



BUSHFIRE ASSESSMENT REPORT (BAR)

PROPOSED BATTERY ENERGY STORAGE SYSTEM
BUILDINGS OF CLASS 5 TO 8
(PBP, 2019, PART 8 – OTHER DEVELOPMENT)

981 New England Highway, Aberdeen NSW 2336
(LOT 51, DP: 776564)

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Table 1 – Document Version and Disclaimer

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EXECUTIVE SUMMARY

Hunter Valley Bushfire Consulting has been engaged to prepare a Bushfire Assessment Report (this Report) for a Battery Energy Storage System (the development) at 981 New England Highway, Aberdeen, NSW 2336 (Lot 51DP: 776564) (the site).

This report is required to inform a Development Application (DA) to be lodged with Muswellbrook Council because the site is mapped as Bushfire Prone Land (BPL) under the Environmental Planning & Assessment Act 1979 (s10.3 – Bush fire prone land).

This report will also demonstrate how the proposed development conforms with the document titled 'Planning for Bushfire Protection 2019' (PBP). The aim of the PBP is to provide for the protection of human life and minimise the impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment (p.10).

Council must be satisfied that the development conforms to the Bushfire Protection Measures (BPM)s listed within Section 8, Clause 8.3.1 of the PBP under the EP&A ACT 1979 (s4.14 – Consultation and development consent – certain bush fire prone land).

Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives as provided in Clause 8.3.1 (PBP 2019) will be applied in relation to access, water supply and services, and emergency and evacuation planning:

- 1. To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.*
- 2. To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.*
- 3. To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
- 4. To provide for the storage of hazardous materials away from the hazard wherever possible.*

These recommendations have been compiled and written in a specific format below whereby they can be utilised by the consent authority in their development of Conditions of Consent, which would be listed on the Notice of Determination (NoD)

Asset Protection Zones

1. A 10m APZ is to be placed around the development and is to be managed as an Inner Protection Area (IPA) as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protect Zone Requirements)' and the RFS document titled 'Standards for Asset Protection Zones'. The APZ is to be managed and maintained in perpetuity for the life of the development.

Access

2. Property access roads must comply with the following requirements of Table 7.4a of *Planning for Bush Fire Protection 2019*:

- a. Access to the development and the water supply is to be two-wheel drive, all weather access.
- b. the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.
- c. there is suitable access for a Category 1 fire appliance to within 4m of the static water supply.
- d. minimum 4m carriageway width.
- e. a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.

Services - Water

3. The provision of water must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
 - a. a 20,000L static water supply tank must be provided to the development.
 - b. a connection for firefighting purposes is located within the IPA or the western side and away from the structure.
 - c. 65mm Storz outlet with a ball valve is fitted to the outlet.
 - d. ball valve and pipes are adequate for water flow and are metal.
 - e. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
 - f. a hardened ground surface for truck access is supplied within 4m.
 - g. above-ground tanks are manufactured from concrete or metal.
 - h. raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).
 - i. unobstructed access can be provided at all times.
 - j. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
 - k. all exposed water pipes external to the building are metal, including any fittings.
 - l. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.

Services – Power

4. The provision of electricity must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
 - a. where practicable, electrical transmission lines are underground.
 - b. no part of a tree is closer to a power line than the distance set out in accordance with the specifications in *ISSC3 Guideline for Managing Vegetation Near Power Lines*.

Services – Gas

5. The provision of any gas must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
- a. reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
 - b. all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
 - c. connections to and from gas cylinders are metal.
 - d. polymer-sheathed flexible gas supply lines are not used; and
 - e. above-ground gas service pipes are metal, including and up to any outlets; and
 - f. Any gas cylinders that are within 10m of a dwelling:
 - i. Have their release valves directed away from the dwelling, and
 - ii. Are enclosed on the hazard side of the installation, and
 - iii. Have metal connections to and from the cylinders.

6. Any **Hazardous materials** are to be stored on the eastern side of the development.

Note: The above are recommendations of the BAR. Any development approval is to comply with the Conditions listed on the Council Notice of Determination, not the above recommendations. The above recommendations are only intended to assist Council in their assessment of the DA.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains and although the standard is designed to improve the performance of such buildings, there can be no guarantee because of the variable nature of bushfires that any one building will withstand bushfire attack on every occasion.

This report provides the above required information to assist Council in determining compliance in accordance with the PBP and AS 3959-2018. Council is the final consenting authority and the future construction works must comply with the recommendations included in the Council's Notice of Determination for the development.

TERMS & ABBREVIATIONS

APZ	Asset Protection Zone
AS3959	Australian Standard 3959
BAL	Bushfire Attack Level
BAR	Bushfire Assessment Report
BFSA	Bush Fire Safety Authority
BPAD	Bushfire Planning and Design
BPL	Bushfire Prone Land
BPM	Bushfire Protection Measures
DA	Development Application
DBYD	Dial Before You Dig
DP	Deposited Plan
DSF	Dry Sclerophyll Forest
EP&A Act	Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
FPAA	Fire Protection Association of Australia
GIPA	Government Information (Public Access) Act 2009
IPA	Inner Protection Area
LEP	Local Environmental Plan
LGA	Local Government Area
NCC	National Construction Code
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection
RFS	NSW Rural Fire Service
RoW	Right of Way
SEED	Sharing and Enabling Environmental Data
SFPP	Special Fire Protection Purpose

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1.0 INTRODUCTION

1.1 SITE PARTICULARS

Address:	981 New England Highway, Aberdeen NSW, 2336 (the site) (FIGURES 1 & 2).
Legal Description:	Lot 51, DP:776564
Total Area:	819569m2 (approx.)
Local Government Area:	Muswellbrook Council Significant Features: Aberdeen is characterised by rural and village development. The site has direct access via New England Highway, which is a sealed public road (FIGURES 1, 2 & 3).
Bushfire Prone Land Map:	The site is identified as BPL, being Category 2 (FIG.3).
Land Zoning:	RU1– Primary Production
Environmental Features:	The site is mapped as containing Biodiversity Values under the Biodiversity Conservation Act 2016. There is no tree removal involved in this development.
Climate/Fire History:	<p>The Muswellbrook Bushfire Management Committee, 2011, 'Bushfire Risk Management Plan' (the Plan) identifies several assets in the Muswellbrook Local Government Area 2009. This Plan does map the site as an 'Asset – Human -Residential'.</p> <p>The Fire History Map that is available from the Sharing and Enabling Environmental Data (SEED) Portal on 25 May 2023 has not identified a recorded history of fires in proximity to the site.</p>
Fire Trails:	The Plan does not identify any fire trails that exist on the Aberdeen property that are on the Rural Fire Act (s.620 - Register of Certified Fire Trails).

1.2 SCOPE

The scope of this BAR is to identify the bush fire hazard and provide measures to assist Council and the RFS that the identified fire hazard would be reduced to a level that is considered necessary to provide adequate protection to life and property.

This BAR provides the required information to assist Council and the RFS in determining compliance in accordance with the PBP and AS3959-2018. Council is the final consenting authority and the future construction works must comply with the conditions listed in the Notice of Determination issued by Council.

1.3 PROPOSAL

The proposal is for a Battery Energy Storage System (the development) (**ATTACHMENT 1**).

Under the Muswellbrook Local Environmental Plan 2009, ***electricity generating works*** means a building or place used for the purpose of—

- (a) making or generating electricity, or
- (b) electricity storage.

The development is defined as ‘other development’ under PBP and could be defined under the National Construction Code (NCC) as follows:

- 1. Class 8 – “A building in which the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce for sale takes place.”

An illustration of the proposed siting of the development is provided as (**FIGURES 1 & 2**).

1.4 ASSUMPTIONS OF THIS REPORT

The following assumptions have informed this BAR:

- 1. Architectural Plans provided as (**ATTACHMENT 1**).
- 2. Access to private properties, other than the site was not provided, so photos taken during the site inspection are from public areas, such as the road reserve.
- 3. The BAR will be assessed by Council who will develop conditions of consent. Any construction must comply with the conditions issued by Council, not this BAR.

FIGURE 1 – Locality Map.

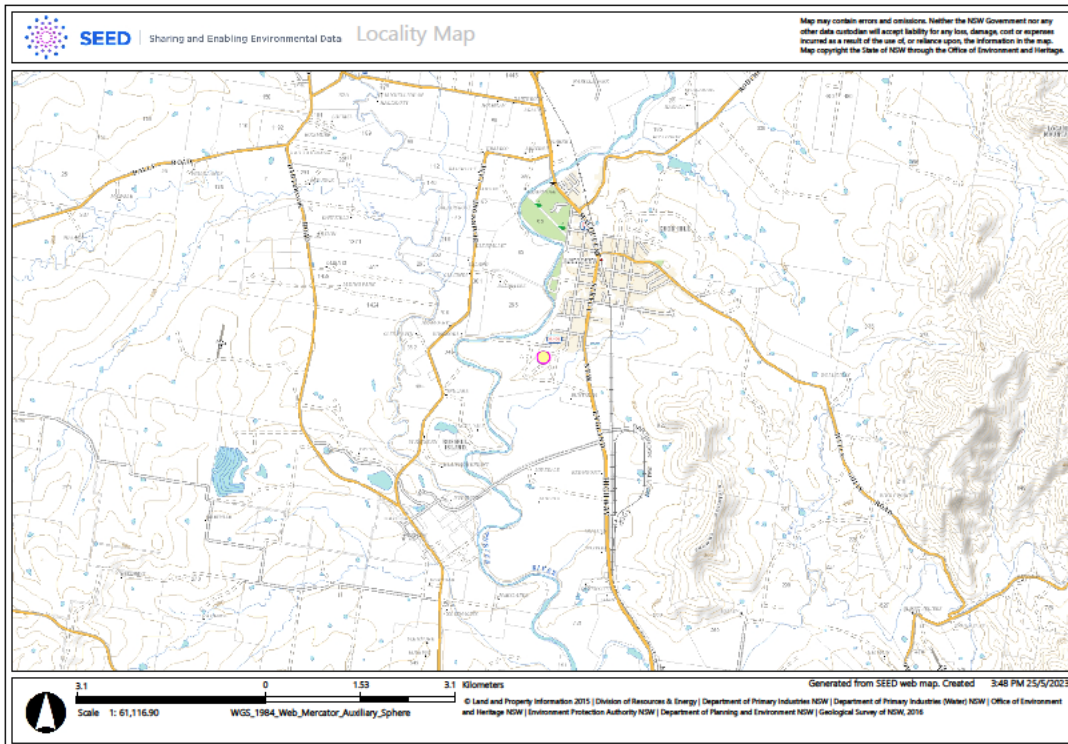


FIGURE 2 – Site Map.

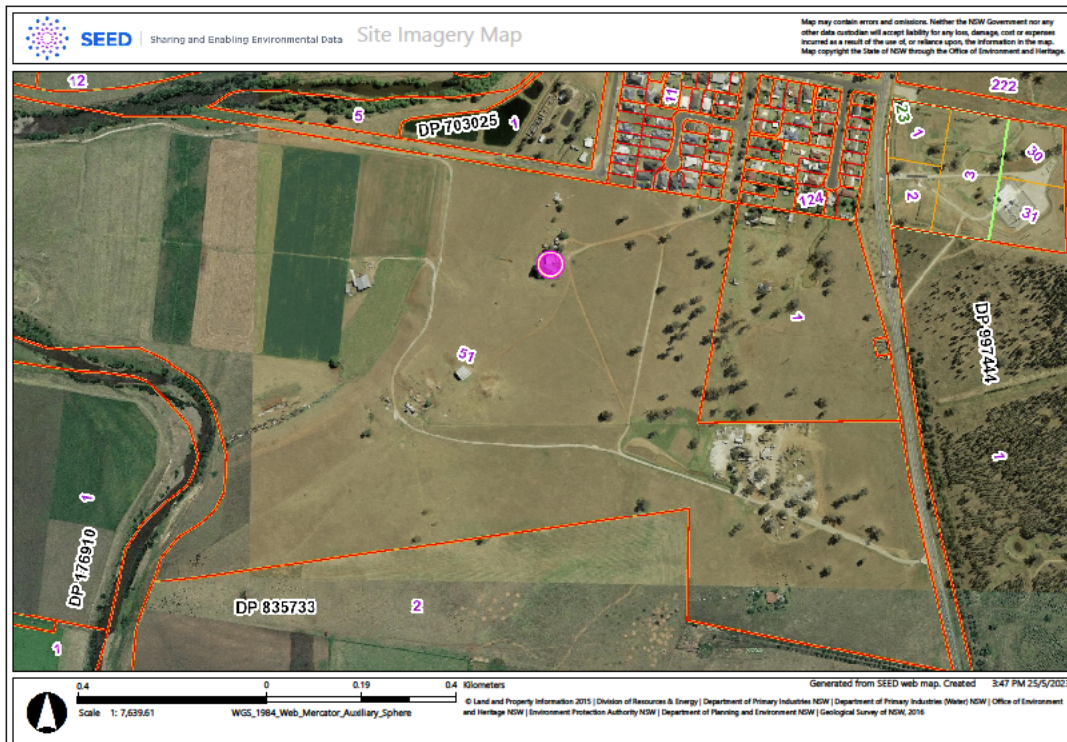
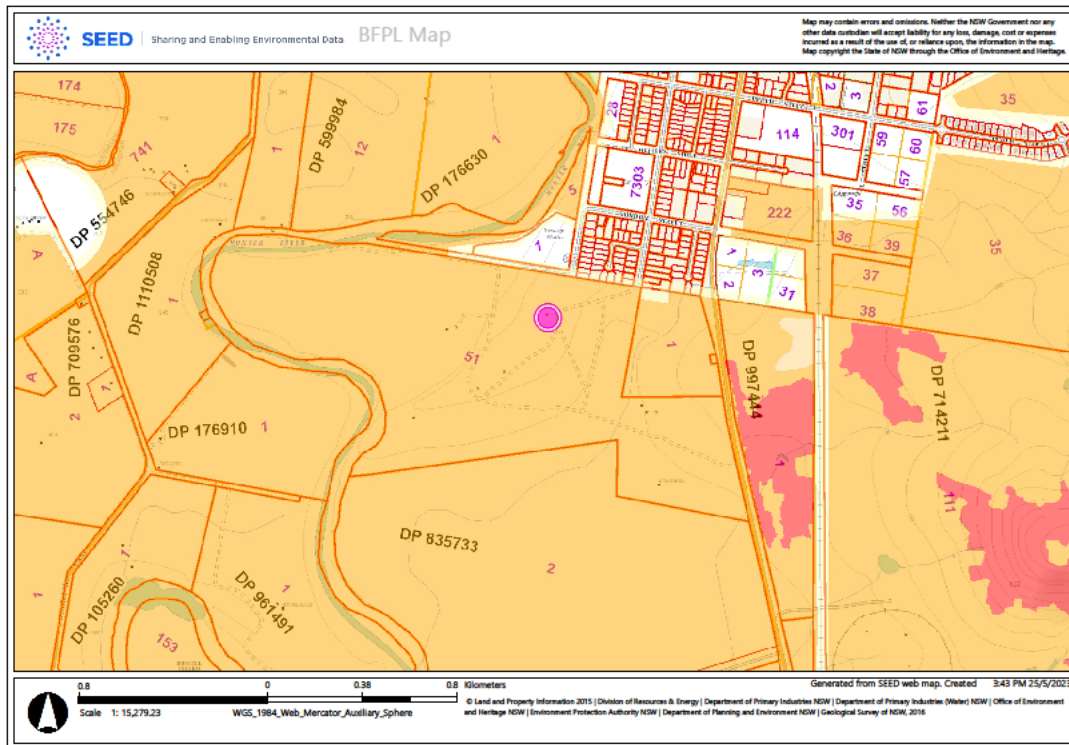


FIGURE 3 – Bushfire Prone Land Map.



FIRE PROTECTION MEASURES

The document titled 'Planning for Bushfire Protection (Section 8.3.1) 2019' (p.76) states:

'The NCC does not provide for any bush fire specific performance requirements for these particular classes of buildings. As such AS3959 and the NASH Standard are not considered as a set of Deemed to Satisfy provisions, however compliance with AS3959 and the NASH Standard must be considered when meeting the aims and objectives of PBP.'

In addressing the objectives listed in Clause 8.3.1 of the PBP 2019, for Class 5-8 buildings, a response summary is provided in Table 2 below:

Table 2 – Objectives and Compliance Summary

No	Objective	Response
1	To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupancy egress for evacuation.	Direct vehicular access to the development is to be provided off the New England Highway, which is a sealed road. Two-wheel drive, all weather access is to be provided. This access is also to be provided to the dedicated firefighting water supply.
2	To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.	The development is a structure and will not be occupied, therefore no evacuation arrangements are required for occupants. Emergency vehicles however will be able to access and exit the site directly from New England Highway.
3	To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to located gas and electricity so as not to contribute to the risk of fire to a building.	The development is to be serviced by a dedicated firefighting, water supply (20,000L water tank). The development is not habitable or occupied and only serves as infrastructure for the supply of a utility (electricity). A recommendation is to be placed below regarding electricity/gas supply.
4	To provide for the storage of hazardous materials away from the hazard where possible.	It will be recommended that storage of any hazardous materials should be on the east elevation of the building. The vegetation hazard is grassland.

USE 8.3.9 - HAZARDOUS INDUSTRY

Under Clause 8.3.9 of PBP 2019 (p.79), power (electricity) generating works are described as Hazardous Industry. Such developments have an ability to start a bushfire as well as being susceptible to bushfire impact when located on bushfire prone land. It is recommended in this clause to prepare a performance-based solution or bushfire design brief. A performance solution is not considered necessary for this development. As discussed in Table 2 above, the objectives listed in Clause 8.3.1 PBP 2019 (p.76) can be met. This development is not occupied and consists of multiple enclosed, non-combustible structures. Direct access to these structures for emergency vehicles is to be provided together with a dedicated firefighting 20,000L water tank for emergency vehicles to connect to. As recommended in Clause 8.3.5 PBP 2019 (p.77) "Wind and Solar Farms" a 10m APZ is to be implemented around the development and be managed and maintained in perpetuity.

3.0 RECOMMENDATIONS

This Report provides a series of responses to demonstrate how the development complies with PBP. These recommendations have been compiled and written in a specific format below whereby they can be utilised by the consent authority in their development of Conditions of Consent, which would be listed on the Notice of Determination (NoD)

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 - g. above-ground tanks are manufactured from concrete or metal.
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 - i. unobstructed access can be provided at all times.
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- relevant authorities, and metal piping is used.
- b. all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
- c. connections to and from gas cylinders are metal.
- d. polymer-sheathed flexible gas supply lines are not used; and
- e. above-ground gas service pipes are metal, including and up to any outlets; and
- f. Any gas cylinders that are within 10m of a dwelling:
 - i. Have their release valves directed away from the dwelling, and
 - ii. Are enclosed on the hazard side of the installation, and
 - iii. Have metal connections to and from the cylinders.

6. Any Hazardous materials are to be stored on the western side of the development.

Note: The above are recommendations of the BAR. Any development approval is to comply with the Conditions listed on the Council Notice of Determination, not the above recommendations. The above recommendations are only intended to assist Council in their assessment of the DA.

CONCLUSION

This BAR has demonstrated that the proposed development is able to comply with the objectives detailed in Clause 8.3.1, Clause 8.3.5, and Clause 8.3.9 of the PBP 2019.

REFERENCE LIST

NSW Government, 2015, 'E-Planning Portal', viewed 25 May 2023, <<https://www.planningportal.nsw.gov.au/find-a-property>>

NSW Government, 2019, 'Biodiversity Vales Map and Threshold Tool', viewed 25 May 2023, <www.lmbc.nsw.gov.au>

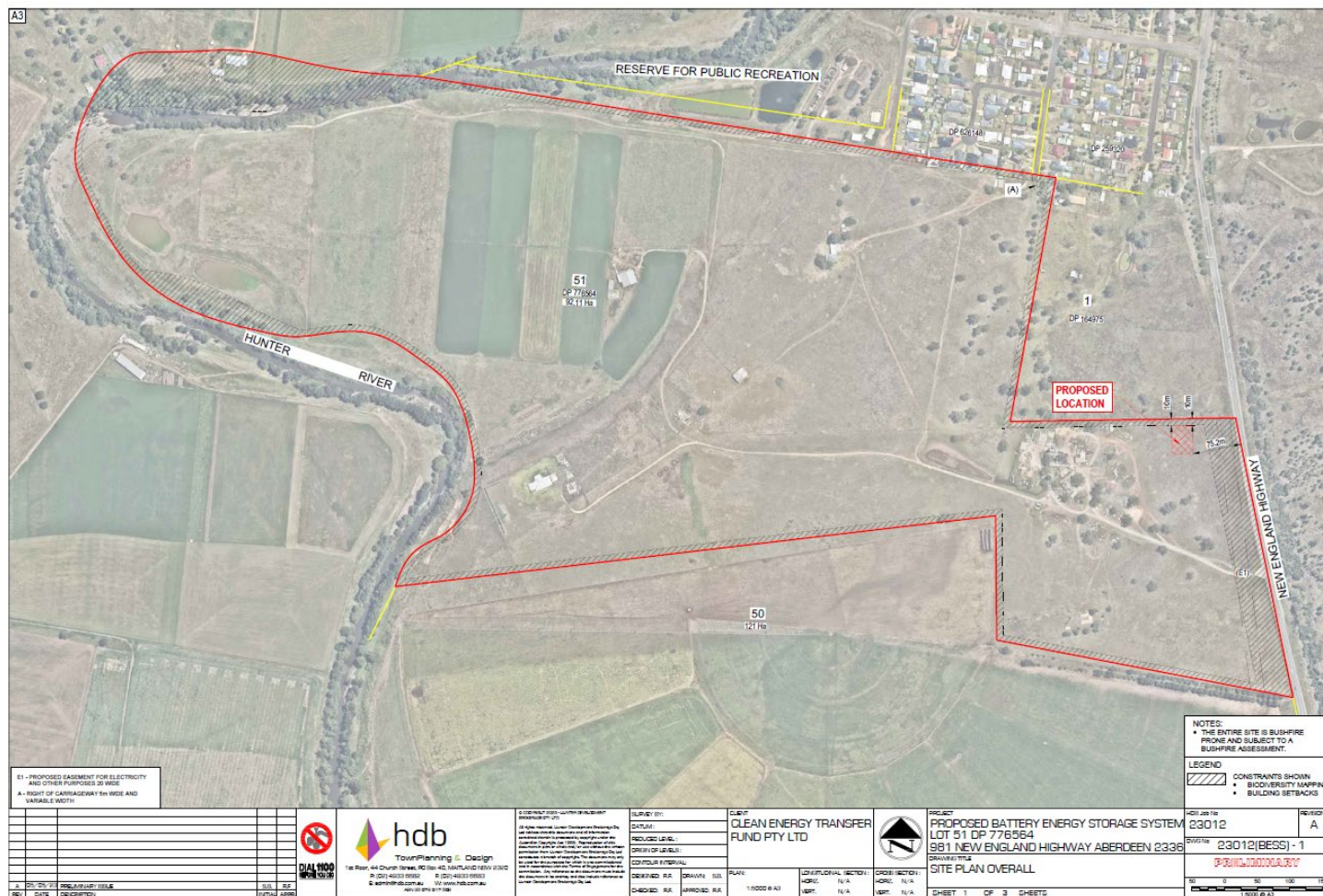
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NSW Office of Environment, 2016, 'Aboriginal Heritage Information Management System (AHIMS)', viewed 25 May 2023, <<http://www.environment.nsw.gov.au>>

NSW Rural Fire Service, 2016, 'NSW Rural Fire Service – Guide for Bush Fire Prone Land Mapping', viewed 25 May 2023<<http://www.rfs.nsw.gov.au>>

NSW Rural Fire Service, 2019, 'Planning for Bushfire Protection', viewed 25 May 2023, < <http://www.rfs.nsw.gov.au>

ATTACHMENT 1



ST2752UX

Liquid Cooling Energy Storage System

Preliminary



LOW COSTS

- Highly integrated ESS for easy transportation and O&M
- All pre-assembled, no battery module handling on site
- 8-hour installation to commission, drop on a pad and make electrical connections



SAFE AND RELIABLE

- DC electric circuit safety management includes fast breaking and anti-arc protection
- Multi-level battery protection layers formed by discreet standalone systems offer impeccable safety



EFFICIENT AND FLEXIBLE

- Intelligent liquid cooling ensures higher efficiency and longer battery cycle life
- Modular design supports parallel connection and easy system expansion
- IP55 outdoor cabinet and optional CS anti-corrosion



SMART AND ROBUST

- Fast state monitoring and faults record enables pre-alarm and faults location
- Integrated battery performance monitoring and logging

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