Our Ref: 18AWE02.5:NvD/JT
DoP ref: SSD 9741
NSW RFS ref: D18/8341

4 February 2020

A W Edwards Pty Ltd
Level 1, 131 Sailors Bay Road
NORTHBRIDGE NSW 2063

Attention: Mr D DiPaolo

Dear Dino

Re: Lane Cove Data Centre – summary of changes for resubmission / Addendum Bushfire Protection Assessment
1 Sirius Road, Lane Cove West

Travers bushfire & ecology (TBE) has been requested to provide a revised bushfire assessment to address the latest amendments to the Lane Cove Data Centre scheme.

By way of background *Travers bushfire & ecology* prepared the original bushfire protection assessment for the construction of a data center in February 2019, followed by an addendum report in August 2019 and a response to the NSW RFS request for additional information (regarding generator and diesel fuel tank locations) in October 2019.

The NSW RFS issued their recommended conditions of consent which were incorporated into the development consent (SSD-9741) on 15/11/2019 as outlined in Table 2 of this report.

This report has been prepared in support of the proposed modifications to the State Significant Development (SSD) approval. These changes are a product of a change in essential infrastructure equipment associated with the project. The original proposed scheme included medium voltage (MV) emergency generators which provide backup power supplies to the site in the event of a major disruption to the mains supply. The proposed modifications replace the MV generators with low voltage (LV) generators. The direct outcome of this replacement is an increase in the number of generators required to effectively power the entire site. In addition to the increase in generator numbers and associated flow on effects, the revised drawings include other modifications to the original scheme.

In summary, the proposed changes include;

- Previous building phases A, B and C, have been rationalised into two (2) phases; buildings A and B.

- The diesel fuel storage originally located externally as approved under SSD-9741; has been located within the building on level 1. These consist of sixteen (16) individual steel tanks located on the northern side of level 1. The diesel store will be bunded to contain any potential fuel leaks or spills. Based on the new location, steel tanks will revert to single walled with leak detection provided to the room itself. The room will be 4-hour fire rated.

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- The bushfire / water tank on the roof level will be increased in capacity to approx. 150,000 litres. This doubles as a water supply for internal sprinklers in the event that mains supply to the sprinkler system fails.

- External plant platforms revised to suit the increase in generator numbers. The increase has necessitated additional levels to the external plant and equipment platforms. Increase from two (2) to four (4) levels on the west; five (5) levels to the north; and six (6) levels to the east. The footprint area has increased slightly to accommodate the required numbers. Overall height of the plant platforms aligned with existing parapet levels on the building. Overall numbers of generators increased from eighty (80) to one-hundred and sixteen (116). The LV generators are smaller in physical size and capacity.

- In addition to the increase in generators, all previous switchgear and power train units have also been transferred to the external plant decks. This allows the western zone in level 1 to be deleted with the exception of the diesel store. The zone in the eastern end will be utilised for additional data halls. The addition of data halls to level 1 will require the lowest level to be set at rl.8.40, previously 9.90.

- Relocation of required carparking to the west and north faces of the building. Carparking moved to allow for water storage tanks at the western end of the car parking area.

- Provision of a safety barrier to the north and south faces of the roof level. Due to the proximity of mechanical plant, perforated screens added to prevent potential falls.

- Goods lift (one off) extended to service roof area, to facilitate maintenance access.

- Passenger lift added to southern face to facilitate pedestrian access to all levels.

- Minor position adjustment to western fire trail to accommodate revised plant platforms.

There are no impacts on the previous approach for landscaping works. Civil works and stormwater management remains unchanged, bulk excavation levels have been adjusted to suit levels associated with platform modifications and level 1 modifications.

The data centre building maintains the same footprint and the same height.

Figure 1 – **Elevations**
(source: AW Edwards, dated 12/11/19)

Section 1 of this assessment provides details of the proposed revised development's compliance with the conditions of consent (B20 – B25), as well as a summary of the changes to the design and the bushfire protection measures afforded to the development.

Section 2 provides further details on the revised generator platform layout and new diesel tank location.

Section 1: Revised scheme's compliance with Planning for Bush Fire Protection 2006 and the NSW RFS recommended conditions

Travers bushfire & ecology prepared an addendum bushfire report in support of the data centre building design in August 2019, followed by a response to the NSW RFS request for additional information in October 2019. The changes to the bushfire protection measures as a result of this amended design are provided as follows:

Asset protection zones

The revised scheme maintains the same data centre building footprint and height. However, the external generator platforms have been amended and the footprint area has increased slightly. For the most part, the generators are set back further from the bushfire hazard, they do however extend closer to the bushfire hazard in some instances (i.e. Generator Platforms 1 & 3 – closer to the northern site boundary, Generator Platform 2 – closer to the east). In addition, the substation location has been amended slightly and has been moved further south by a distance of 6m.

As a result, the APZ dimension has been amended to reflect the new substation and platform locations / extent as depicted in Schedule 1 – Bushfire Protection Measures attached and as follows.

Table 1 – Bushfire attack assessment

Aspect	Vegetation formation within 140m of development	Effective slope of land	Setback provided previously (metres)	Revised APZ dimensions (metres)
Substation				
South	Forest	0-5^{0D}	33	27
West	Forested wetland	5-10^{0D}	36	36
North & east	Managed land / industrial development	N/A	>100	>100
Generator Platform 1				
West	Forested wetland	5-10^{0D}	36	36
North	Forest	5-10^{0D}	**25**	**18 – 23**
Generator Platform 2				
North	Forest	5-10^{0D}	**20**	**16**
	Short heath	0-5^{0D}	16	16
East	Remnant / exotic vegetation	4.5^{0D}	10	4
Generator Platform 3				
North	Remnant / exotic vegetation	4.5^{0D}	10	7-14
East	Forest	0-5^{0D} Cross slope	25	25

Whilst the platform locations have been amended and are located closer to the site boundaries (in some cases) the APZ footprint remains the same, as per the previous design, and will not impact on any bushland areas proposed to be retained on site. These platforms will be constructed using non-combustible material in compliance with bushfire attack level (BAL) FZ.

Whilst the platforms have extended closer to the site boundary, the generators have been setback further from the hazard in most cases and the radiant heat impact on these has not been increased beyond the previous design. In addition, the diesel tanks have been removed from the platforms and are now located within the data centre building (on level 1).

Section 2 of this report provides further detail regarding diesel fuel tank location.

Water, electricity and gas

The revised scheme will maintain compliance with the requirements for water, electricity and gas. No substantial changes to these aspects of the design have been made.

Property access

Property access remains largely unchanged, with the western portion of the road now located on Level 3 of the generator platform, with two (2) generator platforms above. The changes in road design are depicted in Figures 2 & 3 below.

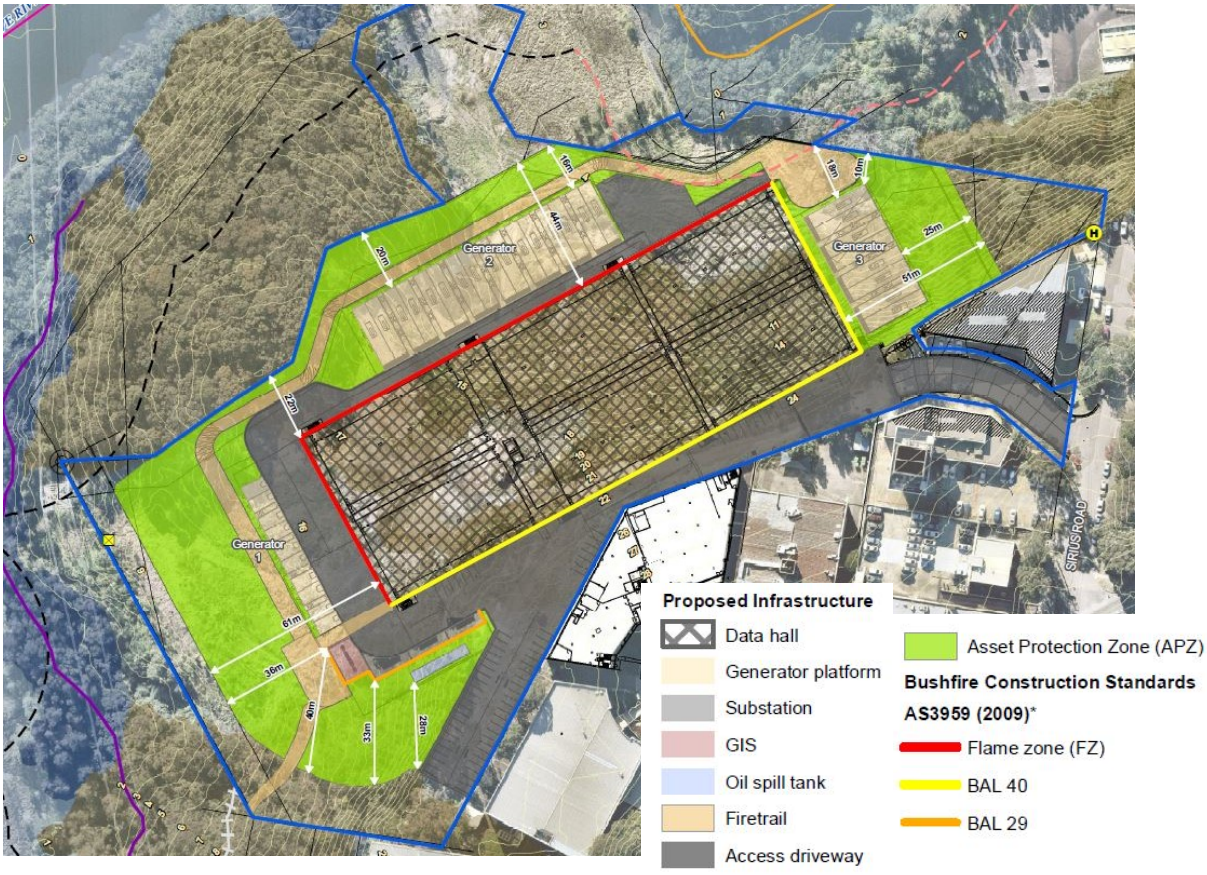


Figure 2 – Access design (August scheme)
(Source: Bushfire Protection Assessment (addendum) prepared by Travers bushfire & ecology, dated August 2019)

Figure 3 – Access design (new scheme)
(Source: Travers bushfire & ecology, dated 20 January 2020)

As depicted above, the revised scheme maintains compliance with the NSW RFS conditions for private roads. Turning heads have been designed to ensure Category 1 fire tankers can undertake a minimum three (3) point maneuver.

Fire trails

The changes to the fire trail design are outlined in Figures 1 & 2 above. The general alignment of the fire trail in the north remains the same, however the fire trail now links with the internal road beneath Generator Platform 2. The private access road now provides access to the eastern boundary of the development.

The revised scheme will comply with the NSW RFS condition to include the following:

- A minimum vertical clearance of 4m is provided to any overhanging obstruction (tree branches or the building itself).
- A passing bay will be provided every 200m (20m long by 3m wide (making a minimum trafficable width of 7m).
- Turning heads will be designed to ensure Category 1 fire tankers can undertake a three (3) point maneuver.

Emergency and evacuation

The revised scheme will maintain compliance with the requirements for emergency evacuation. As outlined in the bushfire protection assessment report, a bushfire evacuation plan will be prepared prior to occupation.

Building construction standards

Data centre
The data centre maintains the same building footprint as per the previous scheme. The roof and northern, western and eastern building facades of the data centre are to comply with BAL FZ. The remaining southern facade can step down to BAL 40. This is consistent with the recommendations from the NSW RFS.

Generator platforms
The location of the proposed generators and diesel fuel tanks has been amended in the new scheme. Whilst the platforms are located closer to the bushfire hazard, the proposed generators (for the most part) are further setback from the bushfire hazard. These platforms will be constructed using non-combustible materials with the generators housed within a non-combustible structure. In addition, the fuel tanks have now been relocated within level 1 of the data hall.

Substation
The revised scheme has resulted in a slight realignment of the substation which has resulted in a decrease in the APZ setback from 33m to 27m. The substation will be open with blast walls between each transformer. The blast walls, suspended roadway deck and APZ will provide the required shielding to prevent flame zone contact and reduce radiant heat impact to the non-enclosed substation elements.

The GIS switch gear will be within a roofed enclosure, the APZ remains the same and it can therefore comply with a BAL 40 construction standard.

Table 2 provides a summary of the proposed revised scheme's compliance with the conditions of consent issued by the NSW RFS, including APZ setbacks, BAL ratings for the building, access, water supply and utilities.

Table 2 – Revised scheme's compliance with NSW RFS conditions

NSW RFS Condition	Response
Condition B20 – At the commencement of construction, and in perpetuity, the Applicant must manage the area around the data centre building and its associated infrastructure as an asset protection zone as outlined in section 4.1.3 and Appendix 5 of *Planning for Bushfire Protection* (RFS, 2006) and *Standards for asset protection zones* (RFS, 2005). This is to be performed as outlined in the addendum bushfire protection assessment for the development prepared by TBE Environmental Pty Ltd (dated 23 August 2019, Ref: 18AWE02.4B).	The APZ dimensions have been amended to reflect the new substation and platform locations / extent as depicted in Schedule 1 – Bushfire Protection Measures attached. As outlined above the proposed data centre maintains the same footprint as per the previous proposal, with the generator platforms extending closer (i.e. <5m) to the northern boundary of the site. It is recommended that this condition is amended to reflect the updated Schedule 1 – Bushfire Protection Measures (18AWE02_BF001, dated 20/1/2020).

NSW RFS Condition	Response
Condition B21 – The Applicant must ensure construction of the following aspects of the development complies with sections 3 and 8 (BAL 40) of *AS 3959-2009: Construction of buildings in bush fire-prone areas* (Standards Australia, 2009) or the *NASH Standard (1.7.14 updated) - Steel Framed Construction in Bushfire Areas* (NASH, 2014) as appropriate and section A3.7, Addendum Appendix 3 of *Planning for Bushfire Protection* (RFS, 2010): (a) south-eastern elevation of the data centre; and (b) the on-site substation.	The revised scheme will maintain compliance with this condition.
Condition B22 - The Applicant must ensure construction of the following aspects of the development complies with sections 3 and 9 (BAL FZ) of *AS 3959-2009: Construction of buildings in bush fire-prone areas* (Standards Australia, 2009) or the *NASH Standard (1.7.14 updated) - Steel Framed Construction in Bushfire Areas* (NASH, 2014) as appropriate: (a) north-eastern elevation of the data centre; (b) north-western elevation of the data centre; (c) south-western elevation of the data centre; and (d) roof of the data centre. Except for windows, flaming of the specimen is not permitted and the must be no exposed timber.	The revised scheme will maintain compliance with this condition.
Condition B23 - The Applicant must ensure construction of the generator platforms and associated diesel fuel storage tanks is undertaken in accordance with the recommended alternate design solution detailed in the 'Generator Insulated Base fuel tank thermal study' for the development, prepared by Parratech Group Pty Ltd (dated 25 October 2019, Rev. C, Ref: P9223-P-381.01).	The revised scheme has resulted in the removal of the diesel fuel storage tanks to inside the data centre building (level 1). As a result this condition should be amended to state the following: Construction of the proposed plant platforms shall comply with Sections 3 & 9 (BAL FZ) of *AS3959 – 2009* or *NASH Standard – 2014* as appropriate.
Condition B24(a) – The provision of water, electricity and gas shall comply with Section 4.1.3 of *PBP 2006.*	The revised scheme will maintain compliance with this condition.
Condition B24(b) – Internal access roads comply with Section 4.1.3 (2) of *PBP 2006.*	The revised scheme is to maintain compliance with this condition.
Condition B24(c) – Fire trails shall comply with section 4.1.3 (3) of *PBP 2006.*	The revised scheme is to maintain compliance with this condition.
Condition B24(d) – Arrangements for emergency and evacuation are to comply with Section 4.2.7 of *PBP 2006*	The revised scheme will maintain compliance with this condition.

NSW RFS Condition	Response
Condition B25– Prior to the commencement of operation, the Applicant must prepare and implement a Bush Fire Emergency Management and Evacuation Plan which is consistent with the requirements of *Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* (RFS, 2014).	The revised scheme will maintain compliance with this condition.

Section 2: Review of diesel fuel tank locations

The diesel fuel storage originally located externally as approved under SSD-9741; has now been re-located within the data centre building on level 1. These will consist of sixteen (16) individual steel tanks located on the northern side of level 1 (refer Figure 4). The diesel store will be bunded to contain any potential fuel leaks or spills. Based on the new location, steel tanks will revert to single walled with leak detection provided to the room itself. The room will be 4-hour fire rated.

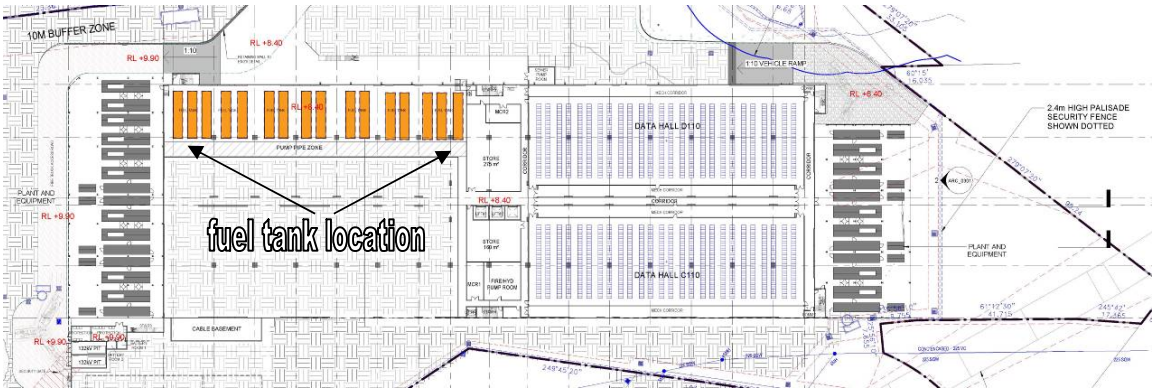


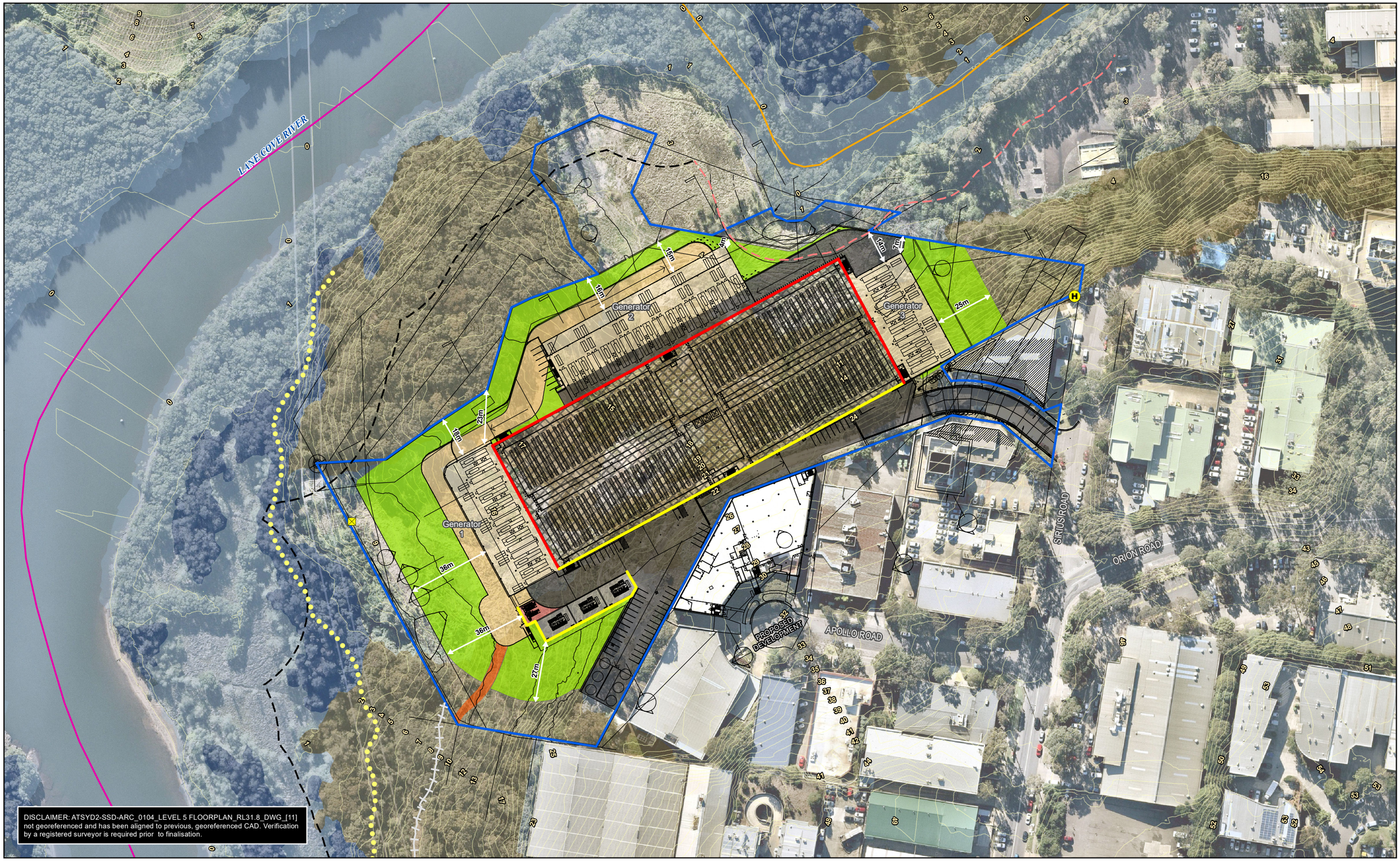
Figure 4 – Level 1 (fuel tank location)
(Source: Greenbox, dated 15 January 2020)

As a result, the proposed relocation of the fuel tanks within the building will not contribute to the bushfire risk posed to emergency services personnel.

Should you require further assistance please contact the undersigned on 02 4340 5331 or at info@traversecology.com.au.

Yours faithfully

John Travers
Principal bushfire consultant - ***Travers bushfire & ecology***



DISCLAIMER: ATSYD2-SSD-ARC_0104_LEVEL 5 FLOORPLAN_RL31.8_DWG_[11] not georeferenced and has been aligned to previous, georeferenced CAD. Verification by a registered surveyor is required prior to finalisation.

Legend

- Subject site (source: CAD)
- Contour (1m) (source: LiDAR)
- Gate (existing)
- Hydrant (existing)
- Unformed road/ access to easement
- Walking track
- Generator/fuel tank location

Proposed Infrastructure

- Data hall
- Generator platform
- Substation
- GIS
- Firetrail
- Track (AUSGRID access)
- Driveway

Vegetation Formation

- Forest
- Forested Wetland
- Saline Wetland (not bushfire prone)

Riparian corridor

- 20m buffer
- 40m buffer

- Asset Protection Zone (APZ)

Bushfire Construction Standards AS3959 (2009)*

- Flame zone (FZ)
- BAL 40

Aerial source: Nearmap

0 20 40 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
1 Sirius Road, Lane Cove West 18AWE02_BF001	4/02/2020 Issue 1 AH	1:1,500 @A3 GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Protection Measures

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