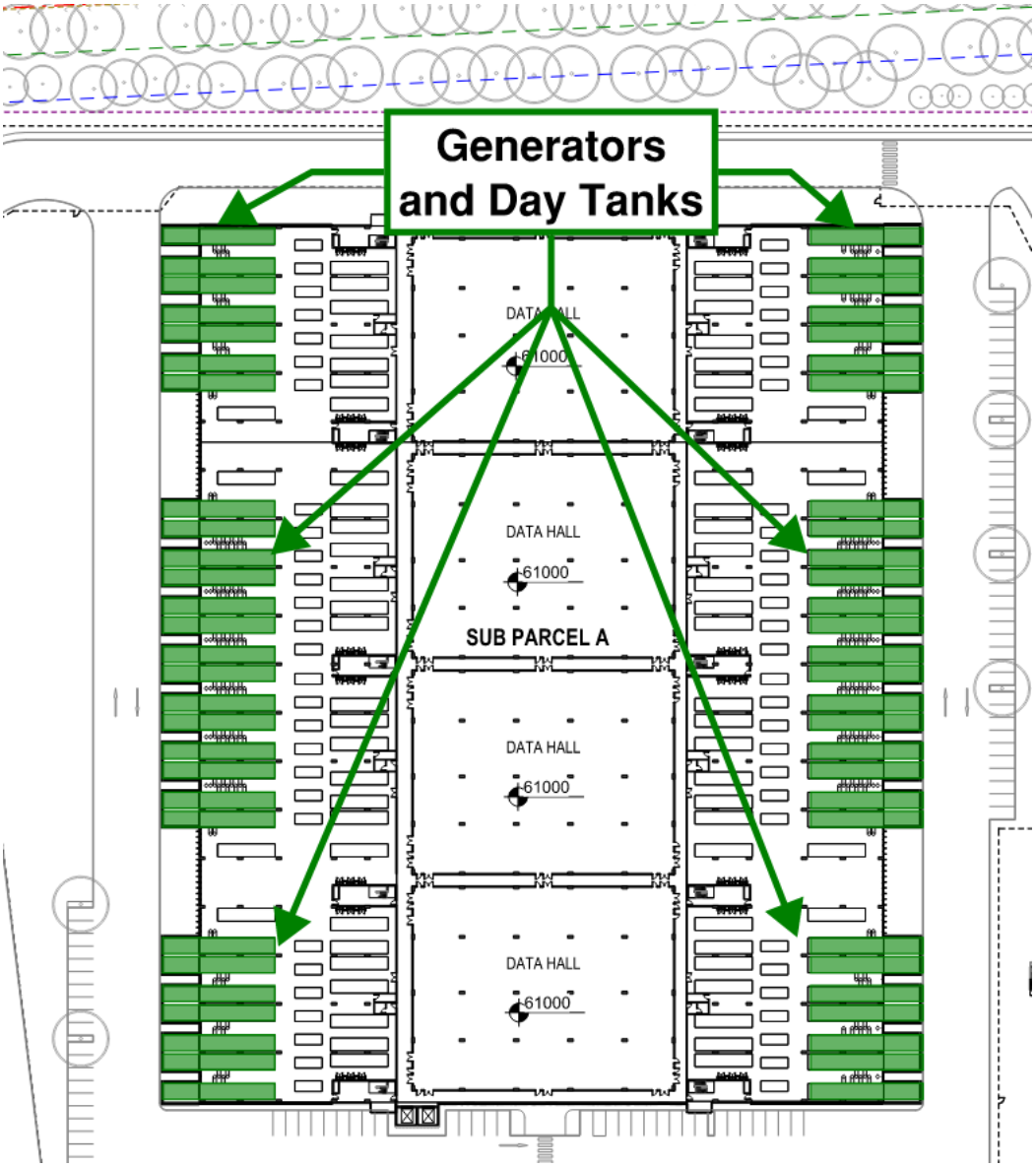


Figure 4-3: Location of Generators and Day Tanks (Level 2)

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	70,000 L	132	9,240,000 L
	80,000 L	72	5,760,000 L
Day tanks	1,000 L	842	842,000 L

4.3 Lithium-Ion batteries

Data centres have multiple standard deployments for the battery backup systems, the most common being either PTU systems in dedicated battery rooms, 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 PSU systems within dedicated separate rooms. As such the total quantity of batteries present onsite is expected to be consistent regardless of the final configuration. It has been confirmed by the electrical designer that each of the designed battery cabinets in the proposed PTU can discharge maximum 231kW individually, however each bank of 10 within a PTU would only need to discharge ~2000kW.

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 PSU configuration is shown below in Figure 4-4.

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

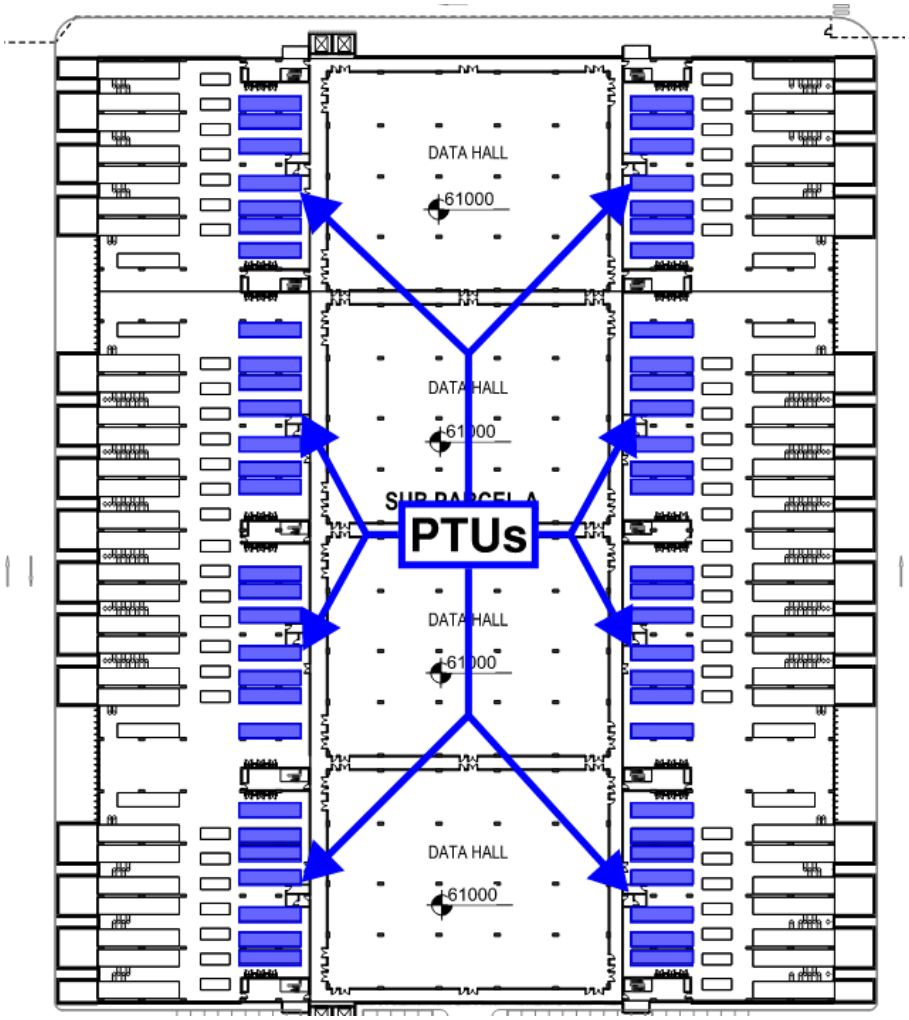


Figure 4-4: PSU Locations (typical layout per Level)

4.4 Transformer Oil (HVSS)

The substations are 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 analysed 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* [12].

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). 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.

Building Specific Substation Transformers

Transformers are proposed to be located in substation yards north of each building as depicted below in Figure 4-5. For Sub-Parcels A, B, C (each containing four shells), four 140 MVA transformers are proposed.

Each 140 MVA transformers contains 40 t of oil. Noting that transformers models have not been confirmed in this concept design, these values are based of reference transformers, as such these values are approximate, exact detail will be advised in the subsequent design phase.

Campus Substation Transformers

Additional to the above, a network substation is located on the south-west of the site, the substation contains three (3) power transformers located in the approximate are shown in Figure 4-5 below. The transformers are likely to be Ester Oil (K-type) although as the design is still in the early stages for conservatism they have been assumed to contain mineral oil, as discussed previously.

There is proposed to be three (3) 500/132kV 625MVA transformers, each transformer is estimated to contain 200kL of oil. Noting that transformers models have not been confirmed in this concept design, these values are based of reference transformers, as such these values are approximate, exact detail will be advised in the subsequent design phase.

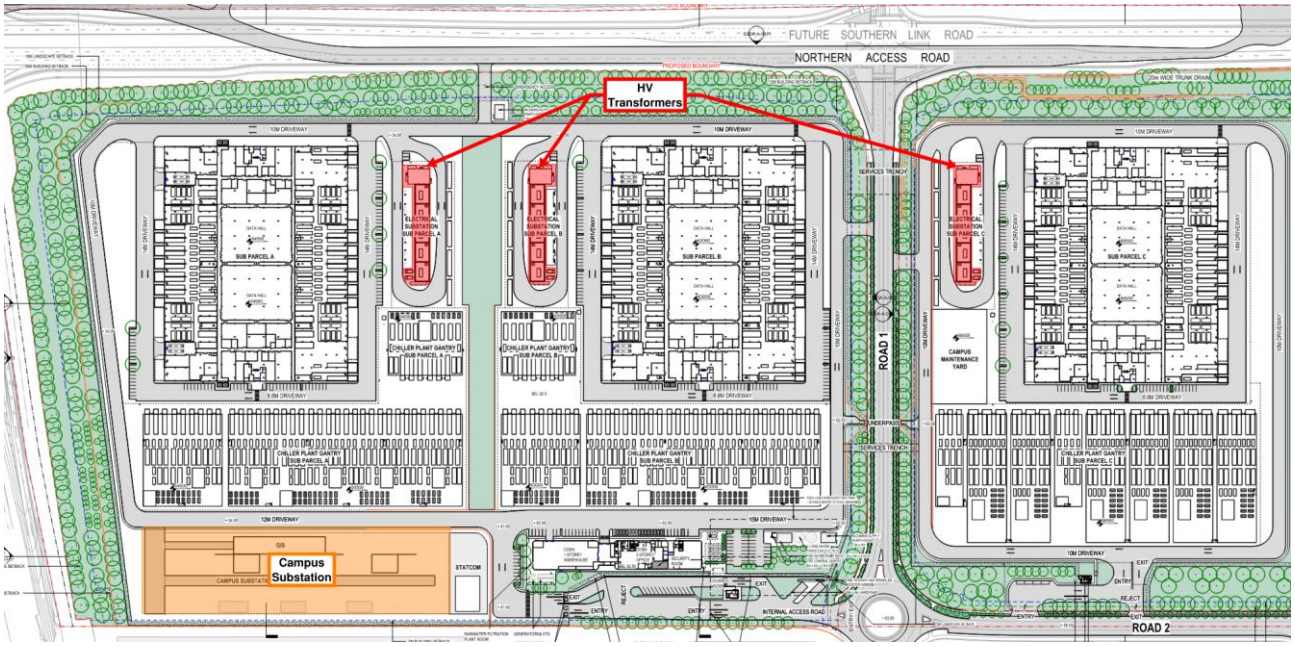


Figure 4-5: HV Transformers Locations

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	Mass Per Transformer	# Transformers	Total Volume
Sub-parcel Substation Transformers			
140 MVA	40,000 kg	12	480,000 kg
Campus Substation Transformers			
625 MVA	200,000 kg	3	600,000 kg
Total Site Capacity			**1,080,000 kg**

4.5 Alternative Locations for Identified Hazards

The proposed locations on site for the backup generators, their associated diesel fuel storage and the lithium-ion batteries forming part of the UPS system, has been developed by the stakeholder team to suit both the operational needs of the site and to result in the optimum safety profile for the site. A discussion on the locations and any alternative option is presented in the below table. Note, any specific controls discussed are presented in greater detail in subsequent sections of this report.

Table 4-6: Alternative location for identified hazards

Hazard	Current Location	Typical Alternative Location
Backup generators	Backup generators are current located within the generator gantries associated with each data centre building onsite and on the ground floor of the chiller plant area. This is principally within the centre of the site, i.e. as far away from the property boundary is feasible. Structure supporting the generators is 4-hour concrete.	As the generators require substantial airflow to correctly function (intake and cooling air, and exhaust), locating them completely inside of the building floor plate is not feasible without still providing ducted supply/exhaust air to the units. Other alternative locations such as completely on-grade would result in generators being location directly adjacent to the property boundary due to large spatial requirements to support all the generators on the same level.
Bulk Diesel Storage	The bulk diesel storage is proposed to be within each data centre building and the chiller gantry on ground floor, contained within a fire rated tank chamber (‘room’) complying with AS1940:2017. This is considered to be the optimal location on site with respect to adjacent sensitive receivers.	Alternative bulk fuel locations such as external bulk fuel tanks (i.e a tank farm), place the tanks closer to the site boundary and without the protection of a fire rated room or an automatic sprinkler system. Whilst in-ground tanks (‘buried’) tanks also an alternative option, this would result in major site excavation during installation and hence soil movements during construction and any associated future maintenance or repair.
Lithium-ion batteries	The proposed LIBs onsite are located either within fire rated PTU enclosures on the gantries of the data centre buildings or within the data halls. In both locations the batteries are fire separated from both other battery installations and alternative hazards.	Alternative location for the LIB systems onsite are outside of the building footprint in an external BESS ‘farm’ setup. This on-grade deployment would result in battery units being location directly adjacent to the property boundary due to large spatial requirements to support all the PTUS on the same level.

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) (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 [10].

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

Dangerous Good	Maximum Quantity On Site	Threshold Quantity Trigger
Diesel Fuel	15,842,000 L	100,000 L
Lithium-Ion Batteries	1,717,027.2 kg	10,000 kg
Transformer Oil	1,080,000 kg	N/A

Note: As proposed transformer oil is not considered a DG 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 [11]

Dangerous Good	Maximum Quantity on Site	Threshold Quantity Trigger	Placarding Quantity Trigger	Manifest Quantity Trigger
Diesel Fuel	15,842,000 L	1,000 L	N/A[1]	N/A[1]
Lithium-Ion Batteries	1,717,027.2 kg	100 kg	N/A[1]	N/A[1]
Transformer Oil	1,080,000 kg	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 [11]

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

Section #	Item	Requirements*
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 conduction 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 conduction 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. Additional 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 is reasonably practical, containers, pipe work, and associated attachments are protected against damage cause 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 provide maintained and accessible
Subdivision 4 363-	Storage and handling	A person conducting business must ensure that equipment used to 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 [11] 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.

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.

5.3 Bushfire

As per the Blackash report (dated 10/09/2025) the site is designated as Category 3 classified vegetation (grasslands) with a small area of Category 1 classified vegetation (forest) and as such must comply with the NSW Rural Fire Service document Planning for Bushfire Protection 2019. This compliance shall be outlined within the Blackash report noting that specific bush fire protection measures are expected to be determined in subsequent design phases.

5.4 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.

Through the SEPP 33 assessment it is identified that the site does not require a PHA to be developed for the site. Noting that it is expected that a Fire Safety Study will be required for the site as a condition of consent. Additionally, it is noted that additional requirements derived from Protection of the Environment Operations Act 1997 No 156 due to the storage of dangerous goods is considered outside of the scope of a SEPP33 assessment. Regardless, it expected to be applicable given the site exceeds the relevant thresholds under the Act.

6. Consideration of Relevant Standards and Datasheets Required by the SEARs

Further to the PRS, as required by the project specific 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.

A high-level summary of the proposed controls is included in Section 6.1 and a discussion of each Standard required by the project specific SEARs is included in Section 6.2

6.1 Recommended Controls

Through collaboration with the stakeholder team the following initial prevention and migration control measures have been developed to implemented to the site. Note, these measures shall be further refined during the subsequent design development stages.

6.1.1 Diesel Storage

To mitigate the risk associated with the storage of diesel on the site prescriptive compliance with the relevant aspects of AS1940:2017 shall be achieved.

6.1.2 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 6-1: Lithium Batteries controls

Item	Measure/Input
Batteries	
Storage	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.

Battery Compliance	• 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:
	  ○ Battery Rooms – No more than 100kWh per rack.
	  ○ Data halls – No more than 20kWh per rack, no more than 2 shelves per rack.

Battery Management System (BMS)	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.

Item	Measure/Input

In-rack battery configuration	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:
	• 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:
	  ○ 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.

Fire Separation requirements	Fire separation requirements shall be as follows: • Battery Rooms – Minimum 4-hour fire compartments which aligns with NCC requirements • Data halls – Minimum 2-hour fire separation of the floor from the wider floor plate. Note, horizontal separating elements and structure shall be 4 hours to comply with the prescriptive requirements of NCC Spec 5 for a Class 7b.

Ventilation	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:
	• Battery rooms ventilation in accordance with FM Global data sheet 5-33 [3]:
	  ○ 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 $m^3/min/m^2$ (typically 750l/s depending on the room size) to ensure LEL for relevant off gases are not exceeded.
	• Data hall ventilation:
	  ○ 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:
	  ○ 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

Item	Measure/Input
	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.
New Battery Storage Rooms	• 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.
Spent Battery Storage Rooms	• 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.
Off gas detection	• 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.
Detection	• Dedicated smoke detection in the form of MASD shall be provided both within the data halls and within the battery rooms.
Fire Hydrants	• AS2419.1:2021 system with capacity for up to 3 hydrants (30 L/s) operating.
Sprinkler Performance	• 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 - 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 many impact the required duration). ○ Data halls – 8mm/min over 330 m^2 and 60 min duration in accordance with FM global data sheet 5-32 [2]. (Chemistries other than LFP may impact required duration).
Contaminated water retention	• 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 210 kL (totalling 630 kL) retainment tank per two (2) data centre buildings, i.e three (3) in total for the site. Appropriate drainage shall be provided to other areas to facilitate this. The tank capacity has been determined based on the prescriptive requirements for the full sprinkler design density and area 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

Item	Measure/Input
	runoff water for contaminants. Note, that removal and treatment of any contaminated water is outside of brigade's remit.
Management Procedures	
Inspection and Maintenance	All Essential Fire Safety Measures shall be maintained in accordance with the requirements of AS1851:2012.
Management In Use Plan	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: • 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.
Post fire protocols	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: • Moving fire affected batteries to external areas post fire event. • Firewatch for 48 hours.

6.1.3 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 6-2: HVSS Oil Controls

Item	Design
High Voltage Substation	• Substation compliant with the requirement of AS3000:2018 and AS2067:2008. • Oil type – Mineral oil (Flash point approximately 140°C) or another oil type with a higher flash point. • Bund shall be provided to each transformer with capacity of 110% for the total volume of oil within the subject transformer, additionally: ○ 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.

6.1.4 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 data centre building in accordance with NCC C3D5 (2), despite the building not being considered a Large Isolated Building.

Bushfire Protection as per the Blackash report shall be followed throughout the site. Due to this bushfire is considered to be controlled and as such shall not be considered as initiating events in the below revised Risk Assessment.

6.2 Consideration of the SEARs Requirements

6.2.1 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 6.1, 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 and the performance of the automatic sprinkler system. It shall be noted that where batteries are proposed in densities or configurations beyond the scope of this standard (i.e. in PTUs or other 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.

6.2.2 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 6-3: 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 design that an automatic sprinkler system and CO2 extinguishers shall be used as additional fire protection measures for the Li-ion batteries.

6.2.3 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 6.1.

6.2.4 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 implement the relevant requirements outlined in this standard for the bulk diesel and fuel day storage tanks.

7. Recommendations and Conclusion

A review of the proposed hazardous goods stored within the proposed data centre located at 706-752 Mamre Road, Kemps Creek NSW 2178 was conducted against the requirements of Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) and Work Health and Safey 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 Safey 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

Further to the above, as required by the SEARs, the assessment demonstrated consideration and relevant implementation 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 undertaking during the project development. In addition, requirements from Protection of the Environment Operations Act 1997 No 156 are expected to be applicable given the site exceeds the relevant thresholds under the Act.

8. 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
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
FSS	Fire Safety Strategy
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
PRS	Preliminary Risk Screening
PTU	Power Train Unit
PHA	Preliminary Hazard Analysis
RSET	Required Safe Egress Time
RTI	Response Time Index
SBU	Short Break Unit

STATCOM	Static Synchronous Compensator
SEPP	State Environmental Planning Policy
WHSR	Work Health and Safety Regulation 2025

9. 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 brochre, 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. Safe Work Australia, Guild for Major Hazard Facilities – Safety Assessment, Mach 2012
10. 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
11. Work Health and Safety Regulation 2017, under the Work Health and Safety Act 2011, dated 11 August 2017
12. 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

Jemena

ASSETS AFFECTED

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

Please note that there are **Gas Mains or Services** in the vicinity of your intended work, as generally illustrated on the attached map. There may also be other mains or services at the location. For an explanation of the map, please see the legend attachment 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.

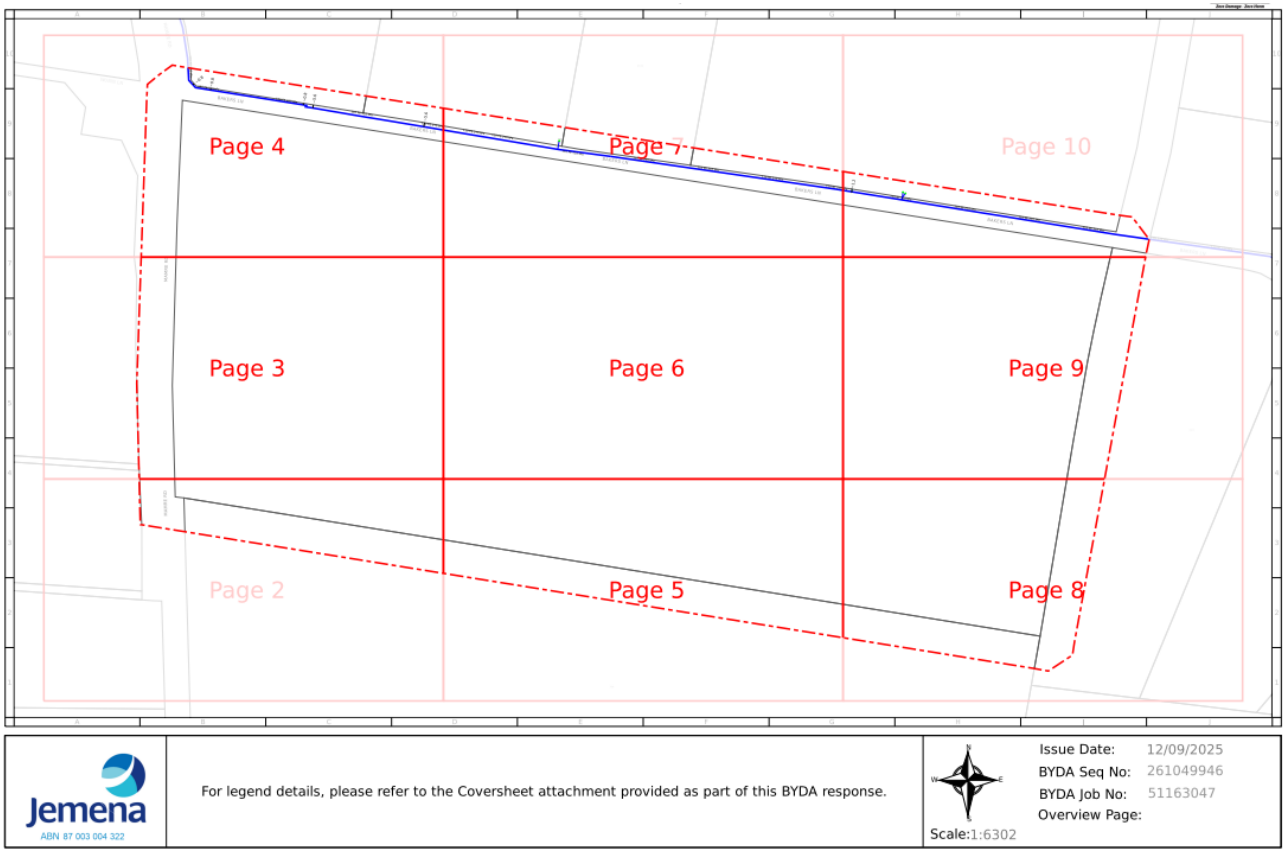
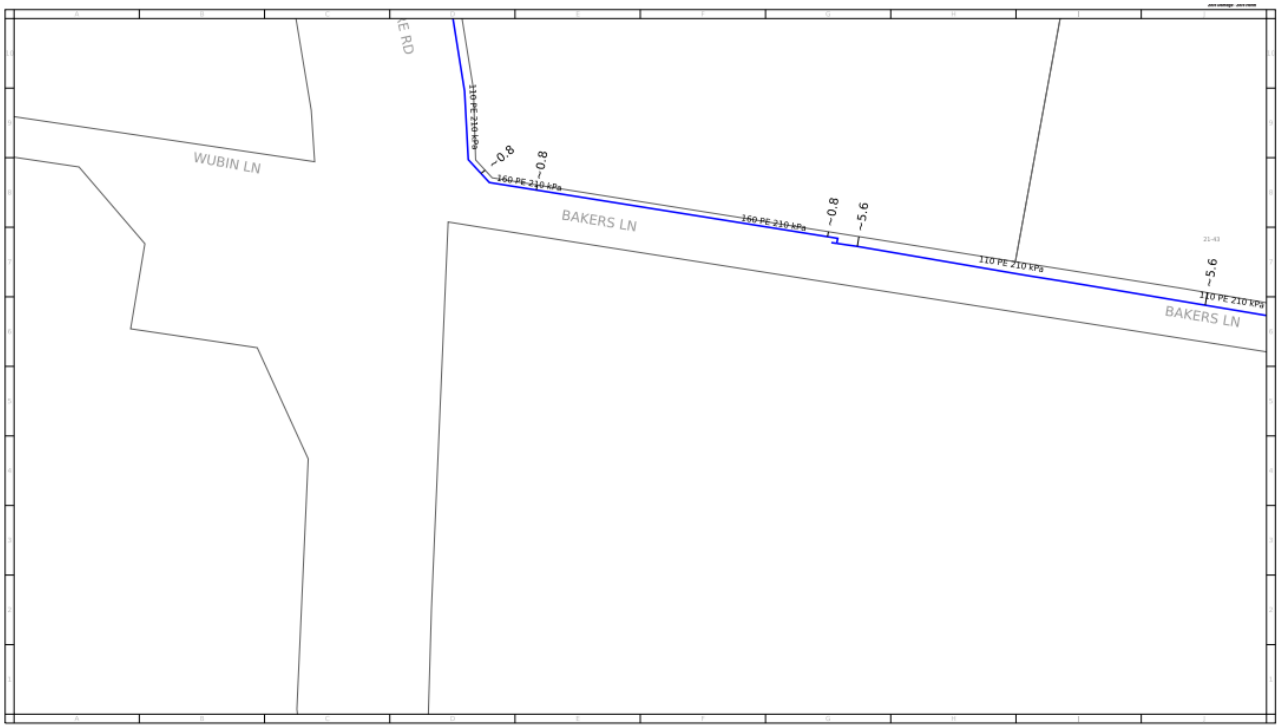


Figure A-1 Dial Before You Dig enquiry results regarding gas infrastructure – 12/09/25



Jemena ABN 87 003 004 322

For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.

Issue Date: 12/09/2025
BYDA Seq No: 261049946
BYDA Job No: 51163047
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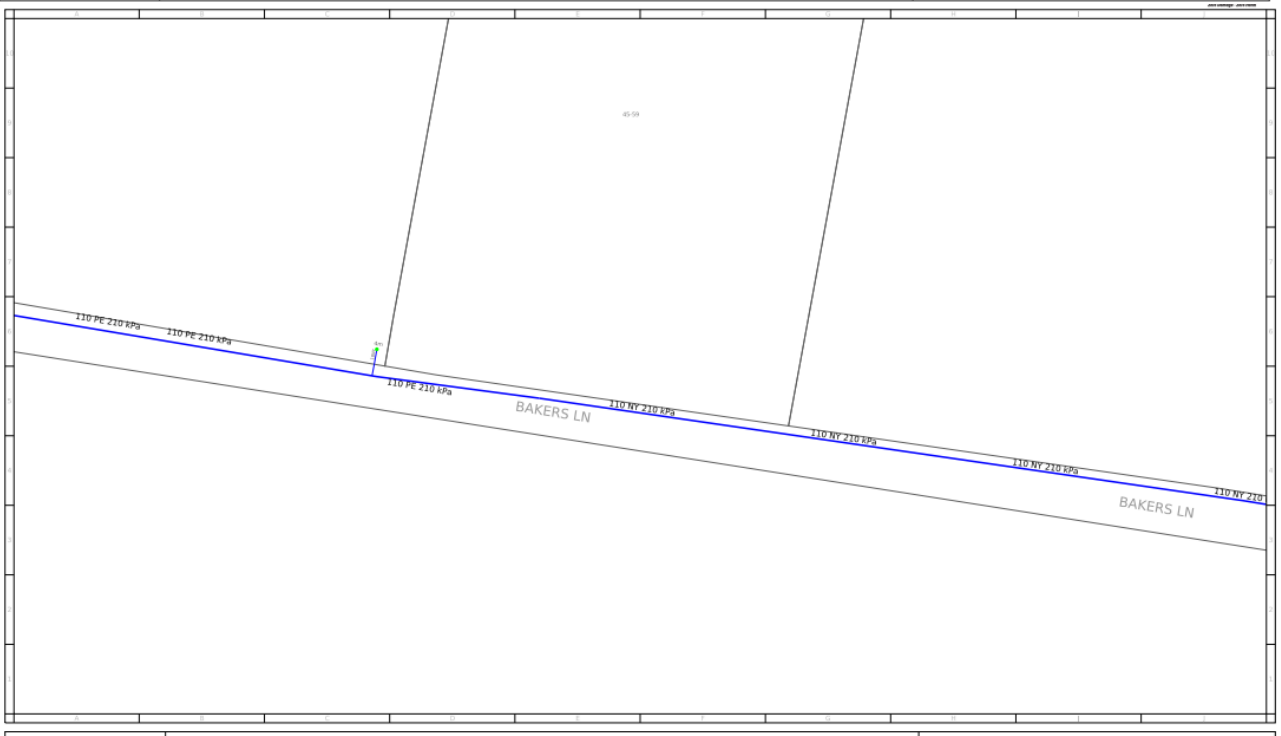

Jemena ABN 87 003 004 322

For legend details, please refer to the Coversheet attachment provided as part of this BYDA response.

Issue Date: 12/09/2025
BYDA Seq No: 261049946
BYDA Job No: 51163047
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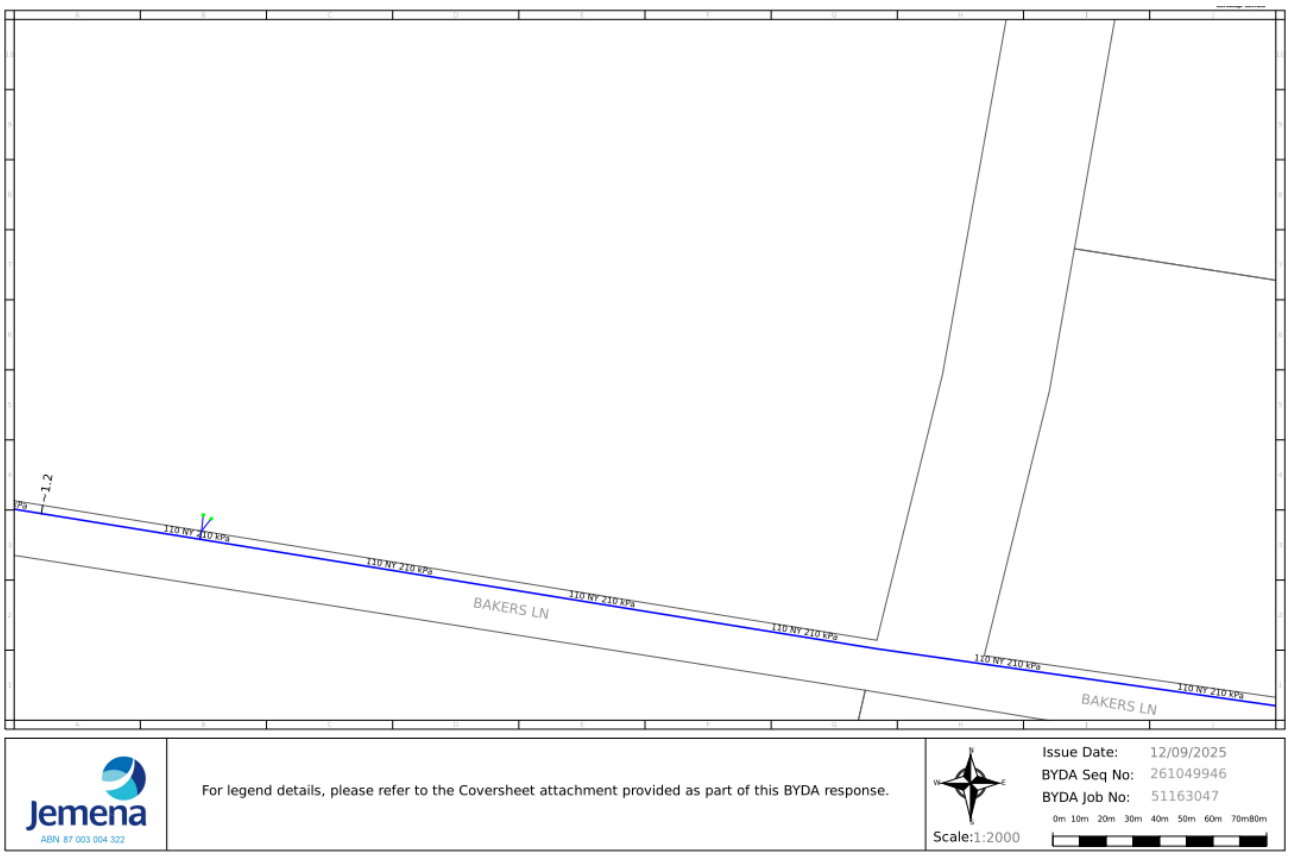


Figure A-2: Dial Before You Dig enquiry results close ups of gas line – 12/09/25

Appendix B Aurecon Confirmation of Quantities

	Sub Parcel A
	Nominal Fuel Storage Capacity (kL)
Shell A	744
Shell B	894
Shell C	894
Shell D	744
ACC Gantry	2004
Total	5280

	Sub Parcel B
	Nominal Fuel Storage Capacity (kL)
Shell A	744
Shell B	894
Shell C	894
Shell D	744
ACC Gantry	2004
Total	5280

	Sub Parcel C
	Nominal Fuel Storage Capacity (kL)
Shell A	744
Shell B	894
Shell C	894
Shell D	744
ACC Gantry	2004
Total	5280

	Nominal Fuel Stotage Capacity (kL)
COSH	2

Total Fuel Volume	15842	kL
Total Fuel Mass	13466	tonnes

Assumes a diesel specific gravity of 0.85

PTU			
	Qty Cabinet	Battery (kg)	Total (kg)
24	10	2856	68544
56	10	2856	159936
56	10	2856	159936
56	10	2856	159936
84	1	285.6	23990.4
1 Sub parcel			572342.4
3 Sub parcel			**1717027**

Subparcel A	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	**160**

Subparcel B	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	**160**

Subparcel C	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	**160**

Total oil mass	480	Tonnes

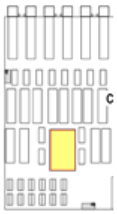
Figure B-1: Dangerous Goods Quantities Provided by Aurecon (12/06/2026)

- number and volume of bulk storage tanks

70 m^3 Bulk Tanks on site	132
80 m^3 Bulk Tanks on site	72
Day tanks on site	842

- location of bulk storage tanks within the chiller gantry

On ground floor of the chiller gantry



- the number of generators located within the data hall building and gantries

	Sub Parcel A	Sub Parcel B	Sub Parcel C
	Generator	Generator	Generator
Tech Space	4	4	4
Level 0	24	24	24
Level 1	56	56	56
Level 2	56	56	56
Level 3	56	56	56
ACC Gantry	84	84	84

	Generator
COSH	2

For the batteries are there any PTU's located within the chiller gantry?

Yes, there are 84 PTUs in the chiller gantry in each subpacel.

Additionally, could the volume of high voltage transformer oil be confirmed for both the sub parcel substations and the campus substation.

Sub-parcel TX oil volume:

Subparcel A	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	160

Subparcel B	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	160

Subparcel C	Mass of Oil (ton)
TX1	40
TX2	40
TX3	40
TX4	40
Total	160

Total oil mass	480	Tonnes

Figure B-2: Dangerous Goods Quantities Provided by Aurecon (11/06/2026)

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