Iberdrola Australia

ARCADIS

SMITHFIELD BATTERY ENERGY STORAGE SYSTEM

Environmental Impact Statement

November 2023
SSD-59325460

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STATEMENT OF VALIDITY

Submission of Environmental Impact Statement Prepared under Part 4, Division 4.12(8) of the *Environmental Planning and Assessment Act 1979*, and Schedule 2, Part 3, Clause 7(1)(e) of the *Environmental Planning and Assessment Regulation 2000*	
Environmental Assessment prepared by:	
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Address:	Level 16, 580 George Street Sydney NSW 2000
Applicant Name:	Iberdrola Australia Limited
Applicant Address:	Governor Phillip Tower Level 22, 1 Farrer Place, Sydney, NSW 2000
Proposed development:	The Project involves the construction and operation of a large-scale Battery Energy Storage System (BESS) at Smithfield Energy Facility (SEF), NSW. The BESS will be up to 72 Megawatts (MW) and would provide up to 260 Megawatt hours (MWh) of battery storage capacity. Key features of the Project include: • A BESS facility including battery enclosures, inverters, transformers, switch room and control room • Medium voltage cables between the transformers and the existing switchgear building in the northeast corner of the SEF • Switchgear building upgrades to facilitate connection of the BESS • Site access to the BESS from Herbert Place • Utilities to support operation of the BESS • Stormwater management infrastructure, lighting, fencing and security. Site establishment and construction would include: • Preparation at ground level to accommodate the installation of footings for the BESS • Delivery, installation and fit out of the BESS, including design mitigation elements • Construction of ancillary elements • Installation of permanent fencing for the BESS. It is assumed that the existing security systems would be upgraded to include the BESS • Testing and commissioning • Removal of construction equipment and materials and rehabilitation of construction and laydown areas (where applicable)

Submission of Environmental Impact Statement Prepared under Part 4, Division 4.12(8) of the *Environmental Planning and Assessment Act 1979*, and Schedule 2, Part 3, Clause 7(1)(e) of the *Environmental Planning and Assessment Regulation 2000*	
Land to be developed:	A summary of the legal description (i.e. Lot and Deposited Plan (DP) references) of the Project Site includes: • Lot 33, DP850596 Subject to further consultation, temporary works may occur on: • Lot 1000, DP1077000 • Lot 2, DP849480 • Lot 34, DP850596
Environmental Impact Statement:	An Environmental Impact Statement (EIS) is attached which addresses all matters in accordance with Part 4, Division 4.12(8) of the *Environmental Planning and Assessment Act 1979*, and Schedule 2, Part 3, Clause 7(1)(e) of the *Environmental Planning and Assessment Regulation 2000*. I certify that I have prepared the contents of this EIS in accordance with the Secretary's Environmental Assessment Requirements (SEARs) (No. SSD-59325460) dated 13 July 2023, and that to the best of my knowledge, the information contained within this EIS is not false or misleading.
Signature:	
Name:	Javier Valderrama
Date:	2 November 2023

Acronyms and Abbreviations

Acronym	Definition
AADT	Annual average daily traffic
AAQ NEPM	National Environment Protection (Ambient Air Quality) Measure
AC	Alternating Current
AEMO	Australian Energy Market Operator
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
Arcadis	Arcadis Australia Pacific Pty Limited
B&C SEPP	*State Environmental Planning Policy (Biodiversity and Conservation) 2021*
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BOM	Bureau of Meteorology
CBA	Contamination Baseline Assessment
CBD	Central business district
CCGT	Combined Cycle Gas Turbine
CEMP	Construction Environmental Management Plan
CIV	Capital investment value
CLM Act	*Contaminated Land Management Act 1997*
CNMP	Construction Noise Management Plan
CTMP	Construction Traffic Management Plan
DA	Development application
dB(A)	Decibel, A-weighted
DC	Direct Current
DCP	Development Control Plan
DCCEEW	Department of Climate Change, Energy, Environment and Water (Commonwealth)
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DoP	Department of Planning (NSW)
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment (now DPE)
EIS	Environmental Impact Statement

Acronym	Definition
Electricity Infrastructure Roadmap	NSW Electricity Infrastructure Roadmap
EMF	Electric and magnetic fields
EP&A Act	*Environmental Planning and Assessment* Act 1979
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021*
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation* Act 1999
EPL	Environmental protection licence
ERA	Environmental Risk Assessment
ESD	Ecologically sustainable development
FCAS	Frequency Control Ancillary Services
FRNSW	Fire and Rescue NSW
GW	Gigawatt
HAZID	Hazard Identification
HIPAP	Hazardous Industry Planning Advisory Paper
HVAC	Heating, ventilation and air conditioning
Hz	Hertz
Iberdrola	Iberdrola Australia Limited
ICNG	Interim Construction Noise Guideline
ICNIRP	International Commission on Non-Ionizing Radiation Protection
L_{Aeq}	Equivalent continuous sound level
LEP	Local Environmental Plan
LETS	Low Emissions Technology Statements
LFP	Lithium Iron Phosphate
LGA	Local Government Area
LoS	Level of service
LSBS	Large Scale Battery Storage
m	Metres
MLRA	Multilevel Risk Assessment Guideline
MNES	Matter of National Environmental Significance
MW	Megawatt
MWh	Megawatt Hours
NEM	National Electricity Market
NEPC	National Environment Protection Council

Acronym	Definition
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
NPI	National Pollutant Inventory
NPfI	Noise Policy for Industry
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
OEH	Office of Environment and Heritage
OCGT	Open Cycle Gas Turbine
OEMP	Operational Environmental Management Plan
OSD	Onsite stormwater detention
OSOM	Oversize overmass
PFAS	Per and poly-fluoroalkyl substances
PHA	Preliminary Hazard Analysis
Planning Systems SEPP	*State Environmental Planning Policy (Planning Systems) 2021*
$PM_{2.5}$	particulates of aerodynamic diameter <2.5 µm
PM_{10}	particulates of aerodynamic diameter <10 µm
PMF	Probable Maximum Flood
POEO Act	*Protection of the Environment Operations Act 1997*
Project Site	The parcel of land on which the Project operations will be located
PSI	Preliminary Site Investigation
RBL	Rating background level
R&H SEPP	*State Environmental Planning Policy (Resilience and Hazards) 2021*
SCADA	Supervisory control and data acquisition
SEARs	Secretary's Environmental Assessment Requirement
SEF	Smithfield Energy Facility
Sensitive receiver	Residence, educational institution, health care facility or place of worship
Smithfield Energy Facility	The power station owned and operated by Smithfield Power Generation Pty Ltd
SSD	State Significant Development
SSD guidelines	*State significant development guidelines – preparing a scoping report* (DPE, 2022)
TfNSW	Transport for New South Wales
T&I SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
TIA	Traffic Impact Assessment
the Electricity Strategy	*NSW Government's Electricity Strategy*
The Project	The project for which approval is being sought, namely the construction, operation and maintenance of a Battery Energy Storage Station

Acronym	Definition
The Proponent	Smithfield BESS Pty Ltd, as owned Iberdrola Australia Limited
RAV	Restricted access vehicle
RF Act	*Rural Fires Act 1997*
the Transmission Infrastructure Strategy	*NSW Transmission Infrastructure Strategy*
Visy	Visy Industries Pty Ltd
Visy site	Visy Smithfield Recycling Facility
WM Act	*Water Management Act 2000*
2022 ISP	2022 Integrated System Plan for the National Electricity Market
2020 ISP	2020 Integrated System Plan for the National Electricity Market

EXECUTIVE SUMMARY

Introduction

Smithfield BESS Pty Ltd as owned by Iberdrola Australia Limited (Iberdrola) (the Proponent) is seeking development consent for the construction, operation and maintenance of a large-scale Battery Energy Storage System (BESS) at the Smithfield Energy Facility (SEF) (Lot 33, DP850596) located at 6 Herbert Place, Smithfield NSW 2164 (the Project Site). The BESS would have a capacity of up to 72 Megawatts (MW) and up to 260 Megawatt-hours (MWh) of battery storage capacity (the Project).

Proponent

The Proponent is Smithfield BESS Pty Ltd, a subsidiary of Iberdrola Australia Limited. Smithfield BESS Pty Ltd would own and be responsible for operation of the Project. Iberdrola Australia Limited (ABN 39 105 051 616) are an owned entity of the Iberdrola Group. Iberdrola S.A. is the ultimate parent company of the entire Iberdrola Group and owns 100% of Iberdrola Australia Limited.

The Iberdrola Group is the number one producer of wind power by volume globally, and one of the world's largest electricity utilities by market capitalisation. Iberdrola Group's global expertise spans renewable energy, electricity networks, smart grids, large-scale energy storage, energy innovation and digitisation, and advanced customer products. The Iberdrola Group owns and operates 53 gigawatts (GW) of installed generating capacity, including over 40 GW of installed renewables capacity owned. They also have a further 7 GW of generating capacity contracted.

Iberdrola Australia Limited is a leader in renewable energy and has been operating renewable energy assets locally for over 15 years. Iberdrola Australia Limited is a long-term developer, operator and owner, and manages all aspects of the project lifecycle. It currently has a 1.4 GW portfolio of renewable assets under operation or construction in Australia, which is supported by 320 MW of firming capacity. Iberdrola has strong growth ambitions in supporting Australia in meeting its various clean energy targets and continue to provide reliable and affordable clean energy to its customers. It will be investing $2 billion in Australia by 2025.

Site Context

The Project would be located within an existing industrial area (the Smithfield Recycling and Manufacturing Precinct) and within an area already used for energy dispatch services. The Smithfield Energy Facility (SEF) has been in operation since 1996 and was originally designed and operated as a Combined Cycle Gas Turbine (CCGT or cogeneration) power plant, supplying both electricity to the NSW electricity grid and heat in the form of steam to the adjacent Visy site. Since 2017, the SEF has operated as an Open Cycle Gas Turbine (OCGT or peaking plant) only supplying electricity to the NSW electricity grid during periods of peak demand and no longer supplies steam to the adjacent Visy site.

The Project Site is suitable for the proposed development as it is consistent with other existing uses at the site, is appropriately zoned for energy infrastructure and is on land that is leased by the Proponent. The location of the BESS facility is proposed in an area which is expected to be vacant following the approved removal of redundant SEF infrastructure which is being sought under a separate development application (DA94/165-MOD3).

Alternative sites within and near the SEF were also considered through the site selection exercise. The key limiting factors to an alternative site were identified as being potential increased costs and environmental impacts associated with the acquisition of a suitable property and the increased extent of connecting infrastructure between the BESS and Guildford substation.

Project need and objectives

Over the last 10-15 years, there has been a steady increase in the number of renewable projects which have come online and are generating electricity for use in the National Energy Market (NEM), while more of the older traditional coal fired power stations have been retired and decommissioned. This transition from thermal generation to renewable generation is expected to continue into the future. To support this transition, energy storage will be required to support the intermittent nature of generating electricity from renewable energy sources and to provide a reliable and secure source of electricity to consumers and the local population.

The Federal, State and Local Governments have put in place a number of plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. These include:

- *2020 Integrated System Plan for the National Electricity Market* (2020 ISP) (Australian Energy Market Operator (AEMO), 2020)
- *The Transmission Infrastructure Strategy* (DPIE, 2018)
- *The Electricity Strategy* (DPIE, 2019)
- *Electricity Infrastructure Roadmap* (DPIE, 2020)
- *NSW Climate Change Policy Framework* (NSW Office of Environment and Heritage (OEH), 2016)

Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, i.e. firm generation (such as gas and battery storage), dispatch electricity into the grid. This energy generation and supply system can satisfy electrical demand so long as there is sufficient firm generation capacity to meet the system's electricity demand.

Without the development and operation of short and long-term dispatch infrastructure to support increasing investment, there is the potential for future deficit in capacity and reliability of the NSW power supply system. In a worst-case scenario, this can lead to load shedding or blackout events.

The Project involves the development of a large-scale BESS. BESS facilities, such as that proposed by the Project, would provide short duration storage, frequency control ancillary services (FCAS) (to provide a fast injection of energy, to manage supply and demand) and help firm variable renewable energy generation.

Overall, the objectives of the Project are to:

- Increase firming infrastructure and the potential for additional renewable energy assets to be built in NSW
- Improve the security, resilience and sustainability of NSW's electricity grid
- Help reduce the direct carbon emission of the NSW's electricity grid (by not relying on traditional fossil fuel firming assets)
- Minimise adverse impacts on the environment and community during construction and operation.

Project description

The Project would involve construction and operation of the following:

- A BESS including battery enclosures, inverters, transformers, switch room and control room
- Medium voltage cables between the transformers and the existing switchgear building in the northeast corner of the SEF
- Switchgear building upgrades to facilitate connection of the BESS
- Site access to the BESS from Herbert Place
- Utilities to support operation of the BESS
- Stormwater management infrastructure, lighting, fencing and security.

The BESS would operate 24 hours a day, seven days a week.

Key construction activities are expected to include:

- Site enabling works, including:
  - Establishment of temporary environmental and safety controls
  - Establishment of construction laydown areas, as required, in consultation with landowners
  - Utility works (including disconnections) to enable construction
  - Establishment of temporary construction site offices at the laydown area
  - Surveying and investigations of onsite condition to implement final design (where required).
- Earthworks, levelling, and other civil and ground preparation activities, including the removal of spoil from the Project Site, as required
- Delivery, installation and electrical fit-out for the Project, including control building, battery enclosures, inverters, transformers and associated cabling and infrastructure
- Connections between the BESS and the existing SEF switchgear building
- Establishment of fire safety envelope setbacks and firefighting systems
- Permanent environmental management and pollution control measures
- Testing and commissioning
- Removal of construction equipment and rehabilitation of construction areas

Planning Approval Pathway and Statutory Context

The Project is considered to meet the definition of State Significant Development under Clause 2.6 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). The Project would be for electricity generating works on land that is permitted with development consent under Clause 2.35 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) and would have a capital investment value (CIV) greater than $30 million. The CIV of the Project is estimated to be $93 million.

Community and stakeholder engagement

Community and stakeholder engagement for the Project is being undertaken in accordance with *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022) and *Iberdrola Australia's Community and Stakeholder Engagement Policy* (Iberdrola Australia, 2023). Community and stakeholder engagement activities regarding the Project commenced in early 2023.

Several agencies and interested stakeholder were consulted during the preparation and assessment of the Project via meetings, telephone conversations, email and/or letter correspondence, including:

- Department of Planning and Environment (DPE), including:
  - Biodiversity, Conservation and Science (BCS)
  - Hazard
- Fire and Rescue New South Wales (FRNSW)
- Cumberland City Council
- NSW Environmental Protection Authority (EPA)
- Transport for New South Wales (TfNSW)
- Jemena.

Community consultation activities undertaken to date include:

- Development of a dedicated website (https://www.iberdrola.com.au/our-assets/development-assets/smithfield-battery)
- Community newsletters
- Face to face door knocks and one on one meetings
- Provision of enquiry lines (for phone and email).

A range of feedback was provided through these engagement activities. The sentiment from engagement activities was generally neutral to broad support of the Project. Support was generally associated with the renewable energy transition and the initiative to support the integrity of the NSW power supply.

Some local issues were raised by various stakeholder groups during the preparation of the Scoping Report and the Environmental Impact Statement (EIS). These issues focused largely on the risk of fire, traffic, noise and water to neighbouring receptors.

Stakeholders will continue to be identified and consulted during the approvals and response to submission phase, and if approved, during the construction, operation, and decommissioning and rehabilitation phases of the Project.

Environmental issues

A summary of the environmental issues, as identified within the Secretary's Environmental Assessment Requirements (SEARs) is provided in Table 1-1.

Table 1-1 Summary of the environmental issues

Environment issue	Potential construction and operational impacts
Traffic and Transport	A Traffic Impact Assessment (TIA) was undertaken by Arcadis (Chapter 8 and Appendix C). The TIA assessed the potential traffic, transport and access impacts associated with the Project. **Construction** Construction traffic movements are anticipated to comprise: • Up to 30 passenger vehicles per day (30 in and 30 out) during the construction • Up to 15 heavy vehicles per day (15 in and 15 out) during the construction • No or minimal OSOM vehicles during the construction. Traffic generated during construction of the Project is not expected to compromise safety or function of the surrounding road network and impacts during morning and evening peak periods are expected to be minimal. No road access upgrades have been identified as being required to enable delivery and / or access to the Project Site. All vehicular access to the Project Site required for construction and operation would be via Herbert Place. **Operation** Minimal vehicle movements are anticipated during operations. The Project will contribute an additional employee at the SEF, primarily for scheduled maintenance. It is expected that there may be some irregular heavy vehicle movements during operation for maintenance activities, such as replacing of battery components etc, however these movements are expected to be infrequent and would have a negligible impact on the road network. Therefore, the Project would have a negligible impact on surrounding road network performance. **Mitigation measures** Measures to manage traffic during construction of the Project would be included in the Construction Traffic Management Plan (CTMP) as part of the Construction Environmental Management Plan (CEMP). The CTMP would outline how construction vehicles would move in and out of the Project Site to ensure the safety of the SEF and neighbouring businesses.
Noise and Vibration	An assessment of the potential construction and operational noise and vibration impacts associated with the Project was undertaken by Benbow Environmental (Chapter 9 and Appendix D). Noise management levels and vibration criteria were developed in accordance with the relevant NSW guidelines and policies. **Construction** Construction activities are proposed to take place during standard construction hours. A review of potential construction noise impacts was undertaken and determined that construction works are expected to comply with construction noise criteria at all receivers. **Operation** Noise levels comply at all residential receptors for all weather conditions during all time periods. A residual noise impact above the Project Noise Trigger Levels is predicted at one receiver, the neighbouring industrial facility to the north of the Project Site (Lot 1000 DP1077000) (Kingspan) by 1 dB(A). This 1 dB(A) exceedance of the criteria (68 dB(A)) is primarily associated with the hardstand area, located adjacent north of the BESS and which is currently being used as a truck depot/material storage area. The Project Noise Trigger Level is not predicted to exceed the criteria at the existing neighbouring industrial buildings.

Environment issue	Potential construction and operational impacts
	The noise modelling undertaken for the Project is based on a fan duty consisting of 100% battery fan operations, and 20% power electronic (PE) fan operations, where all battery units are operating at 100% load, in conjunction with the SEF power plant. This would only occur during the hottest days of the year (5% of the time on the hottest days of the year). In practice most of the time (>95% of the time over the year) the PE fans would operate at 20% duty or less and the battery fans would operate at 40% duty or less. Under these typical conditions the noise levels from each BESS unit is predicated to be more than 10 dB(A) less than those modelled as worst-case and would achieve compliance at all receptors, including the neighbouring industrial site. **Mitigation measures** A Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented as part of the CEMP and would identify feasible and reasonable approaches to reduce noise and vibration impacts during construction of the Project. Works would be programmed to occur during standard working hours only. If works must occur out of hours for justified reasons, the out of hours works would be separately assessed with appropriate noise mitigation and community consultation implemented as necessary based on the level of predicted impact. The Operational Environmental Management Plan (OEMP) would include measures and processes for managing noise resulting from the operation of the Project, including a process for managing complaints.
Hazards and Risk	A hazard and risk screening analysis was undertaken by Sherpa Consulting to identify potential hazards and risks during construction and operation of the Project. The Preliminary Hazard Analysis (PHA) for the Project is provided in Appendix E and is summarised in Chapter 10. The PHA was prepared in accordance with the relevant guidelines. It was determined the potential risk to people, property and the biophysical environment that may occur because of the accidental release of potential hazardous material and energy, in accordance with Hazardous *Industry Planning Advisory Paper (HIPAP) No.6 – Hazard Analysis* (DoPE, 2011), would trigger the requirement for a PHA. The PHA assessed the events associated with proposed operation of the BESS, as well as potential hazard interactions with the existing SEF. Key hazards and risks associated with the Project include exposure to voltage, release of energy (i.e. arc flash), fire, release of hazardous materials, generation of explosive gas, battery thermal runaway, unignited and ignited release from the SEF gas yard and exposure to Electric and Magnetic Fields (EMFs). The Project operational boundary was used to define and determine off-site impact (i.e. impact extending outside of the Project operational boundary). The risk results for the identified hazard events were identified as not having significant off-site impacts (i.e. serious injury and/or fatality) and based on the study risk acceptance criteria and implementation of recommendations, the risk profile for the proposed BESS would be considered acceptable. Additionally, the identified events are expected to present negligible societal risk impact as the proposed BESS facility will be located at the existing SEF which is in an area zoned industrial with limited number of people within the consequence footprint. A qualitative assessment against the *HIPAP No. 4 - Risk Criteria for Land Use Safety Planning* risk criteria was also undertaken. The Project was found to comply with all criteria. **Mitigation measures** Mitigation measures have been identified to be implemented during detailed design and during construction and operation. This would include, but is not limited to, undertaking a Final Hazard Analysis (FHA), a Fire Safety Study (FSS) and implementation of an operational emergency response plan.
Land and Contamination	An assessment of land and contamination was undertaken in consideration of the relevant guidelines and legislation. The assessment is informed by a Preliminary Site Investigation (PSI) completed by Arcadis, which has been provided in Appendix F of this EIS and summarised in Chapter 11.

Environment issue	Potential construction and operational impacts
	The risk of exposing potential contamination is considered to be low. The SEF is predominantly hardstand with large buildings, and extensive areas covered with concrete or asphalt, and it is unlikely that a contamination risk to human and ecological receptors will eventuate given the background review of contamination for the site and the proposed activities. Therefore, the construction and operation of the Project is not anticipated to result in contamination impact. **Mitigation measures** An Unexpected Finds Protocol will be included in the CEMP to manage any disturbance of material that is odorous, stained or containing anthropogenic materials, in the event these are encountered during construction. The OEMP prepared for the Project will include measures to manage any spills that occur during operation.
Water quality, flooding and water use	An assessment of the potential construction and operational water related impacts associated with the Project was undertaken by Arcadis (Chapter 12 and Appendix G). **Construction** Construction activities, if not managed properly, could result in increased mobilisation of soil and increased surface water runoff (e.g. sediment laden "dirty" water) into the downstream receiving waters of Prospect Creek. This could also include pollutants (such as oil, hydraulic fluids and fuels) from spills or leaks from equipment. It is not anticipated that the Project would intercept groundwater and the construction of the Project would have a limited water demand. Water may be used during dust suppression and to mix concrete for use on site. Water and hydrology impacts arising from the construction of the Project are considered minimal due to the limited duration and intensity of construction activities. **Operation** Stormwater runoff from the Project would be collected and conveyed via existing pit and pipe drainage infrastructure. The stormwater management of the Project will align with the existing stormwater management strategy and treatment train for the SEF. The Project proposes to maintain the existing catchment areas and overland flow paths with no increase in the impervious area. Prior to discharge from the Project Site, all stormwater runoff will pass through the existing on-site detention tank. Given the existing conditions on-site, proposed Project operations and stormwater management strategy, the Project is not expected to have a significant impact on the water quality discharging from the Project Site. The design of the Project has the potential to impact flood conditions within and surrounding the Project Site due to changes in ground surface conditions. Flood modelling demonstrates that the modelled Project extent does not have a significant adverse impact on overland flow flood levels for the surrounding properties. **Mitigation measures** A Soil and Water Management Plan and Erosion and Sediment Control Plan (ESCP), or equivalent, would be incorporated into the CEMP. These plans would be developed and implemented in accordance with the principles and requirements of the *Landcom 2004 Managing Urban Stormwater: Soils and Construction – Volume 1* (commonly known as the 'Blue Book'). The ESCP will be progressively updated to reflect the changing nature of the Project site as construction activities progress. The Project will elevate infrastructure above flood levels in accordance with applicable industry standards and guidelines. For the batteries and electrical equipment these will be elevated above the 1% AEP flood level as a minimum. Sufficient safety measures would be incorporated into the design of the BESS facility, such as a Battery Management System and electrical protection systems which would include fault detection and shut-off functions to prevent any discharge of electrical current into flood waters.
Social Impact	An assessment of the potential construction and operational social impacts associated with the Project was undertaken by HillPDA (Chapter 13 and Appendix H).

Environment issue	Potential construction and operational impacts
	The Project Site is located in Smithfield within the Cumberland Local Government Area (LGA) and is predominantly surrounded by other industrial developments within the Smithfield Industrial Estate. There is limited social infrastructure in proximity to the Project Site Due to the limited duration of construction, the social impacts are anticipated to be minor. Temporary reductions in amenity and enjoyment of surroundings associated with the construction phase of the Project, which would likely be experienced by workers at neighbouring businesses. Once operational, there is a potential for minor negative social impacts to the surroundings, due to noise and safety risks to surrounding workers associated with the introduction of a BESS. However, these risks can be effectively mitigated through the implementation of measures during detailed design and operational procedures. Operation of the BESS may also result in the following positive social outcomes: • Economic benefits to the local region through workforce activity • Provide a reliable and secure source of electricity for the local region • Facilitate the introduction of a proven technology that has the potential to support renewable energy.
Economic Impact	An assessment of the potential construction and operational economic impacts associated with the Project was undertaken by HillPDA (Chapter 13 and Appendix I). Direct economic activity was reviewed based on IBIS World 2023 world reports and ABS Input Output tables. Indirect economic activity was estimated using Australian National Accounts Input Output tables 2020-21. The Project would have a direct impact on construction and operation output as well as stimulating other industries which assist in production. The Project will contribute to the employment of an additional employee at the SEF during operation which would support ongoing economic activity.
Waste Management	A desktop assessment was undertaken by Arcadis to identify the quantity and potential impact of the waste generated by the Project during construction and operation (Chapter 14). The construction and operation of the BESS would generate waste from a variety of sources and activities. **Construction** Waste generated through construction is likely to include construction waste (like packaging, scrap metal), excavated material, green waste, and recyclables from the construction compound. **Operation** Waste would be generated from battery replacement and maintenance, offices, amenities, lunchrooms, stormwater systems, and maintenance of plant and equipment. The Lithium-ion batteries are expected to be returned to the supplier or a suitably licenced processing facility for recycling, re-purposing or appropriate disposal at a licenced facility. **Mitigation measures** Waste will be managed where feasible, on the hierarchy of priorities for the efficient use of resources; which is consistent with the objectives of the *Waste Avoidance and Resource Recovery (WARR) Act 2001*. Measures to mitigate the effect of the construction waste streams would be incorporated into the Project's CEMP and OEMP and would include best practice waste avoidance and waste management where practicable. The waste impacts of the construction and operation of the Project are deemed to be minor and any impacts would be readily managed and reduced through the implementation of mitigation measures.
Visual Amenity	A desktop assessment was undertaken by Arcadis to identify the quantity and potential visual amenity impact of the Project during construction and operation (Chapter 15).

Environment issue	Potential construction and operational impacts
	The Project Site is located within an established industrial/power generation area. The closest residential dwellings are located on Chisholm Street approximately 400 m southeast of the Project Site. Five potential viewpoints were identified and photographs from each of these locations were taken during a site inspection. The visual impact of the Project at the five identified viewpoints was assessed against three criteria: visual sensitivity, magnitude and visual impact. **Construction** Visual impacts from the construction of the Project are likely to be low due to the temporary nature and industrial setting in which heavy vehicles and plant and equipment are used. **Operation** Given the size of the battery units, operation of the Project would generally be consistent with the visual built form and visual character of the SEF and is not anticipated to result in substantial visual impacts to the surrounding receivers. Night lighting for the BESS facility will be located at the Project Site for security purposes. Night lighting will be designed to ensure that there is minimal impact on surrounding receivers consistent with the night lighting standards.
Air Quality	A qualitative air quality impact assessment was undertaken to determine the potential air quality impacts associated with the construction, operation, decommissioning and rehabilitation of the Project (Chapter 16). **Construction** The Project Site generally comprises of sealed roads and hardstands, therefore fugitive dust emissions from construction would be considered negligible and can be appropriately managed with the implementation of a construction environmental management plan. Other emissions from construction vehicles, plant and equipment are considered negligible in the context of the industrialised nature of the surrounding area. **Operation** Operation of the BESS will not result in any emission of particulates or other pollutants. Staff movements are estimated to be up to five vehicles per day and would have a negligible impact on local air quality. **Mitigation measures** Reasonable and feasible dust suppression will be implemented during construction activities and incorporated as part of the CEMP.
Other Issues	An overview of other environmental matters for those environmental aspects that, based on existing information and assessment would not result in adverse impact and require limited mitigation is provided in Chapter 17. **Biodiversity** Construction of the Project would occur on land that is cleared of vegetation. No vegetation removal is proposed. Potential construction impacts to biodiversity may include the introduction and spread of noxious weeds and other invasive species and impacts to downstream waterways if construction water is not managed. A Biodiversity Development Assessment Report (BDAR) Waiver approval was granted as the development is not likely to have a significant impact on biodiversity values. The BDAR Waiver approval is attached in Appendix J. **Bushfire** Given the Project Site is located within an industrial area that has been highly disturbed and cleared of vegetation, and is not mapped as bushfire prone land, the risk of bushfires is considered low. **Heritage** The Project Site and immediate surrounds have been heavily disturbed due to the industrial nature of the surrounding land use. Therefore, it is considered highly unlikely that any heritage items would be

Environment issue	Potential construction and operational impacts
	uncovered during construction of the Project. Any unexpected finds would be managed by the standard unexpected finds protocol, which would be included in the CEMP.
Cumulative Impacts	The Project has been assessed in the context of the proposed and future developments in the surrounding area that may result in cumulative environmental impacts, specifically: • Smithfield Recycling Centre (State Significant Development Application) (SSD-19425495) Based on the nature of the Project (and these proposals), the key potential cumulative impacts identified was traffic and transport. Traffic modelling for the worst case scenario (construction of the Project, overlapping with operation of the Smithfield Recycling Centre) has been incorporated into the traffic model and is presented in Chapter 8 and Appendix C. Modelling results show there would be no change to the performance of the Cumberland Highway, Long Street, and Herbert Place intersection.

Justification and conclusion

The Project has been assessed in accordance with the *Environmental Planning and Assessment* Act *1979* (EP&A Act) and the Secretary's Environmental Assessment Requirement (SEARs). The Project satisfies the requirements of the SEARs (Appendix A) and is consistent with the principles of ecologically sustainable development (Chapter 20).

The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. The assessment concluded that no significant environmental impacts have been identified as a result of the Project. It is considered that any potential impacts can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Project has been assessed against, and has been found to be consistent with, the priorities and targets adopted in relevant published and draft State plans, as well as Government policies and strategies.

The Project is considered critical in supporting the NSW Government's electricity strategy for a reliable, affordable and sustainable electricity future that supports a growing economy. Overall, the EIS concludes that the Project is in the public interest and approval is recommended.

Next steps

The EIS will be placed on public display for a minimum 28 days in accordance with Schedule 1, Division 2 (Part 9, SSD applications) of the EP&A Act. This public display period would provide an opportunity for all stakeholders to comment on the Project. On completion of the public display period, all submissions received would be considered in a response to the Department of Planning and Environment.

Opportunities would also be provided for the community to provide feedback as well as for the dissemination of up-to-date information on the Project via an email feedback system, the Project website and enquiry lines with the Proponent (Smithfieldbattery@iberdrola.com.au).

1 Introduction

This chapter provides an overview of the Smithfield Battery Energy Storage System (the Project), Project background, Project location, Project objectives, and describes the Proponent. The chapter also outlines the structure of this Environmental Impact Statement (EIS).

1.1 Project overview

Smithfield BESS Pty Ltd as owned by Iberdrola Australia Limited (Iberdrola) (the Proponent) is seeking development consent for the construction, operation and maintenance of a large-scale Battery Energy Storage System (BESS) at the Smithfield Energy Facility (SEF) (Lot 33, DP850596) located at 6 Herbert Place, Smithfield NSW 2164 (the Project Site). The BESS would have a capacity of up to 72 Megawatts (MW) and up to 260 Megawatt-hours (MWh) of battery storage capacity (the Project).

The Project is considered to meet the definition of State Significant Development under Clause 2.6 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). The Project would be for electricity generating works on land that is permitted with development consent under Clause 2.35 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) and would have a capital investment value (CIV) greater than $30 million. The CIV of the Project is estimated to be $93 million.

The Proponent is seeking State Significant Development (SSD) approval for the Project under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Chapter 5 provides more information on the planning and assessment process for the Project.

The Project would involve construction and operation of the following:

- A BESS including battery enclosures, inverters, transformers, switch room and control room
- Medium voltage cables between the transformers and the existing switchgear building in the northeast corner of the SEF
- Switchgear building upgrades to facilitate connection of the BESS
- Site access to the BESS from Herbert Place
- Utilities to support operation of the BESS
- Stormwater management infrastructure, lighting, fencing and security.

The BESS would operate 24 hours a day, seven days a week. A detailed description of the Project is provided in Chapter 4 of this EIS and an overview of the project is shown in Figure 4-1.

1.1 Key terms

Table 1-1 provides a summary of the key terms used within this EIS.

Table 1-1: Key terms of the EIS

Terminology	Description
The Project	The Project for which approval is being sought, namely the construction, operation and maintenance of a BESS known as the "Smithfield Battery Energy Storage System". This includes the BESS facility, connection to the distribution network and ancillary elements.
Project Site	Where the Project would be located, which is at the Smithfield Energy Facility, at 6 Herbert Place, Smithfield NSW 2164 (Lot 33, DP850596).
Construction footprint	The extent of surface disturbance required to facilitate the construction of the Project.
Smithfield Energy Facility (SEF)	The power station owned and operated by Smithfield Power Generation Pty Ltd and located at 6 Herbert Place, Smithfield NSW 2164 (Lot 33, DP850596).
BESS facility	The extent where permanent project infrastructure will be established. The layout is currently indicative. This footprint would be finalised after the competitive tender procurement process and detailed design (pending Project approval). The BESS facility includes the following key elements: • Individual battery units or 'enclosures', generally consisting of a large fridge sized box or shipping container • Heating, ventilation and air conditioning (HVAC) units to provide ventilation and cooling airflow • Controls systems • Inverters, which convert direct current (DC) electricity from energy generating sources to alternating current (AC) mains power and vice versa • A transformer, allowing energy transfer to or from the grid • Switch room containing electrical switchgear • Control room to monitor and dispatch power.

1.2 The Proponent

The Proponent is Smithfield BESS Pty Ltd, a subsidiary of Iberdrola Australia Limited. Smithfield BESS Pty Ltd would own and be responsible for operation of the Project.

Iberdrola Australia Limited (ABN 39 105 051 616) are an owned entity of the Iberdrola Group. Iberdrola S.A. is the ultimate parent company of the entire Iberdrola Group and owns 100% of Iberdrola Australia Limited.

The Iberdrola Group is the number one producer of wind power by volume globally, and one of the world's largest electricity utilities by market capitalisation. Iberdrola Group's global expertise spans renewable energy, electricity networks, smart grids, large-scale energy storage, energy innovation and digitisation, and advanced customer products. The Iberdrola Group owns and operates 53 gigawatts (GW) of installed generating capacity, including over 40 GW of installed renewables capacity owned. They also have a further 7 GW of generating capacity contracted.

Iberdrola Australia Limited is a leader in renewable energy and has been operating renewable energy assets locally for over 15 years. Iberdrola Australia Limited is a long-term developer, operator and owner, and manages all aspects of the project lifecycle. It currently has a 1.4 GW portfolio of renewable assets under operation or construction in Australia, which is supported by 320 MW of firming capacity. Iberdrola has strong growth ambitions in supporting Australia in meeting its various clean energy targets and continue to provide reliable and affordable clean energy to its customers. It will be investing $2 billion in Australia by 2025.

The details of the Proponent are provided in Table 1-2.

Table 1-2: Proponent details

Proponent details	
Name	Iberdrola Australia Limited
Postal address	Governor Phillip Tower, Level 22, 1 Farrer Place, Sydney, NSW 2000
ABN	39 105 051 616
Nominated contact	Julien Tissandier Iberdrola Australia Limited
Contact details	julien.tissandier@iberdrola.com.au
EIS	Prepared by Arcadis Australia Pty Limited

1.2 Structure of this EIS

This EIS has been prepared by Arcadis Australia Pacific Pty Limited (Arcadis) on behalf of the Proponent to support an application for the approval of the Project. It has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued on 13 July 2023 by the Department of Planning and Environment (DPE), the EP&A Act and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The structure of the EIS is detailed in Table 1-3.

Table 1-3: Structure of this EIS

Section No.	Section title	Content
-	Executive summary	Provides a brief overview of the Project, key environmental assessment results and an outline of the proposed environmental and social mitigation measures.
1	Introduction	Provides an introduction of the Project and the EIS, including Project objectives, and Proponent details.
2	Site context	Provides a summary of the regional and local context.
3	Strategic context	Explains the strategic need for the Project, benefits, consistency with government plans, policies and guidelines, and outlines the alternatives considered during development of the Project.
4	Project description	Provides a detailed description of the Project. This includes a description of the Project area, the physical layout and design, uses and activities, and timing of the Project.
5	Statutory context	Provides the statutory context of the project, including an outline of the relevant legislation and environmental planning instruments applicable to the project.
6	Engagement	Discusses engagement undertaken with the community and outlines how the community engagement aims have been addressed, the key issues raised by the community, and the proposed future approach to community engagement. Engagement with the government agencies has also been addressed.
7	Environmental risk assessment	Provides an analysis of the likely environmental risks and assigns a rating before and after the implementation of mitigation measures.
8 to 18	Environmental assessment	Provides an assessment of environmental impacts during construction, operation, and decommissioning including: • Transport • Noise and vibration • Hazard and risk • Land and contamination • Water • Socio-economic • Waste • Visual • Other • Cumulative impacts Provides management measures to avoid or reduce impacts associated with the Project.
19	Environmental management	Provides an overview of the environmental management framework for the Project and includes a compilation of the management measures identified throughout the environmental assessment.

Section No.	Section title	Content
20	Ecologically sustainable development	As required under the SEARs, this section outlines how the Project is consistent with the principles of ecologically sustainable development (ESD)
21	Justification and conclusion	Provides an overview of the conclusions from the environmental impact assessment and discusses the project's justification on balance of environmental, social and economic considerations, including ESD.
22	References	Provides a list of references used throughout the EIS.

The following Appendices are included in the EIS.

Table 1-4: Appendices

Appendix	Description	Author
A	Consolidated SEARs compliance table	Arcadis
B	EP&A Regulation checklist	Arcadis
C	Traffic Impact Assessment	Arcadis
D	Noise and Vibration Assessment	Benbow Environmental
E	Preliminary Hazard Analysis	Sherpa Consulting
F	Preliminary Site Investigation	Arcadis
G	Water Impact Assessment	Arcadis
H	Social Impact Assessment	Hill PDA
I	Economic Impact Assessment	Hill PDA
J	BDAR Waiver Approval	DPE

2 Site Context

This chapter provides an overview of the Project Site setting and its regional, local and approval context.

2.1 Regional context

The Project is located at the SEF (Lot 33, DP850596) at 6 Herbert Place, Smithfield NSW 2164 (the Project Site). The Project Site is within the Cumberland Local Government Area (LGA) in Western Sydney, around 30 kilometres west of the Sydney Central Business District (CBD). The Project Site is located 580 metres east of the Guildford substation. The Project is located within the Prospect Creek catchment with Prospect Creek located 330 metres downstream to the south of the Project Site. From this location, Prospect Creek continues to drain southeast to Georges River and Botany Bay.

The Project Site forms part of the broader Smithfield-Wetherill Park Industrial Estate, renowned for its manufacturing and distribution industry. The industrial estate accommodates almost 3,000 businesses and provides employment to approximately 20,000 people. It is strategically connected to national and international transport networks, including the M7 and M4 motorways and the new Western Sydney Airport.

The Smithfield region falls within the highly urbanised Prospect Creek catchment, a sub-catchment of the larger Georges River Catchment. The region is characterised by industrial and residential land uses, with residential areas being more prevalent in the suburbs surrounding Smithfield.

2.2 Local context

The Project Site is located within an existing industrial area, known as the Smithfield Recycling and Manufacturing Precinct, and is accessed via Herbert Place, a 40 km/hr dual lane local road. The Project Site is bounded to the south, west and east by the Visy Smithfield Recycling Facility (Visy site), a paper and plastics sorting and recycling facility. Kingspan Insulation is located to the north and includes a large carparking area and a warehouse used for assembly, service and storage of retail and commercial water tanks.

The nearest residential receivers to the Project Site are located in the suburbs of Smithfield and Guildford West. The nearest residential receiver is located around 400 metres south of the Project Site.

A summary of nearest receivers by direction is included in Table 2-1.

Table 2-1: Nearest sensitive receivers (by direction)

Direction	Receiver ID	Receiver type	Location	Distance (m)
S	R15	Industrial	6 Herbert Place, Smithfield	60
N	R13	Industrial	3 Herbert Place, Smithfield	120
W	R12	Industrial	2 Herbert Place, Smithfield	140
NE	R16	Other	Calvary Church	230
SE	R14	Industrial	6 Herbert Place, Smithfield / 158-160 McCredie Road, Smithfield	270
S	R4	Residential	31 Chisholm Street, Smithfield	400
SW	R2	Residential	12 Kiola Street, Smithfield	400
SW	R1	Residential	6 Low Street, Smithfield	400

Direction	Receiver ID	Receiver type	Location	Distance (m)
SSE	R5	Residential	44 Solo Crescent, Smithfield	400
SSW	R3	Residential	20 Vineyard Avenue, Smithfield	430
SE	R6	Residential	124 Granville Street, Fairfield	530
S	R17	Other	Minh Giac Temple	670
S	R18	Other	Assembly Church	690
ENE	R8	Residential	127 McCredie Road, Guilford West	790
NE	R9	Residential	79 Warren Road, Woodpark	920
E	R7	Residential	126 Fairfield Road, Guilford West	1,010
NNW	R10	Residential	9 Magnolia Street, Greystanes	1,370
WNW	R11	Residential	17 Rhondda Street, Smithfield	1,630

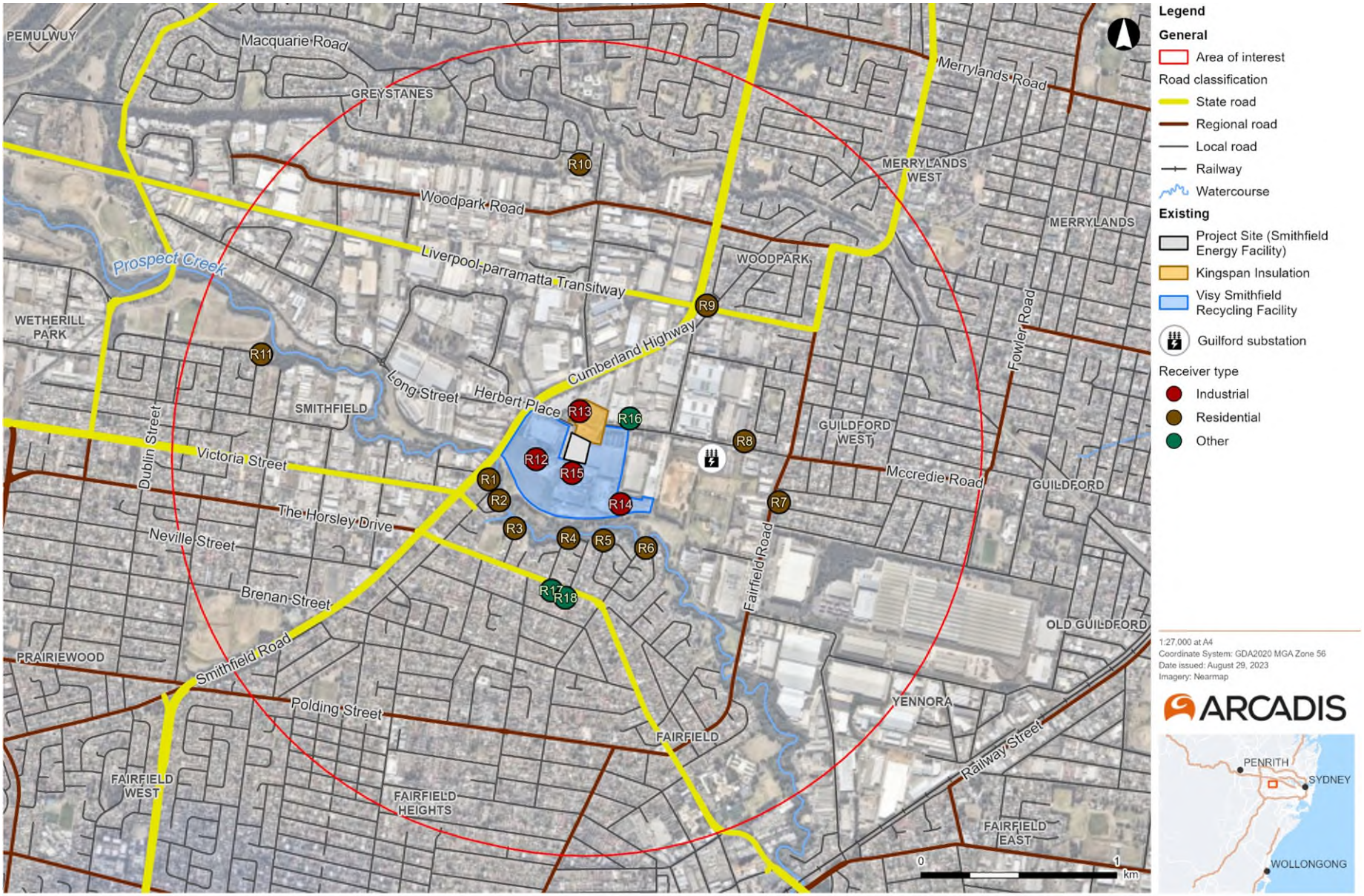


Figure 2-1: Local context

2.3 Smithfield Energy Facility

The SEF currently operates under an existing Ministerial consent (DA 94/165) granted by the then Minister for Planning and holds Environmental Protection Licence (EPL) 5701 for the scheduled activity of electricity generation.

The SEF is owned and operated by Smithfield Power Generation Pty Ltd on land leased from Visy Industries Pty Ltd (Visy). The SEF has been in operation since 1996 and was originally designed and operated as a Combined Cycle Gas Turbine (CCGT or cogeneration) power plant, supplying both electricity to the NSW electricity grid and heat in the form of steam to the adjacent Visy site. Since 2017, the SEF has operated as an Open Cycle Gas Turbine (OCGT or peaking plant) supplying electricity to the NSW electricity grid during periods of peak demand and no longer supplies steam to the adjacent Visy site.

The SEF uses natural gas as a fuel source and consists of three power trains, which is a type of power station unit comprising a 38 megawatt (MW) gas turbine to generate electricity (see Figure 2-2). In recent years, the SEF has operated between 2% and 5% of the time each year with five staff onsite.

Key features of the SEF are shown in Figure 2-2 and include:

- Power trains which comprise gas turbines, heat recovery generators and exhaust gas stacks
- Cooling towers
- Steam turbine generator
- Electrical switch room
- Water storage tank
- Stormwater infrastructure
- Internal access roads and car parking of up to 20 light vehicles
- Fencing, lighting and security
- Site office
- Noise walls.

As part of a separate application (DA94/165-MOD3), Iberdrola is proposing to optimise the SEF. These works are shown in Figure 2-3 and include:

- Removal of some redundant CCGT infrastructure
- Construction and operation of a new cooling system
- Removing the ability for the SEF to operate in OCGT mode.

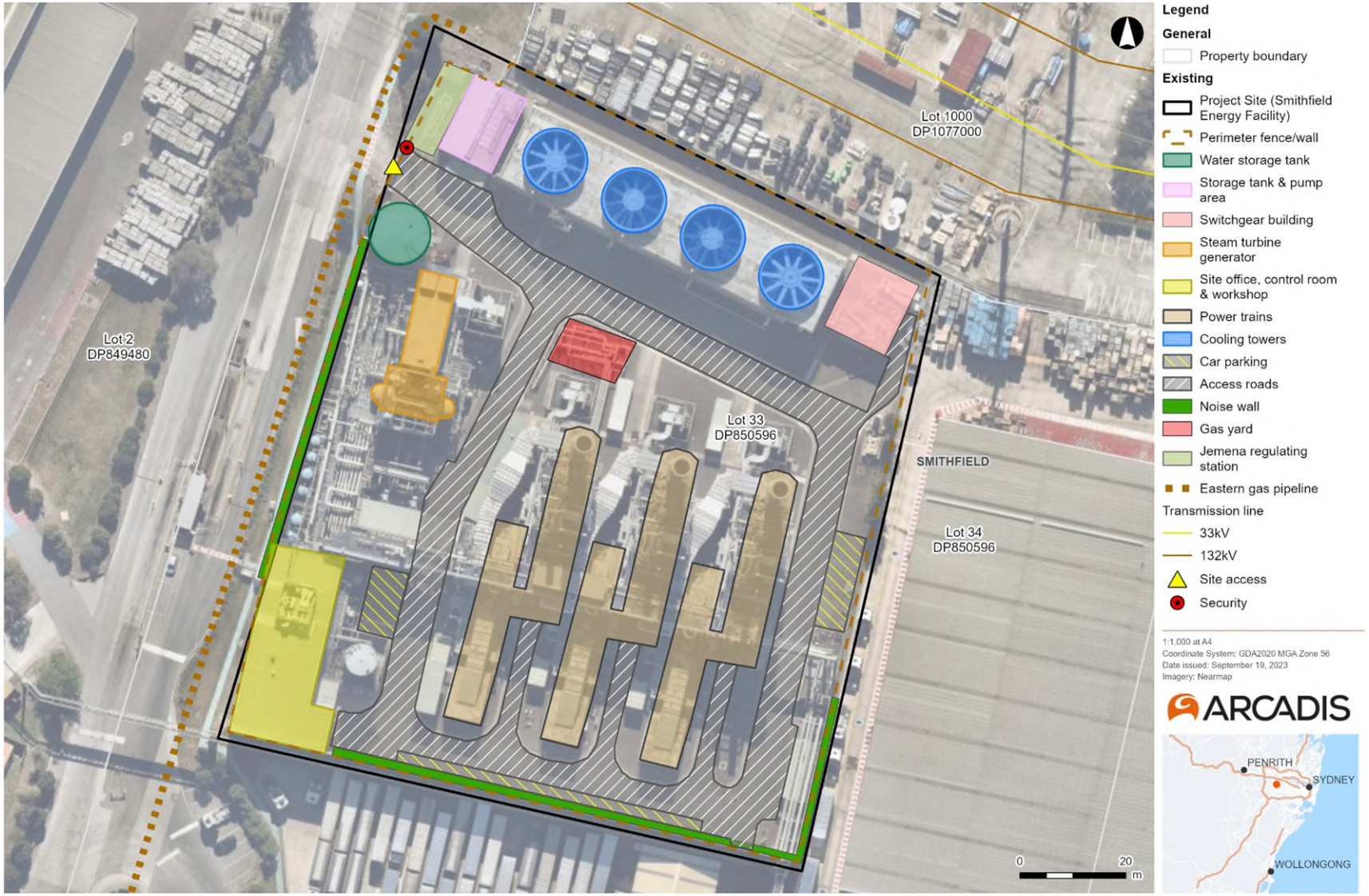


Figure 2-2: Existing features of the SEF

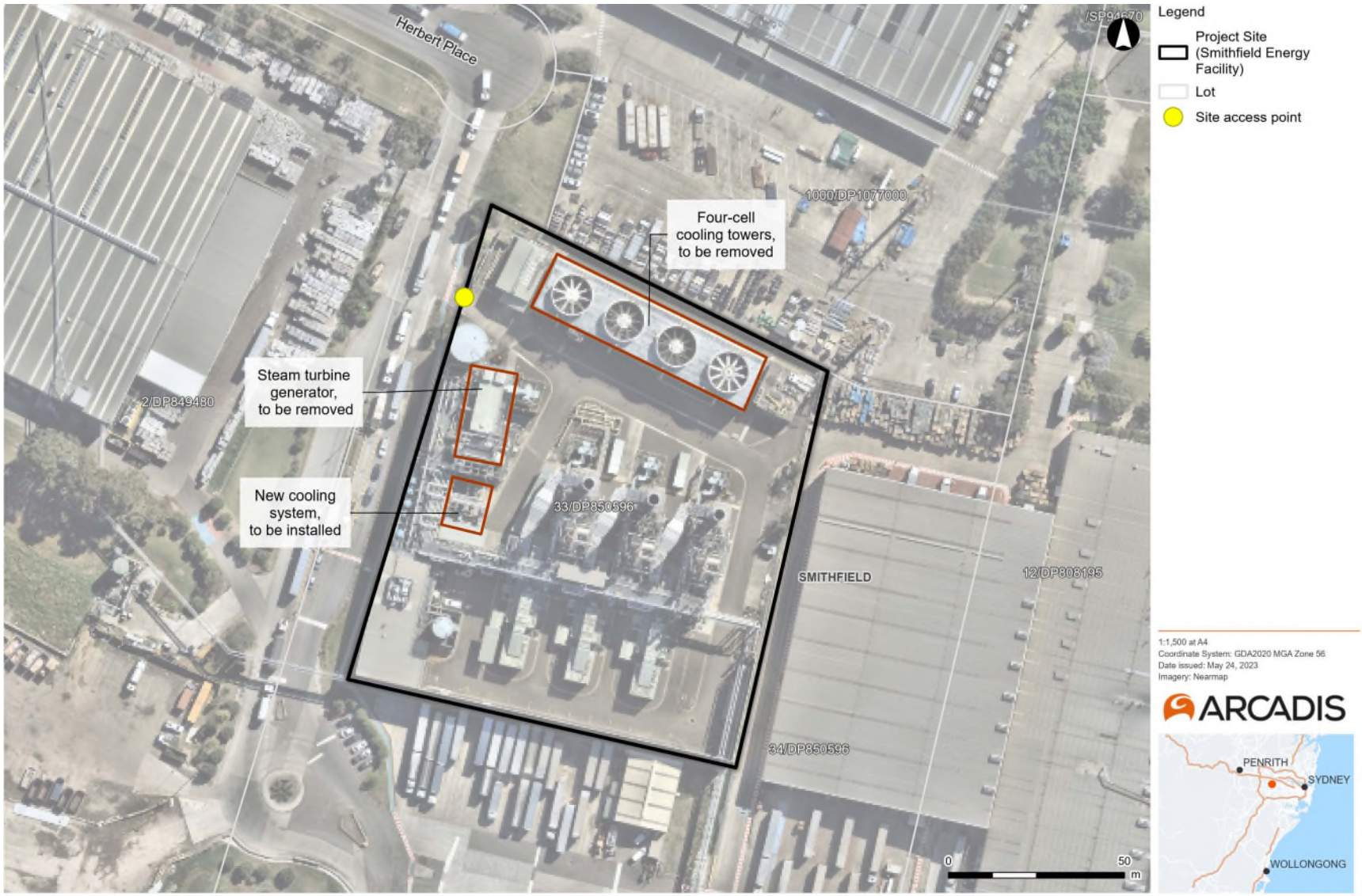


Figure 2-3: Modification overview (subject to approval of DA94/165-MOD3)

2.4 Approval context

An overview of the existing approval and subsequent modifications at the SEF is provided in Table 2-2. The SEF holds Environmental Protection Licence (EPL) 5701 for the scheduled activity of electricity generation. The SEF would continue to operate in accordance with EPL 5701.

This Project, whilst located at the SEF, is a separate standalone development. Further information regarding the statutory context of the Project is provided in Section 5.

Table 2-2: SEF Approvals

Approval	Mechanism	Date of approval	Description
DA 94/165	Development consent was granted by the then Minister for Planning	18 November 1994	Development of a natural gas cogeneration power plant (construction and operation of a cogeneration plant, consisting of three gas turbines, three heat recovery steam generators, a single steam turbine and associated infrastructure).
DA 94/165-Mod-1	Section 96(1A) modification	9 May 2006	Removed requirements for meteorological and ambient air quality monitoring.
DA 94/165-Mod-2	Section 75W modification	24 August 2017	To allow the facility to be used intermittently in open cycle mode in addition to operating the facility in cogeneration mode.

3 Strategic Context

This chapter explains the strategic need for the Project, consistency with government plans, policies and guidelines, and outlines the alternatives considered during development of the Project.

3.1 Project objectives

The objectives of the Project are to:

- Increase firming infrastructure and the potential for additional renewable energy assets to be built in NSW
- Improve the security, resilience and sustainability of NSW's electricity grid
- Help reduce the direct carbon emission of the NSW's electricity grid (by not relying on traditional fossil fuel firming assets)
- Minimise adverse impacts on the environment and community during construction and operation.

3.2 Project need and strategic justification

The Project is needed to support the NSW Government's strategy for a reliable, affordable and sustainable electricity future that supports a growing economy. The National Energy Market (NEM) is rapidly moving away from reliance on thermal generation facilities towards renewable energy generators. Grid-scale battery energy storage is essential in providing infrastructure enabling the expansion of renewable energy in NSW and in ensuring firm capacity is met. As such, the Proponent considers that the Project will play a role in the transformation of the NSW energy sector.

The Federal, State and Local Governments have put in place several plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. These include:

- *2020 Australia's Long Term Emissions Reduction Plan* (DCCEW, 2021)
- *2022 Integrated System Plan for the National Electricity Market* (2022 ISP) (Australian Energy Market Operator (AEMO), 2020)
- *NSW Transmission Infrastructure Strategy* (Department of Planning, Industry and Environment (DPIE), 2018) (the Transmission Infrastructure Strategy)
- *NSW Government's Electricity Strategy* (DPIE, 2019) (the Electricity Strategy)
- *NSW Electricity Infrastructure Roadmap* (DPIE, 2020) (Electricity Infrastructure Roadmap)
- *NSW Climate Change Policy Framework* (NSW Office of Environment and Heritage (OEH), 2016).

A high-level overview of each of these plans, strategies and roadmaps is provided below.

3.2.1 2020 Australia's Long Term Emissions Reduction Plan (National)

Australia's whole-of-economy Long-Term Emissions Reduction Plan is focussed on technology and sets out how Australia will achieve net zero emissions by 2050. One of the key principles of the plan is keeping energy prices down, while providing affordable and reliable power. The plan identifies low emissions technology solutions, including energy storage for firming, as a priority technology to achieving clean, cheap electricity.

The Technology Investment Roadmap is the cornerstone of the Long-Term Emissions Reduction Plan and sets a process to develop and deploy low emissions technologies. The Technology Investment Roadmap requires the preparation of Low Emissions Technology Statements (LETS) which review, refine and evaluate the government's investments in low

emissions technologies. The current LETS (LETS 2021) identifies energy storage as an existing priority technology for government investment.

LETS 2021 indicates that broad deployment of electrical energy storage will facilitate further integration of low-cost solar and wind electricity into the grid. Energy storage will provide system security services, be a source of reliable, dispatchable electricity, and will reduce pressure on electricity prices by meeting peaks in consumer demand.

The Project would be consistent with the high priority technologies outlined in the Long-Term Emissions Reduction Plan as it which would provide increased transmission capacity and a reliable source of power at affordable prices for customers.

3.2.2 2022 Integrated System Plan

The 2022 ISP (AEMO, 2022) provides a comprehensive roadmap for the NEM by supporting a once-in-a-century transformation in the way electricity is generated and consumed in eastern and south-eastern Australia.

The 2022 ISP and its optimal development path support Australia's complex and rapid energy transformation towards net zero emissions, enabling low-cost firmed renewable energy and essential transmission to provide consumers in the NEM with reliable, secure and affordable power.

Development opportunities for an optimal energy system identified in 2022 ISP acknowledges that to firm up the inherently variable nature of distributed and large-scale renewable energy generation, new flexible, dispatchable resources, including BESS (as proposed by the Proponent), will be needed.

New utility-scale battery and pumped hydro storage, located at appropriate parts of the network, will enable more effective dispatch of clean electricity on demand, increase resilience by shifting energy through time to manage weather variations, and provide critical system security services.

As the Project would primarily involve the development of a BESS system that connects to existing power supply transmission networks, it is considered to align with, and support the intent of, the 2022 ISP.

3.2.3 NSW Transmission Infrastructure Strategy

The Transmission Infrastructure Strategy (DPIE, 2018) acknowledges that NSW is undergoing an energy sector transformation which will change how energy is generated and used throughout the State.

The Transmission Infrastructure Strategy forms part of the NSW Government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure and ensure new technologies deliver benefits for customers.

By increasing transmission capacity and low-cost generation, the strategy aims to support an orderly transition of the energy sector over the next two decades.

As the Project would primarily involve the development of a large-scale BESS system that connects to existing power supply transmission networks, it is considered to complement the Transmission Infrastructure Strategy.

3.2.4 NSW Electricity Strategy

The Electricity Strategy (DPIE, 2019) is the NSW Government's Plan for a reliable, affordable and sustainable electricity future. The Electricity Strategy acknowledges the challenges that exist in achieving the Government's objectives for the electricity system. This includes reliability risks from the retirement of some traditional coal-fired power stations combined with congestion within the existing transmission system. Both these risks reduce the attractiveness of

investment in the new generation required to reduce electricity prices, improve reliability, and protect the environment.

The Electricity Strategy sets out actions to address the specific needs of NSW while long term national reforms are developed and implemented. Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, i.e. firm generation (such as gas and battery storage) dispatch electricity into the grid. This energy generation and supply system can satisfy electrical demand so long as there is sufficient firm generation capacity to meet the system's electricity demand.

As noted in the Electricity Strategy, as at October 2019, there are 17,700 MW of large-scale renewable energy projects that have received planning approval or are progressing through the NSW planning system, representing about $24 billion in investment. In addition to these renewable projects, there are 1,410 MW of large-scale non-renewable energy projects with planning approval, worth around $1.5 billion. This includes 1,250 MW of gas projects, worth $1.25 billion, and 160 MW of coal efficiency upgrades, worth $209 million.

Batteries, as a form of electrical storage, also provide multiple grid services such as frequency regulation. The cost of batteries has fallen in recent years and is expected to continue to trend downwards making batteries a more feasible, commercial firming option for wind and solar farms. The principles guiding the development of the Electricity Strategy comprise four propositions. *Principle 1: New generation, delivered by competitive markets should reduce electricity prices and protect the environment*, notes that renewables, firmed by dispatchable technologies such as gas and storage, are the lowest cost form of new reliable electricity generation. Accordingly, a good investment environment will deliver new generation, reduce electricity prices, and ensure reliability while protecting the environment.

The Project is consistent with the goals of the Electricity Strategy, given the Project's ability to provide firm generation infrastructure able to support and complement future development of renewable energy projects.

3.2.5 NSW Electricity Infrastructure Roadmap

The Electricity Infrastructure Roadmap (DPIE, 2020) recognises that NSW has some of the best renewable energy resources in the world and as the global economy moves to reduce carbon emissions, NSW can attract investment in new, low carbon industries and can benefit from some of the lowest electricity prices in the Organisation for Economic Co-operation and Development. The Electricity Infrastructure Roadmap also acknowledges that to take advantage of these opportunities, substantial investment into modernising the existing electricity system, including by building transmission, generation and long duration storage and firming infrastructure is required.

The purpose of the Electricity Infrastructure Roadmap is to deliver this infrastructure and secure NSW's future as an energy superpower. The roadmap is expected to attract $32 billion of timely and coordinated private sector investment in large-scale generation, storage and transmission by 2030 to maintain a reliable, secure and affordable supply.

The Electricity Infrastructure Roadmap notes that investment in large-scale storage and firming capacity, including battery storage (long and short duration) will be required to balance the supply of variable renewable energy.

Recently, as a part of the NSW Electricity Infrastructure Roadmap, the Consumer Trustee (AEMO Services) commenced a competitive tender for firming infrastructure which aligns with the Consumer Trustee's 10 Year Tender Plan for built energy infrastructure in NSW released in its 2022 Infrastructure Investment Objectives Report. This competitive tender round is for an indicative amount of 380 MW of firming infrastructure.

3.2.6 NSW Climate Change Policy Framework

The aim of the NSW Climate Change Policy Framework (OEH, 2016) is to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change.

The long-term objective of the Climate Change Policy Framework is:

- To achieve net-zero emissions by 2050
- That NSW is more resilient to a changing climate.

As the Project would include the provision of a BESS facility that would assist in the development of a renewable energy power supply network for NSW that would increase capacity and resilience, the Project is considered complementary to the NSW Climate Change Policy Framework.

3.3 Summary of Project need

As detailed in Section 3.2.3, NSW is undergoing an energy sector transformation which will change how energy is generated and used throughout the State. The need to increase the generation of renewable energy as many of the State's largest coal-fired power stations begin to close has been identified.

Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand i.e. firm generation (such as gas and battery storage) dispatch electricity into the grid. This energy generation and supply system can satisfy electrical demand so long as there is sufficient firm generation capacity to meet the system's electricity demand.

Without the development and operation of short and long-term dispatch infrastructure to support increasing investment, there is the potential for future deficit in capacity and reliability of the NSW power supply system. In a worst-case scenario, this can lead to load shedding or blackout events.

BESS facilities, such as that proposed by the Project, would provide short duration storage, frequency control ancillary services (FCAS) (to provide a fast injection of energy, to manage supply and demand) and help firm variable renewable energy generation.

3.3.1 How does a BESS work?

Batteries are an energy storage technology designed to absorb and release electrical energy on demand. Lithium-ion is the most common battery chemistry used to store electricity and when a large number of batteries are installed together (i.e. grid-scale or large-scale battery storage (LSBS)) they can act as large-scale power generators when connected into the electricity distribution network. The Project proposes the development of a lithium-ion BESS capable of discharging up to 72 MW as required to meet demand during peak periods.

Unlike many other forms of energy storage and generation, batteries are particularly valuable because they provide flexibility. They can respond faster than other energy storage or generation technologies and help maintain grid stability by providing the necessary response in fractions of a second.

The BESS would comprise modular units on pad mounted foundations, which are containerised. Each unit contains a number of battery pods strung together and connected to an inverter, which will convert the direct current (DC) from the batteries into alternating current (AC) and connect into the electricity grid.

The battery technology type and layout for the Project would be refined during the detailed design process. An operational BESS example is provided in Figure 3-1.

Figure 3-1: Example of a BESS (Lake Bonney Wind Farm)

3.4 Strategic alternatives

3.4.1 'Do nothing'

The do-nothing approach would not support the NSW Government's broader plans and strategies to make energy more affordable, secure investment in new power sources and network infrastructure and ensure new technologies deliver benefits for customers.

For these reasons, the 'do nothing' scenario is not the preferred or considered a suitable option.

3.4.2 Build the Project at the Project Site

Building a BESS at the SEF would provide for future capacity and resilience of the NSW energy network through the delivery of a large-scale dispatchable energy storage system. The Project would utilise the existing distribution network (i.e., existing switchgear building and nearby Guildford substation) as part of the development, thereby minimising the need for additional upgrades or works required to connect to the grid.

Building a large-scale BESS is expected to contribute to the reduction in the cost of supplying electricity to consumers in NSW, thereby supporting the goals and objectives of the electricity generation, supply and transmission policies in NSW.

3.4.3 Alternative technology

Lithium-ion BESS technology is established in the marketplace and is already required to comply with a range of Australian and international standards. The hazards associated with each type of battery chemistry technologies

available are similar as they are all Lithium Iron Phosphate (LFP) based technology. The proposed temperature control, voltage control, monitoring systems and fire management systems are best practice.

While other battery technology exists, LFP battery technology is currently selected as the preferred option based on the following criteria:

- Minimal risk of thermal runaway
- Safety, fire management and containment
- Ability to support the network to increase renewable energy penetration
- Ability to provide energy during periods of peak demands
- Minimal environmental impact
- Safety and ease of integration
- Demonstration and maturity of technology
- Value for money.

The battery technology type and layout for the Project would be refined during the detailed design process.

3.5 Project Site selection criteria and refinement

The Proponent completed a site selection exercise which reviewed potential BESS development opportunities within NSW. Several site selection criteria were applied, including:

- Land use zoning and development permissibility
- Existing grid infrastructure
- Availability of access to the site via a major road
- Provision of an area that would avoid and/or minimise the need to remove high quality native vegetation
- A flat site that would require minimal excavation and/or levelling
- An area that would not adversely result in flooding impacts
- An area that is not located within bushfire prone land
- Minimising impact on surrounding privately or publicly owned land
- Minimal environmental impacts.

The SEF was considered as a suitable location for a BESS Project given the Project Site's high rating against each of the criteria listed above, compatibility of a BESS with the site's existing land use zoning and permissibility and outcomes of early consultation with Visy regarding footprint availability. Additionally, by locating the BESS project within the SEF, the Project would be co-located with existing energy dispatch (i.e. the SEF) and other operational (i.e. water supply, security etc) infrastructure.

Alternative sites within and near the SEF were also considered through this site selection exercise. The key limiting factors to an alternative site were identified as being potential increased costs and environmental impacts associated with the acquisition of a suitable property and the increased extent of connecting infrastructure between the BESS and Guildford substation.

Consideration was given to the neighbouring vacant land within the Visy site (Figure 2-1), however following consultation with Visy, this vacant land was identified as being needed for future Visy operations. As such, at this time, no suitable alternative sites have been identified.

4 Project Description

This chapter provides a description of the Project including design, construction, operation and decommissioning. The Project has been designed to ensure potential impacts to the environment are minimised.

4.1 Project overview

The Smithfield BESS Project involves the construction and operation of a grid-scale battery. The Project is forecasted to use lithium-ion batteries and with a generation capacity of up to 72 MW / 260 MWh.

This Project would include the following key built form features:

- A BESS facility including battery enclosures, inverters, transformers, switch room and control room
- Medium voltage cables between the transformers and the existing switchgear building in the northeast corner of the SEF
- Switchgear building upgrades to facilitate connection of the BESS
- Site access to the BESS from Herbert Place
- Utilities to support operation of the BESS
- Stormwater management infrastructure, lighting, fencing and security.

A summary of the key project components and functionality is provided in Table 4-1.

Table 4-1: Project overview specifications

Project Component	Details
Site details	
Application lots	• Lot 33, DP850596
Zoning	• IN1 – General Industrial
Project Site area	• Project Site 1.4 ha of which the BESS facility is 0.3 ha
Access	• Access to the Project Site would be from the existing access point on Herbert Place via the Cumberland Highway
Project design and built form	
BESS capacity	• Up to 72 MW active power • Up to 260 MWh battery storage capacity
BESS facility	• Pre-assembled battery enclosures housing lithium-ion type battery cells, associated control systems and HVAC (heating, ventilation and air conditioning) units • Inverters • Transformers • Electrical switch gear • Switch room • Control room including telecommunications, controls, supervisory control and data acquisition (SCADA) and power monitoring equipment

Project Component	Details
Switchgear building and distribution network	• The BESS facility would connect to the existing switchgear building via a 33 kV switch room and associated underground medium voltage cables • Minor upgrade to the existing SEF electrical switchgear building • An existing connection between the existing switchgear building and nearby Guildford substation would be utilised as part of the development. No upgrades or works are required to the distribution network.
Ancillary elements	• Signage at site entrance and within the Project Site for the purposes of way finding, safety and building identification • Integrated telecommunication system • Utility services connections • Utilisation of existing SEF infrastructure, including: - Stormwater drainage and management measures - Site entrance and security - Perimeter fencing and noise walls - Water storage tank / existing Sydney Water hydrant - Car parking - Site office - Lighting.
Design elements subject to change during detailed design	Detailed design for the project has yet to be completed. The following design elements may be amended throughout the detailed design process: • Layout of the BESS units and selection of battery supplier • Location of a construction site compound / laydown area within or directly adjacent to the existing SEF • Works at the SEF to facilitate connection of the BESS • Where required the existing drainage infrastructure will be modified to accommodate the Project infrastructure, both above and below ground level. Additional stormwater collection pits and drainage pipes may be required.
Construction	
Capital investment value	• $93 million
Construction footprint	• 2.06 ha (the actual footprint would be much smaller as this is based on all the potential compound options shown in Figure 4-6)
Activities	Construction of the Project is expected to comprise: • Site establishment • Preparation at ground level to accommodate the installation of footings for the BESS • Delivery, installation and fit out of the BESS, including design mitigation elements • Construction of ancillary elements • Installation of permanent fencing for the BESS. It is assumed that the existing security systems would be upgraded to include the BESS • Testing and commissioning • Removal of construction equipment and materials and rehabilitation of construction and laydown areas (where applicable).

Project Component	Details
Program	• Expected commencement of construction of the BESS in Quarter 3 of 2024 and would continue for approximately 12 months.
Hours	• Standard working hours: - 7am to 6pm Monday to Friday - 8am to 1pm Saturdays - No works on Sundays or public holidays. • Some work outside of these hours (e.g., oversize deliveries, emergencies) as required.
Workforce	• Up to approximately 30 full-time equivalents will be required for construction during the project peak • The operation of the project will be staffed by one to four maintenance personnel on a scheduled basis.
Vehicle movements	• The following maximum vehicle movements are predicted (subject to detailed design): - Up to 30 passenger vehicles per day (30 in and 30 out) during the construction works phase - Up to 20 heavy vehicles per day (20 in and 20 out) during the construction works phase - Oversize overmass (OSOM) vehicles during the construction works phase. This is subject to detailed construction planning and is anticipated to be minimal. • Average daily heavy vehicle movements during the construction phase will generally be significantly lower than outlined above as the delivery of BESS enclosures is anticipated to occur in batches.
Transport	• It is anticipated that the majority of the BESS infrastructure (e.g. BESS modules, inverters etc) and transformers would be procured offshore, and Port Botany would be the preferred port of entry • Construction materials would be sourced from nearby concrete suppliers (such as Boral Concrete located on Long Street) and hard rock quarries where practical • Construction labour, equipment and plant will likely be sourced from within the Sydney region.
Water	• Water used directly on site for construction would predominantly relate to dust suppression. • Water would be sourced from the municipal water supply (in agreement with the relevant authority).
Operation	
Life of BESS	• The estimated life of the initial BESS equipment is 15-20 years • At the end of operational life, this may be extended subject to the replacement of components and market conditions.
Workforce	• The BESS would be operated remotely with a scheduled maintenance and inspection program • The existing workforce at the SEF would be available to manage the BESS (currently five staff onsite) as required.
Operational hours	• 24 hours, 7 days a week
Vehicle movements	• Vehicle movements to and from the Project Site would occur infrequently during operations, primarily for scheduled maintenance.

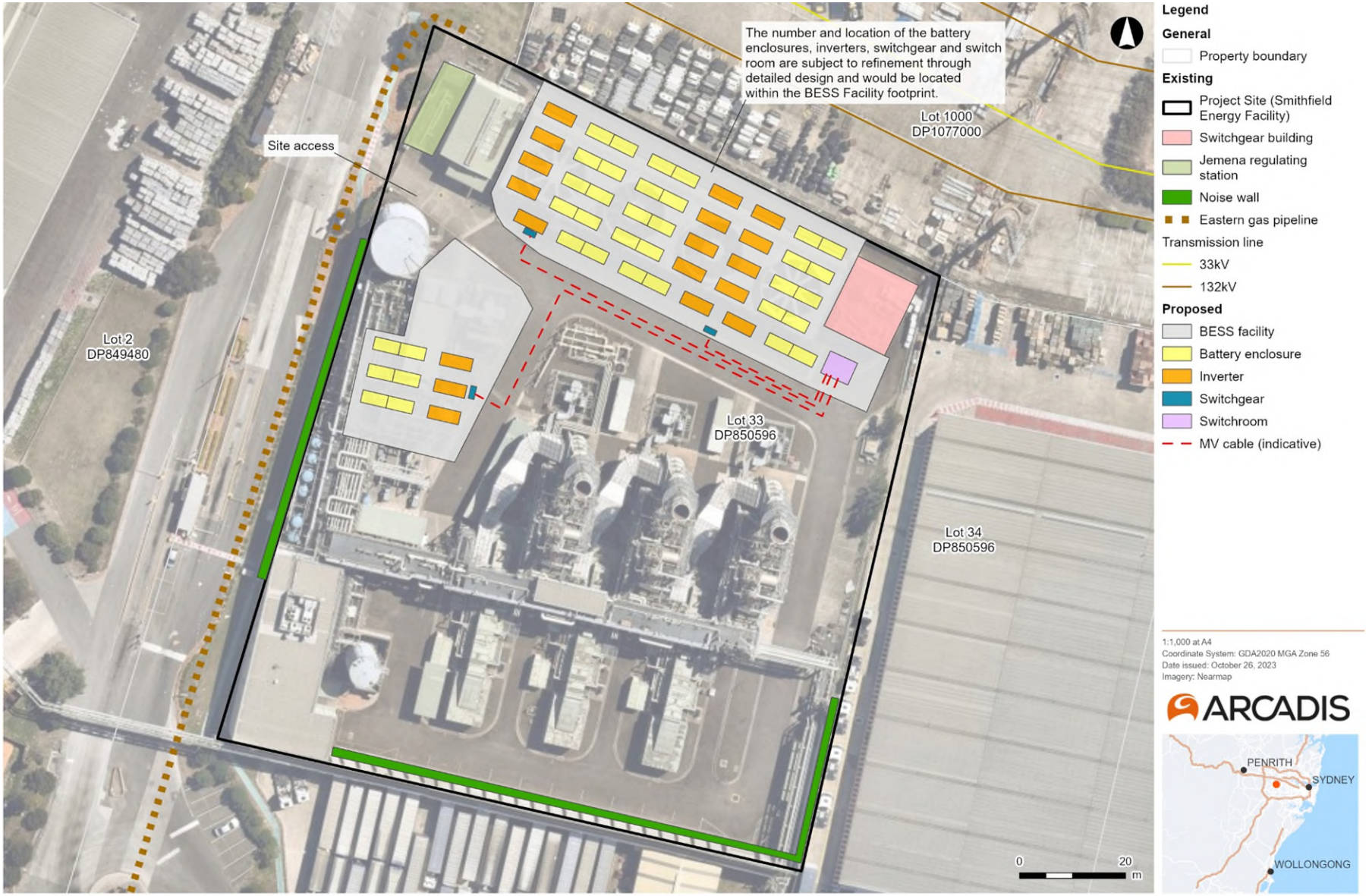


Figure 4-1: Operational overview of the Project

4.2 Project design and built form

4.2.1 BESS facility

An indicative overview of the Project is shown in Figure 4-1. The number and location of the battery enclosures, inverters, switchgear, switch room and control room are subject to refinement through detailed design. It would be subject to commercial tendering and procurement processes and would ensure the Project is optimised in terms of yield and efficiency, within the parameters of the approval. Submission of the final detailed design to DPE prior to construction is a standard feature of approved SSD consent conditions. This provides the final check that the detailed design is consistent with the EIS's assumptions.

As the final specifications and location of infrastructure are subject to change during detailed design, where required in this section, upper limit quantities and power level estimates are provided to ensure the assessment and any subsequent approval maintains the flexibility required in the detailed design stage, post approval.

Similarly, while an indicative design is provided to provide a clearer understanding of what would be constructed, the delineation of the BESS facility footprint provides the assessment and flexibility to minor layout changes in the final design. Together this 'upper limit' or 'worst case' approach ensures that all impacts of construction, as well as operation and decommissioning are captured in the environmental assessment section of this EIS and that any recommendations and mitigation strategies would be appropriate to the final detailed design.

Each battery unit would contain a group of lithium-iron-phosphate batteries, housed within weather-proof enclosures. The BESS would also contain inverters, transformers, switchgear, and associated control systems. The batteries and inverters have ventilating and air conditioning systems that maintain the equipment within safe operational temperature limits. An example of a battery module is provided in Figure 4-2.

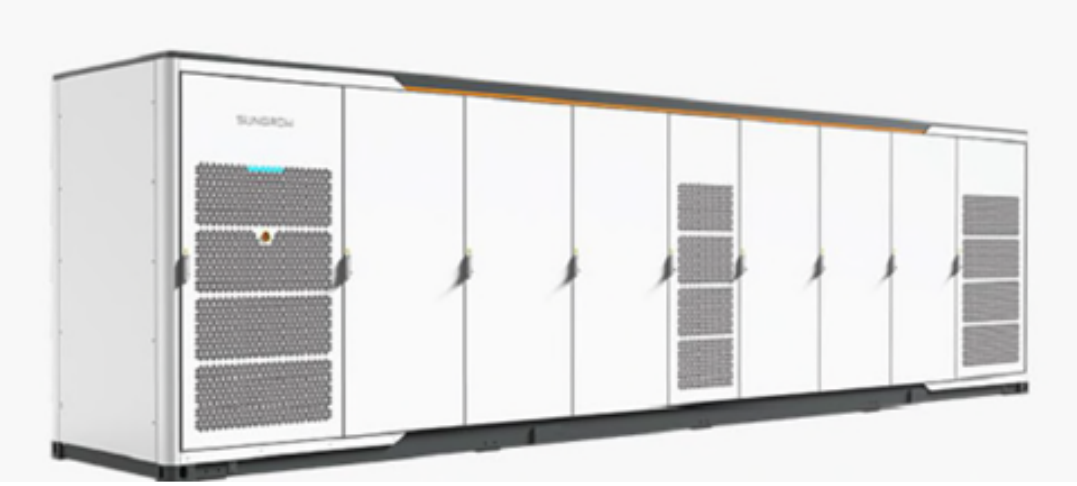


Figure 4-2: Example module of BESS unit

The size of the individual battery units would be dependent on the selected supplier. Typical BESS model dimensions are provided in Table 4-2.

Table 4-2: Typical BESS model dimensions

OEM	Dimensions (w, d, h) (mm)
Wartsila	3169 x 2076 x 2462
CATL	6058 x 2462 x 2896
Tesla	8800 x 1650 x 2785
Sungrow	9340 x 2600 x 1730
Energy Vault	9990 x 2440 x 2930
Powin	12192 x 2438 x 2896

Each battery unit would be mounted on concrete footings, built foundations, plinths or piles. The layout and spacing would be designed in accordance with appropriate standards to ensure integrity of the system. The battery units would be connected via underground cables to a control room. The control room would provide a range of safety measures including:

- Maintaining voltage levels and ensuring automatic cut-out in the event of electrical shorts.
- Preventing overcharging and current surges.
- Preventing overheating or other unplanned events.

The BESS would use equipment that has been tested for fire safety and fire protection systems and would be installed according to suppliers' recommendations and the Fire Safety Study.

Additionally, fire water would be available on site (through the existing Sydney Water hydrant and / or SEF water tank) to protect against fire propagation. Detailed design would consider fire water reticulation for the BESS facility. All fire safety systems would be detailed in a Fire Safety Study prepared in consultation with Fire and Rescue NSW (FRNSW).

4.2.2 Distribution connection

The existing distribution network between the existing switchgear building (Figure 4-3) and Endeavour Energy's Guildford substation would be utilised as part of the development (Figure 2-1).

Figure 4-3: Existing switchgear building

The Guildford substation is situated approximately 570 metres east of the Project Site. No upgrades or works are required to this distribution network or Endeavour Energy's Guildford substation.

To establish a connection between the BESS and the grid (i.e. the Guildford substation), transformers will be employed to convert the electricity at the BESS to 33 kV. An example of a medium voltage transformer is shown in Figure 4-4.

Figure 4-4: Example of transformer

A 33 kV reticulation system will link the transformers to the existing switchgear building positioned in the northeast corner of the SEF via a 33 kV switch room. The switch room is expected to be a small outdoor enclosure, or an extension of the existing switchgear building. Figure 4-5 provides an example of a typical outdoor switch room.

Figure 4-5: Example outdoor switch room

Minor upgrades at the switchgear building would be undertaken to enable to the connection. The existing switchgear building is shown in Figure 4-3.

4.2.3 Ancillary design elements and interface with SEF

To support operation of the Project several ancillary elements are proposed and / or would utilise existing SEF infrastructure / facilities. These are described in Table 4-3 and shown in Figure 4-1.

Table 4-3: Project ancillary design elements

Design element	Description
Site access and parking	Access to and from the Project Site would be via the existing entrance off Herbert Place. Herbert Place is accessed via the Cumberland Highway. The existing internal road network can be used. The existing car park area at the SEF would accommodate a total of five spaces for operational and maintenance staff and visitors.
Fencing	Security fencing (e.g. chain link or palisade) would be installed along the perimeter of the BESS facility.
Signage	Signs would be situated at various locations across the Project Site. These signs would be for the purposes of way finding, safety and building identification.
Lighting	Standard lighting would be required for the BESS facility for safety and security and to allow for out of daylight hours maintenance, as required. External lighting design would be consistent with *AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace, Part 5: Outdoor workplace lighting and AS 4282-1997 Control of the obtrusive effects of outdoor lighting.*
Drainage infrastructure	The Project would utilise the existing stormwater management infrastructure at the SEF to manage runoff during operation of the Project. The existing stormwater network and stormwater treatment measures are detailed in Chapter 12 and Appendix G.
Services and utilities	Proposed service and utility connections to the Project Site include: • Connections to telecommunications infrastructure via fibre optic cable for high-speed internet • Electrical supply for SCADA system • Sewage would be managed via the existing sewage treatment system.
Fire management	The SEF is connected to water mains and includes a water tank on the western boundary. All fire safety systems would be detailed in a Fire Safety Study prepared in consultation with FRNSW.

4.3 Construction

This section details construction activities required to facilitate the Project.

4.3.1 Construction activities

Key construction activities are expected to include:

- Site enabling works[1] , including:
  - Establishment of temporary environmental and safety controls
  - Establishment of construction laydown areas, as required, in consultation with landowners
  - Utility works (including disconnections) to enable construction
  - Establishment of temporary construction site offices at the laydown area
  - Surveying and investigations of onsite condition to implement final design (where required).
- Earthworks, levelling, and other civil and ground preparation activities, including the removal of spoil from the Project Site, as required
- Delivery, installation and electrical fit-out for the Project, including control building, battery enclosures, inverters, transformers and associated cabling and infrastructure
- Connections between the BESS and the existing SEF switchgear building
- Permanent environmental management and pollution control measures
- Testing and commissioning
- Removal of construction equipment and rehabilitation of construction areas

It is likely that some elements would be prefabricated offsite and transported to the Project Site via heavy vehicles, where they would then be installed. The batteries would be containerised on areas of hardstand.

4.3.2 Construction program

Construction would begin as soon as practicable after all regulatory approvals are obtained, anticipated to be mid to late 2024 and would take approximately 12 months to complete. The Project would be constructed within a single continuous construction period (i.e. not staged).

4.3.3 Construction hours

Construction of the Project would be undertaken during standard construction hours:

- Monday to Friday: 7.00 am to 6.00 pm
- Saturday: 8.00 am to 1.00 pm
- No works of Sunday and public holidays.

[1] A separate development application (DA 94/165 MOD 3) will be undertaken prior to this Project to remove the existing cooling towers and construct and operate a replacement cooling system within the SEF. Refer to Section 2 for further information.

Certain activities may be required outside of the standard construction hours. Key stakeholders would be informed prior to out of hours activities. These activities potentially include:

- Delivery of plant and equipment for safety reasons (e.g. OSOM vehicles)
- Commissioning and testing activities that must align with demands on the grid
- Emergency work to avoid damage to persons or property and/or to prevent environmental harm
- Construction works where it can be demonstrated and justified that these works are required to be undertaken outside of standard construction hours.

4.3.4 Construction compound

A temporary compound would be required to support construction of the Project. The location of the compound is indicative and subject to confirmation by the construction contractor, once appointed. It is anticipated that the temporary construction compound would be located within the adjacent Visy or Kingspan sites (subject to further consultation) as presented in Figure 4-6. Not all these areas presented would be used and would be refined during detailed design and consultation outcomes.

It is anticipated that the compound area would be used for any of the following:

- Site office and amenities
- Staff parking area
- Equipment and vehicle storage areas
- Laydown areas for construction materials
- Stockpiling of excavated materials and soil
- Bunded fuel storage areas.

The construction compound would be temporary in nature and removed / decommissioned at the completion of construction. Decommissioning of the construction compound would include rehabilitation of the location to the pre-construction standard.

If an alternative compound is required, the following site selection criteria would be applied to their location:

- Proximity to the Project Site
- Access to the local road network
- Relatively level land
- Greater than 50 metres from a watercourse
- Greater than 50 metres from threatened species and endangered ecological communities
- Greater than 100 metres from a residential dwelling
- No requirement to remove any native vegetation beyond that otherwise being undertaken for the Project
- No requirement to undertake any significant ground disturbing works
- No impact on any heritage items (Indigenous or non-Indigenous)
- Not unreasonably affect the land use of adjacent properties.

Consideration to all of the above factors would be undertaken prior to the establishment of any additional or alternative construction compound or stockpiles for the purpose of the Project.

4.3.5 Construction plant and equipment

The plant and equipment that are likely to be used during the construction include:

- Excavators
- Small compactors (whacker packer)
- Concrete trucks and pumps
- Cranes
- Manitou
- Elevated work platforms
- Elevated work platforms
- Concrete saws
- Cable laying machine and/or cable winch
- Light vehicles
- Hand tools

4.3.6 Construction materials

Construction materials will be sourced locally where practicable. The following key materials are likely to be required for the construction of the project:

- Structural steel
- Concrete
- Cabling
- Prefabricated enclosures and buildings
- Sand (for cable bedding), gravel, and bitumen.

Water used directly on site for construction would predominantly relate to dust suppression. Water would be sourced from the municipal water supply (in agreement with the relevant authority).

4.3.7 Construction traffic, access and parking

4.3.7.1 Construction traffic movements

Vehicles associated with construction works would include light vehicles (workers travelling to and from the Project Site at the start and end of shifts) and heavy vehicles delivering / removing construction materials, battery components and cooling system components.

Heavy vehicles would deliver equipment and battery components and would also be used for the removal of waste material resulting from construction activities. It is anticipated that the majority of the BESS infrastructure (e.g., BESS modules), transformers and switchgear would be procured offshore, and Port Botany would be the preferred port of entry.

Construction materials would be sourced from nearby concrete batching plants (such as Boral Concrete located on Long Street) and hard rock quarries where possible. Construction labour, equipment and plant would likely be sourced from within Sydney.

The following maximum vehicle movements are predicted (subject to detailed design):

- An average of up to 30 passenger vehicles per day (30 in and 30 out) during the construction works phase
- An average of up to 15 heavy vehicles per day (15 in and 15 out) during the construction works phase
- OSOM vehicles during the construction works phase. This would be subject to detailed construction planning and is anticipated to be minimal.

Average daily heavy vehicle movements during the construction phase will generally be significantly lower than outlined above as the delivery of enclosures is anticipated to occur in batches.

4.3.7.2 Access

Access to and egress from the Project Site during construction would be via the existing access point off Herbert Place (see Figure 4-1). This access point would also be used as the operational entry point for vehicles.

4.3.7.3 Parking

The following hierarchy would be applied to accommodate construction workforce parking:

- Existing parking within the SEF would be utilised (capacity of around 20 light vehicles)
- Car parking within the proposed construction compound (anticipated to be for 10 light vehicle)
- In consultation with neighbouring landowners.

4.3.8 Construction workforce

It is anticipated that up to 30 personnel a day would be required during the peak construction periods of the Project. The construction workforce would include (but not be limited to) the following:

- Tradespeople and construction personnel
- Sub-contractor construction personnel
- Engineers
- Functional and administrative staff.

4.3.9 Construction environmental management plan

A Construction Environmental Management Plan (CEMP) (or equivalent) would be developed that details environmental management systems and processes for construction of the Project. The CEMP would provide the framework for the management of all potential environmental impacts resulting from the construction activities.

The CEMP would be prepared based on the mitigation and management measures identified in this EIS (refer to Chapter 1) and the Conditions of Approval. The specified documentation would be required to be prepared and approved prior to the commencement of works and adhered to for the duration of construction.

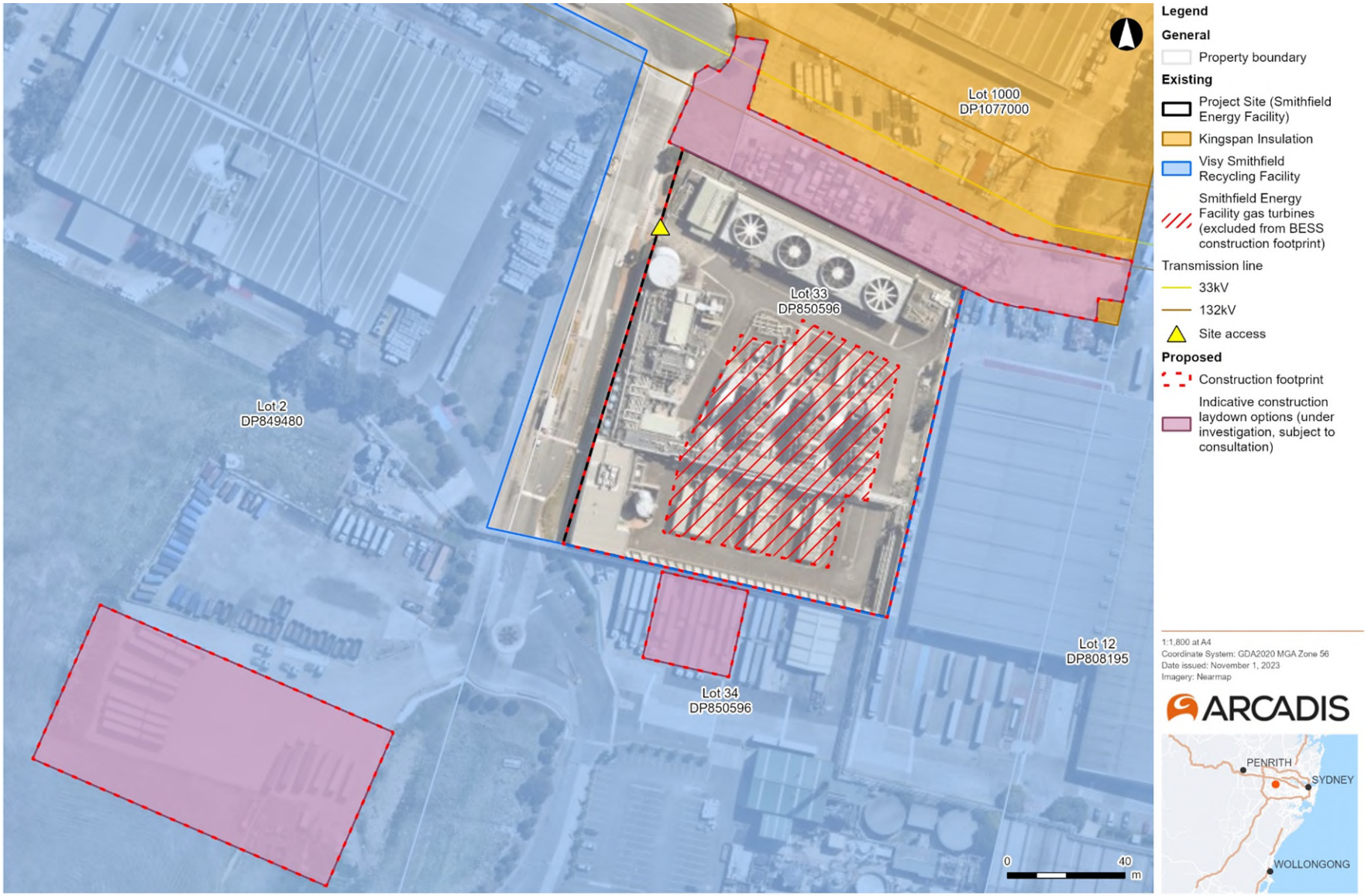


Figure 4-6: Construction overview

4.4 Operation

The Project would be operational 24 hours, seven days a week. The Project would generally be managed and monitored remotely apart from periodic site maintenance which would require maintenance staff to access the site. Ongoing operational maintenance would require up to four operational personnel.

During operation, activities on-site would generally comprise:

- Storage of electricity and provision to the broader electricity grid as required to meet the strategic objectives of the Project
- Routine inspections
- Repair and maintenance of Project infrastructure such as battery enclosures, inverters, transformers and cables
- Ongoing security monitoring.

4.4.1 BESS replacement and decommissioning

The BESS units have a design life of 15-20 years. At the end of operational life, this may be extended subject to the replacement of components and market conditions. It is expected that with improved technology, the battery units could be upgraded and be maintained to extend the life of the BESS. Any wholescale repowering would seek to make use of the existing foundations, connections and switchyard and would generally comprise swapping out and recommissioning BESS containers.

If a battery unit faults and is beyond repair, the unit will be removed and recycled for materials, where practicable.

In the case of a full decommissioning of the BESS, the Project Site would be repurposed for other industrial uses as determined by the Proponent (and subject to separate approvals being obtained for those uses).

4.4.2 Operational environmental management plan

An Operational Environmental Management Plan (OEMP) (or equivalent) would be prepared to provide the overarching framework for the management of all potential environmental impacts resulting from the operation of the Project.

5 Statutory Context

This chapter describes the environmental impact assessment and approval process for the Project, as well as other relevant environmental planning and statutory approval requirements as required by the SEARs. A complete SEARs compliance table is presented in Appendix A.

5.1 Commonwealth Legislation

5.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas.

Under the EPBC Act, a referral to the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) is required for proposed 'actions' that have the potential to significantly impact on any Matter of National Environmental Significance (MNES) or the environment of Commonwealth land (including leased land).

Current matters of MNES are:

- World heritage properties
- National heritage places
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- Nationally listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act also requires Commonwealth approval for any activity that will, or is likely to have, a significant impact on Commonwealth land. The land on which the Project would be constructed is not Commonwealth land, and there is no Commonwealth land within close proximity to the Project that could be impacted by the construction or operation of the Project.

A search of the EPBC Act Protected Matters Search Tool was undertaken on 23 January 2023 for a five kilometre buffer around the site. The search identified eight threatened ecological communities, 52 threatened species and 16 migratory species with the potential to occur within five kilometres of the site. The results of a Protected Matters search for MNES within five kilometres of the site are provided in Table 5-1. To supplement the Protected Matters search, ecological site inspections and database reviews were undertaken, concluding that the Project would not have any significant impacts on biodiversity values.

A Biodiversity Development Assessment Report (BDAR) waiver was lodged as part of the Scoping Report and was approved by the DPE on 20 July 2023. The Project would not adversely impact upon any of the identified MNES and would not represent a Controlled Action under the EPBC Act. See Appendix J for a copy of the BDAR Waiver approval.

Table 5-1: Protected Matters within five kilometres of the Project Site

Protected Matters within 5 Kilometres of the Project Site (EPBC Act)	Count
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance (Ramsar wetlands)	None
Listed Threatened Species	52
Listed Threatened Ecological Communities	8
Listed Migratory Species	16
The Great Barrier Reef Marine Park	None
Nuclear actions (including uranium mining)	None

5.1.2 Native Title Act 1993

An objective of the Commonwealth *Native Title Act* 1993 is to recognise and protect native title. Section 8 states that the *Native Title Act 1993* is not intended to affect the operation of any law of a State or a Territory that is capable of operating concurrently with the Act.

Searches of the registers maintained by the National Native Title Tribunal indicate there are no native title claims or any indigenous land use agreements registered with respect to land within the Project Site.

5.2 New South Wales legislation

The EP&A Act and the EP&A Regulation are the primary pieces of legislation that regulate land use planning and development assessment in NSW. This legislation is supported by a range of environmental planning instruments, including State environmental planning policies and local environmental plans.

5.2.1 Environmental planning approval pathway

5.2.1.1 Permissibility

Division 4 of the T&I SEPP applies to development for the purposes of electricity generating works or solar energy systems.

Electricity generating works are defined in Clause 2.35 as

'a building or place used for the following purposes, but does not include a solar energy system –

a. making or generating electricity,
b. electricity storage'

Development permitted with consent is defined in Clause 2.36(1) as

'development for the purpose of electricity generating works may be carried out by any person with consent on the following land –

a. in the case of electricity generating works comprising a building or place used for the purpose of making or generating electricity using waves, tides or aquatic thermal as the relevant fuel source - on any land
b. in any other case—any land in a prescribed rural, industrial or special use zone.'

The Project Site (Lot 33, DP850596) is located on land within the Cumberland LGA on land zoned as E4 General Industrial. In accordance with Clause 2.36(1)(b), the Project is therefore permissible with development consent under the provisions of the T&I SEPP.

5.2.1.2 State Significant Development

Section 4.36 of the EP&A Act provides for the declaration of a project as SSD. The declaration of a project as SSD under Section 4.36 of the Act can be by meeting the requirements of a SEPP or by the Minister for Planning.

Clause 2.6 of the Planning Systems SEPP states that development is declared to be SSD for the purposes of the EP&A Act if:

a. *The development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
b. *The development is specified in Schedule 1 or 2.*

Clause 20 of Schedule 1 of the Planning Systems SEPP declares development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) to be SSD if it either –

a. *Has a capital investment value of more than $30 million, or*
b. *Has a capital investment value of more than $10 million and is located in an environmentally sensitive area of State significance.*

The Project is expected to have a capital investment value of around $93 million.

The Project is considered to meet the definition of SSD under Clause 2.6 of the Planning Systems SEPP, as the Project would be for electricity generating works on land that is permitted with development consent under Clause 2.36(1)(b) of the T&I SEPP, and would have a capital investment value greater than $30 million.

Development consent for the Project is therefore being sought in accordance with Part 4, Division 4.7 of the EP&A Act.

5.2.1.3 Planning approval process under Division 4.7 of the EP&A Act

The assessment and approval process for an SSD project is established under Part 4, Division 4.7 of the EP&A Act. The Project requires an SSD application is to be accompanied by an EIS prepared by or on behalf of the applicant in the form prescribed by the regulations, in accordance with Section 4.12(8) of the EP&A Act.

The EIS for the Project will be informed by the SEARs. The Proponent submitted its Scoping Report to the DPE on 25 May 2023 to seek the SEARs, as required by Section 4.12(8) of the EP&A Act. The SEARs were issued on 13 July 2023. This EIS has been prepared in accordance with the SEARs and the requirements of Schedule 2 of the EP&A Regulation. Appendix A provides a summary of all the SEARs and Appendix B summarises the requirements of Schedule 2 of the EP&A Regulation. Where each of these requirements has been addressed in the EIS is also provided.

The DPE will place the EIS on public exhibition for a minimum of 28 days (as per Schedule 1, Division 2, Clause 9 of the EP&A Act). During the exhibition period, the community, stakeholders and government agencies will have an opportunity to review the EIS and provide a written submission to DPE for consideration in its assessment of the Project.

At the completion of the public exhibition period, DPE will provide the Proponent with a copy of all submissions received during the exhibition period. After reviewing the submissions, the Proponent will prepare a Submissions Report that responds to the relevant issues raised. If changes are required to the Project as a result of the issues raised

or to minimise environmental impacts, the Proponent would prepare a report to address these changes and submit this for review by the DPE, after which it would be made available to the public.

The Minister for Planning is the consent authority for SSD projects. The Minister for Planning has issued a general delegation of the consent authority function for SSD projects to the Independent Planning Commission in instances where more than 50 public objections are received on the application, the applicant has made a reportable political donations disclosure and/or Cumberland City Council object to the Project.

5.2.2 NSW Environmental Planning Instruments

Consideration and discussion of State Environmental Planning Policies which are considered relevant to the Project are summarised in Table 5-2.

Table 5-2: Environmental Planning Instruments

Environmental Planning Instrument	Considerations	Relevance to the Project	Relevant section(s) in EIS
Planning Systems SEPP	The Planning Systems SEPP identifies development that is SSD.	As the Project is electricity generating works and has a capital investment value of over $30 million, it is considered SSD.	Section 5.2.1
T&I SEPP	The T&I SEPP aims to facilitate the effective delivery of infrastructure across NSW.	Division 4 of the T&I SEPP applies to the Project, as it is considered to be development for the purposes of electricity generating works or solar energy systems.	Section 5.2.1
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP)	The B&C SEPP provides a framework for the regulation of the clearing of native vegetation in NSW.	Based on the ecological field inspections and database reviews, it was concluded that the Project would not have any significant impacts on biodiversity values. A BDAR waiver submission was included in the request for SEARs. The BDAR waiver was granted by the Planning Secretary on 20 July 2023. The Project is located within the Georges River Catchment Area. A Water Impact Assessment has been undertaken to assess potential water related impacts associated with the Project. The assessment concluded water quality of the catchment area would not be detrimentally impacted.	Chapter 17 Appendix J BDAR Waiver Approval Chapter 12
State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP)	The R&H SEPP applies to any projects that fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. Certain activities may involve handling, storing or processing a range of substances which in the absence of locational, technical or operational controls may create a risk or offence to people, property or the environment. Such activities would be defined as potentially hazardous or potentially offensive.	The Project is not considered to be a 'potentially hazardous industry' or 'potential offensive industry' under the R&H SEPP. Nonetheless, the EIS includes an assessment of potential hazards and risks associated with the construction and operation of the Project. A Preliminary Hazard Analysis (PHA) has been undertaken to assess the potential hazards and risk associated with the Project. The assessment concluded the Project would not involve any potentially hazardous activities that would pose a significant risk to human health, life or property, or to the biophysical environment	Chapter 10 Appendix E Preliminary Hazard

Environmental Planning Instrument	Considerations	Relevance to the Project	Relevant section(s) in EIS
R&H SEPP *Chapter 4 (Remediation of land)*	The R&H SEPP provides a state-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. In accordance with Chapter 4 (Remediation of land) of the R&H SEPP, a consent authority must not consent to the carrying out of development on any land unless: • It has considered whether the land is contaminated. • If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out. • If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied the land would be remediated before the land is used for that purpose.	A review of potential contamination issues for the Project has been carried out in accordance with the contaminated land planning guidelines to inform the design and EIS.	Chapter 11 Appendix F Preliminary Site Investigation
R&H SEPP *Chapter 2 (Coastal Management)*	The R&H SEPP provides an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*. In accordance with Chapter 2 (Coastal Management) of the R&H SEPP, a consent authority must not consent to the carrying out of development on any land unless the consent authority is satisfied that development on coastal zones has been considered.	The Project is not located on land mapped as coastal wetland and littoral rainforest area, proximity area for coastal wetland and littoral rainforest area, coastal vulnerability area, coastal environment area or coastal use area. The nearest coastal zone (proximity area for coastal wetland and littoral rainforest area) is located around 200 metres to the south of the Project Site. The construction and operation of the Project would not impact on this coastal zone.	Chapter 11 Appendix F Preliminary Site Investigation

Environmental Planning Instrument	Considerations	Relevance to the Project	Relevant section(s) in EIS
State Environmental Planning Policy (Sustainable Buildings) 2022 (SB SEPP)	The SB SEPP encourages the design and construction of more sustainable buildings across NSW. The policy aims of this Policy are: • to encourage the design and delivery of sustainable buildings • to ensure consistent assessment of the sustainability of buildings • to record accurate data about the sustainability of buildings, to enable improvements to be monitored • to monitor the embodied emissions of materials used in construction of buildings • to minimise the consumption of energy • to reduce greenhouse gas emissions • to minimise the consumption of mains-supplied potable water • to ensure good thermal performance of buildings.	The initiation of the development application (the Scoping Report) was submitted on the NSW planning portal on 9 June 2023, prior to 1 October 2023. As such the SB SEPP does not apply in accordance with Section 4.2(1).	Not applicable

5.3 Other New South Wales legislation

In accordance with Section 4.41 and 4.42 of the EP&A Act, some environmental planning legislation does not apply to SSD projects or must be applied consistently with an approval for SSD.

5.3.1 Approvals or Authorisations that are not required or cannot be refused

Environmental approvals or authorisations that are not required or cannot be refused for SSD, but which have been considered in the preparation of this EIS are listed in Table 5-3.

Table 5-3: Relevant approvals considered but not required under Section 4.41 of the EP&A Act

Approval	Comment
A permit under section 201 of the *Fisheries Management Act 1994*	The Project would not involve dredging or reclamation works.
A permit under section 205 of the *Fisheries Management Act 1994*	No works are proposed in waterways. The Project would not impact on any marine vegetation that is protected under this section.
A permit under section 219 of the *Fisheries Management Act 1994*	No works are proposed in waterways. The Project would not result in the blockage of fish passage
An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*	No non-Indigenous items were identified to occur on the site or surrounding properties based on a review of the Cumberland Local Environmental Plan (LEP) and the NSW heritage register.
An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*	A basic search of the Aboriginal Heritage Information Management System (AHIMS) register on 23 January 2023 identified no Aboriginal heritage sites within a 200 m buffer of the Project Site. Given the developed nature of the Project Site, the potential for Aboriginal heritage to be encountered is considered low.
A bushfire safety authority under section 100B of the *Rural Fires Act 1997* (RF Act)	The Project Site is not located within a designated bushfire prone area.
A water use approval (Section 89), a water management work approval (Section 90) or an activity approval (other than an aquifer interference approval) (Section 91) of the *Water Management Act 2000* (WM Act)	The Project would not use water from a 'water source' in NSW, which means a water use approval under Section 89 of the WM Act will not be required for the Project. The Project would not involve the carrying out of any water management work as defined in Section 90 of the WM Act, which means a water management works approval under that section would not be required for the Project. The Project is not located on or under waterfront land, which means a controlled action approval under Section 91 of the WM Act would not be required for the Project.

Section 4.42 of the EP&A Act identifies approvals or authorisations that cannot be refused if they are necessary for carrying out approved SSD and must be substantially consistent with the Part 4, Division 4.7 approval.

The statutory approvals or authorisations of potential relevance to the Project include:

- A consent under Section 138 of the *Roads Act 1993*.

5.3.2 Consideration of other NSW legislation

Environmental planning related legislation and regulations that may still be applicable to approved SSD projects and their consideration in the context of the Project, are identified in Table 5-4.

Table 5-4: NSW legislation and regulations of potential relevance

Legislation	Requirement	Relevance to the Project	Relevant section(s) in EIS
Biosecurity Act 2015	This Act aims to protect natural resources from the adverse impact of pests, disease, weeds and contaminants on agricultural land and parks and reserves (such as those near to the Project Site). All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose.	During construction of the Project, any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.	Chapter 17
Biodiversity Conservation Act 2016 (BC Act)	The BC Act seeks to: • Conserve biological diversity at the bioregional and State scale • Maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations • Assess the extinction risk of species and ecological communities and identify key threatening processes through an independent and rigorous scientific process • Establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity.	Based on the ecological field inspections and database reviews, it was concluded that the Project would not have any significant impacts on biodiversity values. A Biodiversity Development Assessment Report (BDAR) waiver was granted by the Planning Secretary on 20 July 2023 and has been provided in Appendix H.	Chapter 17 Appendix J BDAR Waiver Approval
Contaminated Land Management Act 1997 (CLM Act)	This CLM Act outlines the circumstances in which notification to the Environment Protection Authority (EPA) is required in relation to the contamination of land. This may become relevant during construction of the Project if contamination is encountered. A public register of notifications under this Act is maintained.	A review of potential contamination issues for the Project has been carried out in accordance with the contaminated land planning guidelines to inform the design and EIS.	Chapter 11
Heritage Act 1977 (Section 146)	If a relic is discovered or located, the Heritage Council must be notified 'of the location of the relic, unless he or she believes on reasonable grounds that the Heritage Council is aware of the location of the relic'.		Chapter 17

Legislation	Requirement	Relevance to the Project	Relevant section(s) in EIS
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act is the key piece of environment protection legislation administered by the EPA. • Section 120 of the Act prohibits the pollution of waters • Air pollution-related Sections 124 to 126 (Chapter 5, Part 5.4, Division 1) of the Act require activities to be conducted in a proper and efficient manner, while Section 128 (Chapter 5, Part 5.4, Division 1) of the Act requires that all necessary practicable means are used to prevent or minimise air pollution • Pollution of land and waste is covered by Part 5.6 of the Act. It defines offences relating to waste and sets penalties and establishes the ability to set various waste management requirements via the *Protection of the Environment Operations (Waste) Regulation 2014*.	The activities listed in Schedule 1 to the Act (broadly, activities with potentially significant environmental impacts) require an EPL. The operation of the BESS does not constitute any of the scheduled activities and therefore does not require an EPL. The SEF holds EPL 5701 for the scheduled activity of electricity generation. The EPA would be consulted further to confirm the need to vary EPL 5701 prior to the commencement of any work in relation to this Project.	Section 6.5
RF Act	Sections 63(1) and 63(2) of the RF Act require public authorities and owners/occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires on or from, that land.	The Project Site is not located within a designated bush fire prone area.	Chapter 17
Roads Act 1993	Under Section 138 of the Roads Act, approval is required before any works can be undertaken within a public road reserve.	Access to and egress from the Project Site during construction would be via the existing access point off Herbert Place. This access point would also be used as the operational entry point for vehicles.	Chapter 8 Appendix C Traffic Impact Assessment

5.4 Local environmental planning legislation

5.4.1 Cumberland Local Environmental Plan 2021

The Project Site is located within the Cumberland LGA located on land zoned as E4 General Industrial. An overview of the land use zone objectives of the Cumberland LEP 2021 is provided in Table 5-5. The Project is consistent with the objectives of the land use zones within which it is located.

Table 5-5: Land use objectives

Land use zone	Land use objectives	Consistency
E4– General Industrial	• To provide a wide range of industrial, warehouse, logistics and related land uses • To ensure the efficient and viable use of land for industrial uses • To minimise any adverse effect of industry on other land uses • To encourage employment opportunities • To enable limited non-industrial land uses that provide facilities or services to meet the needs of businesses and workers.	The Project is located within a well-established industrial area where energy distribution services currently exist. The Project will employ up to 30 construction workers. Mitigation will be implemented to minimise any detrimental environmental effects

A number of additional local provisions contained in Part 7 of the Cumberland LEP 2021 have been considered where relevant, as part of the EIS, including earthworks, flood planning, stormwater management and salinity.

5.4.2 Cumberland Development Control Plan

The new Cumberland Development Control Plan (DCP) adopted by Cumberland City Council came into operation on 5 November 2021. The DCP supports the Cumberland City Council LEP 2021 by providing more detailed controls that apply to the Cumberland LGA.

The objectives of the DCP are to:

- Ensure that development promotes economically, socially and environmentally sustainability and is designed to avoid, minimise and manage potential environmental risks
- Ensure future development has consideration for all existing and future residents of the Cumberland City at all stages of their life cycle
- Ensure new developments enhance Cumberland as a great place to live and work and deliver the desired future character
- Ensure new development is integrated with existing and planned transport systems and promote sustainable transport behaviour within Cumberland
- Provide an appropriate opportunity for the public to participate in the development process

As the Project is SSD, the provisions of the Cumberland DCP do not apply. However, consideration has been given to the objectives of the Cumberland DCP throughout the EIS, in order to demonstrate consistency of the Project with the overarching aims of Cumberland City Council for the Project. Cumberland DCP Parts D (Development in Industrial Zones) and Parts G (Miscellaneous Development Controls) are considered relevant to the Project.

6 Engagement

This chapter provides a summary of consultation activities undertaken for the Project including details of how issues raised during consultation have been addressed.

6.1 Overview

Community and stakeholder engagement for the Project is being undertaken in accordance with *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022) and Iberdrola Australia's *Community and Stakeholder Engagement Policy* (Iberdrola Australia, 2023). Iberdrola is also a signatory of the Clean Energy Council's Best Practice Charter for Renewable Energy Projects and commits to honouring the Charter in renewable energy projects and associated transmission infrastructure.

Community and stakeholder engagement activities regarding the Project commenced in early 2023.

Engagement for this EIS focused on providing stakeholders with concise information regarding the project and direct channels for two-way communication and feedback. The engagement strategy involved identifying and categorising stakeholders and tailoring the engagement approach based on feedback received during the Scoping Report Phase and their level of perceived impact caused by the Project. All stakeholder consultation for the Project was tracked using a centralised internal stakeholder management tool. This approach will be refined based on the level and nature of feedback for the next stage of the assessment process.

6.2 Consultation objectives

The communication and engagement objectives for the Project are to:

- Inform interested and potentially affected businesses, communities and stakeholders about the design, development and potential impacts of the Project
- Build and develop community and key stakeholder relationships
- Encourage stakeholder participation
- Obtain government, community and stakeholder input for consideration in development of the Project
- Inform all stakeholders about the planning approval process
- Understand community and stakeholder priorities and concerns so they can be considered in the ongoing development and delivery of the Project.

6.3 Identification of stakeholders

Stakeholders were identified as those that may be interested in, or who may be affected by, the Smithfield BESS. Stakeholders were categorised into three main groups to effectively implement appropriate engagement techniques across each. These are listed in Table 6-1:

- Government and technical stakeholders
- Affected landowners
- The wider community.

Stakeholders will continue to be identified and consulted during all project phases, including if approved, the construction, operation, and decommissioning and rehabilitation phases of the Smithfield BESS.

Table 6-1: Stakeholder consultation

Stakeholder group	Stakeholders
Government and technical stakeholders	
State government	• DPE (including BCS and Hazard teams) • FRNSW • EPA • Transport for NSW (TfNSW)
Local government	• Cumberland City Council
Utility providers	• Jemena
Adjacent landowners	
Landowner	• Visy Recycling (Land owner 6 Herbert Place, Smithfield) • Kingspan (Land occupier 3 Herbert Place, Smithfield) • Goodman (Land owner 3 Herbert Place, Smithfield)
Wider community	
Neighbours	• All residential properties within 750 metres of the Project Site

6.4 Engagement approach

Stakeholder engagement for the Project was undertaken in accordance with principles outlined in the *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022) document. Table 6-2 outlines how these principles were applied for the Project.

Table 6-2: Alignment of key DPE engagement principles with the Project

Principle as extracted from Section 3.7 of *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022)	Application to the Project
Identify the people or groups who are interested in or are likely to be affected by the project	Section 6.3
Ensure the community are provided with safe, respectful and inclusive opportunities to express their views	Section 6.4.2
Use appropriate engagement techniques.	Section 6.4
Be innovative in their engagement approach and tailor engagement activities to suit the: – context (e.g. sensitivity of the site and surrounds) – scale and nature of the project and its impacts – level of interest in the project	See Section 6.4.2
Provide clear and concise information about what is proposed and the likely impacts for the relevant people or group they are engaging with	See Section 6.5
Involve the community, councils and government agencies early in the development of the proposal, to enable their views to be considered in project planning and design	See Section 6.5
Clearly outline how and when the community can be involved in the process	See Section 6.4.2

6.4.1 Government and technical stakeholders

The consultation mediums adopted differed depending on the agency engaged with and the nature and level of their interest in the Project. Consultation mediums included:

- Face to face meetings
- Virtual meetings
- Telephone conversations
- Email correspondence
- Letter correspondence.

6.4.2 Impacted landowners and wider community

Community engagement implemented for the EIS was multifaceted for two key reasons. Firstly, not all community stakeholders are considered equally interested or impacted by the project, highlighting the importance of tailored engagement proportionate to the perceived interest/level of impact resulting from the Project. Secondly, it was acknowledged that some stakeholders do not feel comfortable being engaged directly face-to-face and have a preferred method or medium of communication for providing feedback. For these reasons a range of engagement methods were implemented during the EIS phase, as outlined in Table 6-3.

Table 6-3: Engagement methods

Engagement method	Targeted community stakeholder group	Purpose
Project website	All interested parties	To provide an overview of the Project, the environmental impact assessment process and key findings, answers to frequently asked questions, access to relevant documentation and an opportunity to provide project feedback (via either email or telephone). The Project website can be accessed at via the Iberdrola Australia website (https://www.iberdrola.com.au/our-assets/development-assets/smithfield-battery/)
Newsletter	All interested parties	To provide project overview, answers to frequently asked questions, access to key documents, access to feedback channels and to invite comments. Refer to Figure 6-1 to see newsletters distributed.
Face to face (door knock)	Neighbouring landowners	To provide basic project information, upcoming milestone details, feedback form/methods and gauge community sentiment.
One on one meetings	Affected landowners	To provide presentation and meeting about the Project to discuss Project-specific aspects relevant to the stakeholder, establish and foster relationship and open communication channel and maintain ongoing stakeholder dialogue.
Enquiry lines (phone and email)	All interested parties	To provide community stakeholders with lines of enquiry to the Project team.

5th of September 2023

Dear Community Member,

Re: Proposed Smithfield Battery Project

We are writing to you as you live in the area nearby our proposed Smithfield Battery Project. This letter provides you with some information about Iberdrola Australia as well as details of the large-scale battery we are proposing.

Iberdrola Australia

Iberdrola Australia has 20 years of experience in the renewable energy industry in Australia, operating 1.5 gigawatts (GW) of renewable projects. Our vision is to accelerate the take-up of clean energy in Australia by increasing investment to support Australia's energy transition. We are currently developing a pipeline of approximately 1000 Megawatts (MW) across Australia.

We develop, construct, own and operate our projects responsibly with a focus on community and sustainability outcomes and we are committed to being the lead green energy provider for Australian businesses.

Iberdrola Australia is part of the Iberdrola Group, operating globally and recognised as sustainability leaders.

Our head office is located in Sydney and we have offices in Brisbane and Melbourne.

Proposed Smithfield Battery

We are in the process of preparing an Environmental Impact Statement (EIS) to support a Development Application with the NSW Department of Planning and Environment to construct and operate a large-scale energy storage battery at 6 Herbert Place, Smithfield NSW.

The Project Site is proposed to be situated within an existing industrial area, known as the Smithfield Recycling and Manufacturing Precinct. The Smithfield Battery Project is proposed to be located within the Smithfield Energy Facility, which currently houses an Open Cycle Gas Turbine (OCGT or peaking plant) which has been operating since 2017. The Smithfield Energy Facility is owned and operated by Iberdrola Australia . The proposed location of the Smithfield Battery Project is provided in Figure 1.

The proposed Smithfield Battery Project will have a capacity of up to 65 megawatts (MW) and 2 hours of storage and will use the existing transmission line infrastructure to connect into the grid. The battery, including ancillary infrastructure, requires a total land area of approximately 3,000 m^2 (0.3 hectares).

Figure 1 – Smithfield Battery Project Location

What does a big battery look like?

A big battery, sometimes called a grid-scale battery or a battery energy storage system (BESS), uses similar battery technology to a laptop or mobile phone but at a much larger scale. Big batteries typically use hundreds of lithium-ion battery packs arranged in outdoor cabinets between the size of a large domestic refrigerator up to a standard shipping container.

Lake Bonney Battery, one of Iberdrola Australia's operational battery projects located in South Australia, is shown in Figure 2. The capacity of Lake Bonney Battery is 25MW with 2 hours of storage. The battery itself takes up an area of around 0.3 ha.

Community Benefits

Iberdrola Australia is committed to working with local communities and stakeholders to ensure our projects have positive long-lasting impacts.

We seek to act as a good neighbour, establish long-term relationships, and become an integral member of the local communities within which we operate. We look for opportunities to share the benefits of our projects with the local community and are informed of these through our community engagement process.

The Smithfield Battery Project is expected to contribute to the reduction in the cost of supplying electricity to consumers in NSW, thereby supporting the goals and objectives of the electricity generation, supply and transmission policies in NSW.

Figure 2 - Lake Bonney Battery in South Australia

Share Your Feedback

As a State Significant Development (SSD), the proposed Smithfield Battery Project will undergo a rigorous approval process led by the NSW Department of Planning and Environment. A Scoping Report was recently lodged with the Department resulting in the issue of Secretary's Environmental Assessment Requirements (SEARs). The Scoping Report and SEARs can both be viewed via the Major Projects Website: www.planningportal.nsw.gov.au/major-projects. The requirements detailed in the SEARs are currently being reviewed and will be addressed through the studies forming the Environmental Impact Statement (EIS).

A key activity within this process is the engagement with neighbours and local communities. Effective engagement allows us to incorporate local knowledge and relevant feedback into our designs and also inform us on the best ways to engage with the community moving forward.

Your insights and feedback matter to us, and we invite you to actively participate throughout the project's development. To share your feedback and to stay informed about the proposed Smithfield Battery Project please do so via the following methods:

- Email: smithfieldbattery@iberdrola.com.au
- Phone:
  - Weekdays, 9am to 5pm: Ben Fethers
  - 24 hours, free within Australia: 1800 917 372
- Post: Level 22, Governor Philip Tower, 1 Farrer Place, Sydney, NSW 2000.

If you would like a face-to-face meeting with a member of the project team, please let us know.

Join our Mailing List

If you would like to join our mailing list and receive updates on the project please scan the QR below with your mobile phone and fill in your details.

Or use the following link to fill in your details: https://forms.office.com/e/7W7CzRmrWP

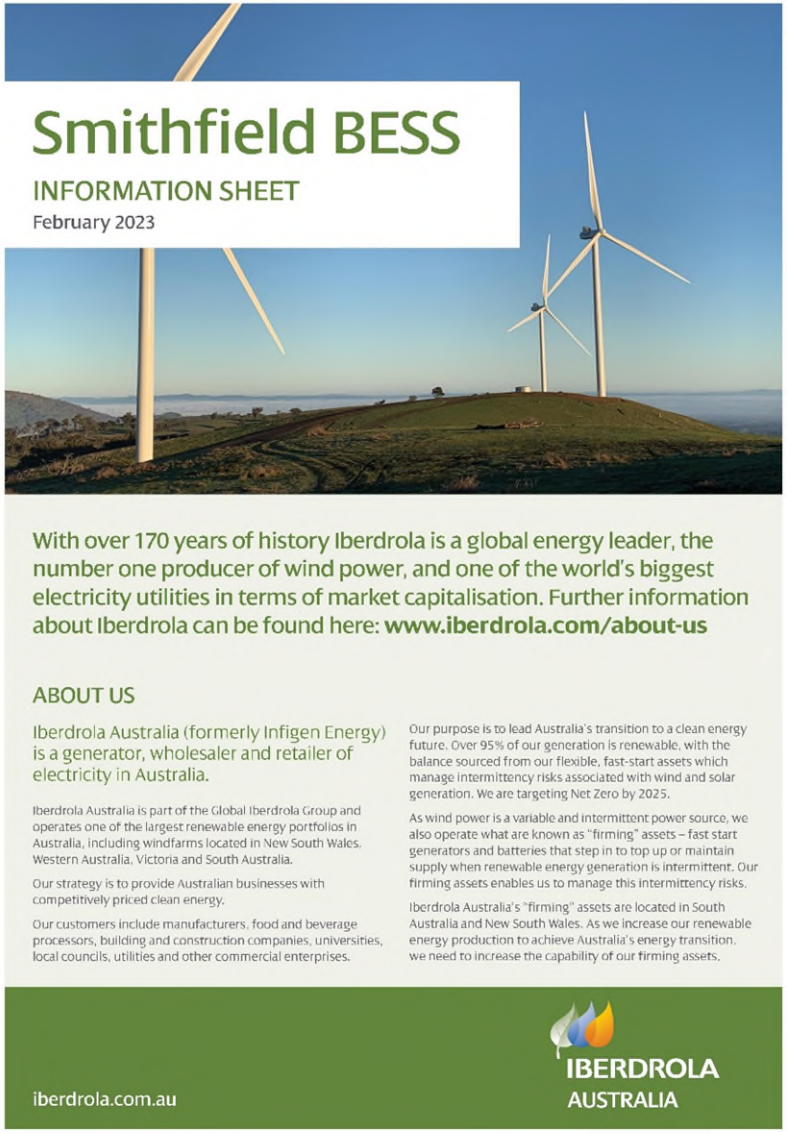
Opportunities for Involvement

If you, or anyone you know, is interested in future supplier and/or contractor opportunities throughout the construction and/or operations phase of the battery, they may register their interest by sending an email to smithfieldbattery@iberdrola.com.au.

We look forward to hearing from you and keeping you informed of any developments regarding this project.

Sincerely,

Julien Tissandier
Project Manager for Smithfield Battery Project



Smithfield BESS

INFORMATION SHEET

February 2023

With over 170 years of history Iberdrola is a global energy leader, the number one producer of wind power, and one of the world's biggest electricity utilities in terms of market capitalisation. Further information about Iberdrola can be found here: **www.iberdrola.com/about-us**

ABOUT US

Iberdrola Australia (formerly Infigen Energy) is a generator, wholesaler and retailer of electricity in Australia.

Iberdrola Australia is part of the Global Iberdrola Group and operates one of the largest renewable energy portfolios in Australia, including windfarms located in New South Wales, Western Australia, Victoria and South Australia.

Our strategy is to provide Australian businesses with competitively priced clean energy.

Our customers include manufacturers, food and beverage processors, building and construction companies, universities, local councils, utilities and other commercial enterprises.

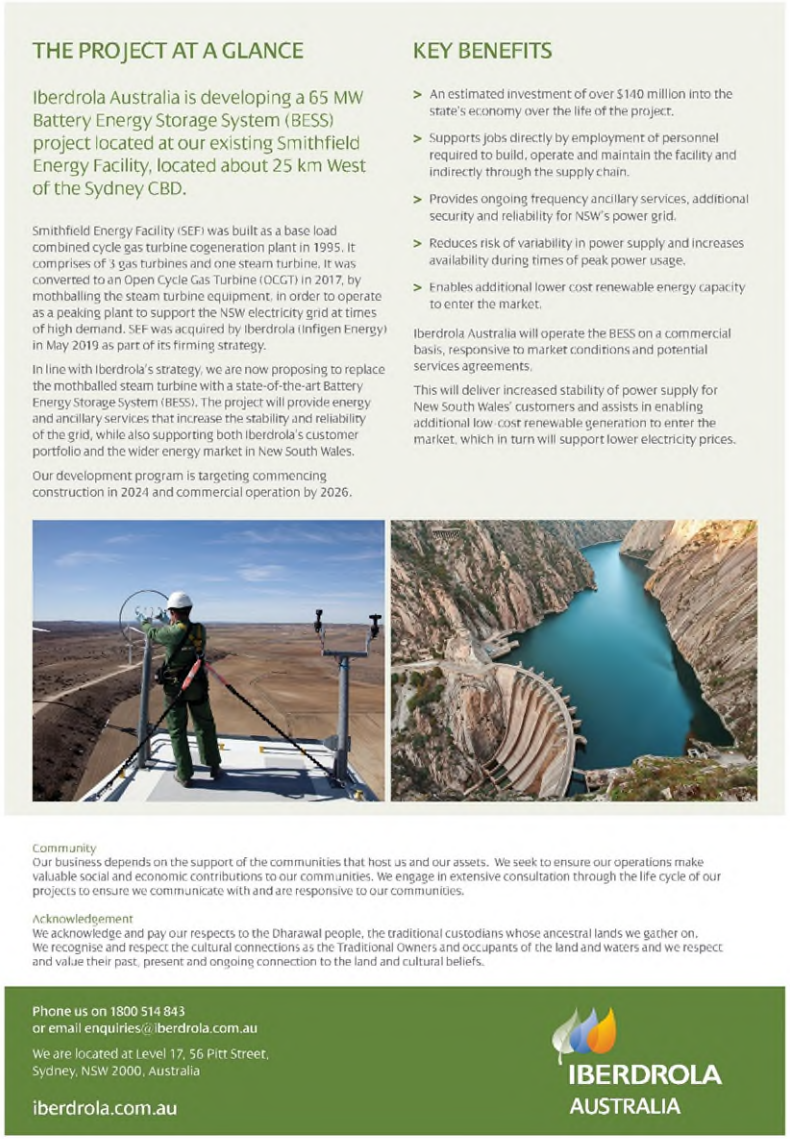
Our purpose is to lead Australia's transition to a clean energy future. Over 95% of our generation is renewable, with the balance sourced from our flexible, fast-start assets which manage intermittency risks associated with wind and solar generation. We are targeting Net Zero by 2025.

As wind power is a variable and intermittent power source, we also operate what are known as "firming" assets – fast start generators and batteries that step in to top up or maintain supply when renewable energy generation is intermittent. Our firming assets enables us to manage this intermittency risks.

Iberdrola Australia's "firming" assets are located in South Australia and New South Wales. As we increase our renewable energy production to achieve Australia's energy transition, we need to increase the capability of our firming assets.

iberdrola.com.au

IBERDROLA AUSTRALIA



THE PROJECT AT A GLANCE

Iberdrola Australia is developing a 65 MW Battery Energy Storage System (BESS) project located at our existing Smithfield Energy Facility, located about 25 km West of the Sydney CBD.

Smithfield Energy Facility (SEF) was built as a base load combined cycle gas turbine cogeneration plant in 1995. It comprises of 3 gas turbines and one steam turbine. It was converted to an Open Cycle Gas Turbine (OCGT) in 2017, by mothballing the steam turbine equipment, in order to operate as a peaking plant to support the NSW electricity grid at times of high demand. SEF was acquired by Iberdrola (Infigen Energy) in May 2019 as part of its firming strategy.

In line with Iberdrola's strategy, we are now proposing to replace the mothballed steam turbine with a state-of-the-art Battery Energy Storage System (BESS). The project will provide energy and ancillary services that increase the stability and reliability of the grid, while also supporting both Iberdrola's customer portfolio and the wider energy market in New South Wales.

Our development program is targeting commencing construction in 2024 and commercial operation by 2026.

KEY BENEFITS

- An estimated investment of over $140 million into the state's economy over the life of the project.
- Supports jobs directly by employment of personnel required to build, operate and maintain the facility and indirectly through the supply chain.
- Provides ongoing frequency ancillary services, additional security and reliability for NSW's power grid.
- Reduces risk of variability in power supply and increases availability during times of peak power usage.
- Enables additional lower cost renewable energy capacity to enter the market.

Iberdrola Australia will operate the BESS on a commercial basis, responsive to market conditions and potential services agreements.

This will deliver increased stability of power supply for New South Wales' customers and assists in enabling additional low-cost renewable generation to enter the market, which in turn will support lower electricity prices.

Community

Our business depends on the support of the communities that host us and our assets. We seek to ensure our operations make valuable social and economic contributions to our communities. We engage in extensive consultation through the life cycle of our projects to ensure we communicate with and are responsive to our communities.

Acknowledgement

We acknowledge and pay our respects to the Dharawal people, the traditional custodians whose ancestral lands we gather on. We recognise and respect the cultural connections as the Traditional Owners and occupants of the land and waters and we respect and value their past, present and ongoing connection to the land and cultural beliefs.

Phone us on 1800 514 843
or email enquiries@iberdrola.com.au

We are located at Level 17, 56 Pitt Street, Sydney, NSW 2000, Australia

iberdrola.com.au

IBERDROLA AUSTRALIA

Figure 6-1: Distributed Project newsletters

6.5 Consultation outcomes

A summary of the consultation activities carried out, the key aspects discussed, and how they been considered within this EIS and the development of the Project, is provided in Table 6-4.

Table 6-4: Consultation outcomes

Stakeholder	Consultation activities	Consultation outcomes	Action taken
Government			
DPE	• A scoping meeting was held (via teleconference) to provide an overview of the Project on 18 November 2022. • A scoping meeting was held (via teleconference) to confirm planning pathway provide an update of the Project on 28 April 2023. • Phone and email correspondence has occurred throughout the development of the EIS. • Consultation with other departments within DPE (namely the Hazards department and Biodiversity and Conservation Division) was carried early in the Project via teleconference and the BDAR wavier application process.	• No additional specific feedback has been provided beyond the SEARs and pre-SEARs advice letters. • BDAR Waiver application granted and included in Appendix J.	• The SEARs and how these have been addressed are identified in Appendix A.
FRNSW	• Briefing letter to provide an overview of the Project, invite feedback and opportunity to meet during Scoping Report and the EIS on 8 February 2023 and 4 September 2023.	• FRNSW declined the opportunity to meet, noting that FRNSW would review and provide specific comment and recommendations on the finalised proposal via the Department of Planning Major Projects Portal. • FRNSW provided links to the following documents for consideration in project planning: - Access for fire brigade vehicles and firefighters (FRNSW, 2020) - Hazardous Industry Planning Advisory Paper (HIPAP) No. 1 - Industry Emergency Planning Guidelines - Emergency services information package and tactical fire plan.	• A PHA has been developed specifically address potential hazard and risks associated with the Project and is included in Appendix E. • The Fire Strategy Study is an identified mitigation measure for the Project.

Stakeholder	Consultation activities	Consultation outcomes	Action taken
		• FRNSW noted that a Fire Safety Study is generally recommended for BESS facilities such as this Project.	
EPA	• Briefing letter to provide an overview of the Project, invite feedback and opportunity to meet during Scoping Report and the EIS on 9 February 2023 and 21 August 2023. • A meeting was held (via teleconference) on 30 August to discuss the Project.	• EPA's key information requirements for the Project were an adequate assessment of air quality, water quality and noise. • During the meeting, EPA sought clarification about how the batteries would be disposed at the end of the Project, noting that lithium is a hazardous waste. • Discussed implication of the Project on EPL 5701.	• As assessment of air quality is provided in Chapter 16. • As assessment of water quality is provided in Appendix G. • As assessment of noise is provided in Appendix D. • As assessment of waste including decommissioning is provided in Chapter 14. • EPA would continue to be consulted regarding the timing and need to vary EPL 5701.
TfNSW	• Briefing letter to provide an overview of the Project, invite feedback and opportunity to meet during Scoping Report on 2 February 2023.	• Feedback identified a number of aspects to be addressed within the Traffic Impact Assessment (TIA) as part of the EIS application, particularly in relation to oversize and/or overmass vehicles.	• Table 1-2 of the TIA identifies how each TfNSW comment has been addressed. The TIA is included in Appendix C.
Cumberland City Council	• Briefing letter to provide an overview of the Project, invite feedback and opportunity to meet during Scoping Report and the EIS on 2 February 2023 and 9 August 2023. • A meeting was held (via teleconference) on 29 August to discuss the Project. • Email correspondence has occurred throughout the development of the EIS.	• During the meeting, Cumberland City Council Pre-SEARs comments were discussed and reviewed to better understand the context of these comments. • The two key requests from Cumberland City Council included: - Request that the EIS consider the implications of flooding on users / customers of the BESS, safety and the environment - Request that the EIS clarify how the BESS would interact / be managed with the SEF.	• Councils flood advice letter and flood model was obtained from council. This was reviewed as part of the Water Assessment in Appendix G. • The Water Impact Assessment considers the implications of the Project on flooding. • An overview of how the Project would interact with the SEF is provided in Section 2.3. • Cumberland City Council pre-SEARs comments and how these have been addressed is included in Table 6-5.
Utility companies			

Stakeholder	Consultation activities	Consultation outcomes	Action taken
Jemena	• Briefing letter to provide an overview of the Project, invite feedback and opportunity to meet during Scoping Report and the EIS on 22 February 2023 and 21 August 2023. • A meeting was held (via teleconference) on 6 March 2023 and a follow up phone call occurred on 6 September to discuss the Project and specifically the nearby eastern gas pipeline as required by the SEARs . • Email correspondence has occurred throughout the development of the EIS.	• Jemena accepts the proposed development subject to a safety management study being undertaken during detailed design and prior to construction.	• A PHA has been developed specifically to address potential hazard and risks associated with the Project and is included in Appendix E. • The Safety Management Study is an identified mitigation measure for the Project.
Adjacent Landowners			
Visy	• Phone call 13 July 2023 and follow up email to provide overview of Project, approval detail and target submission dates. • Face to face meeting and detailed presentation 10 August 2023 to outline Project in more detail. • Weekly phone calls during August and September to provide Project developments land-owner consent, potential construction laydown areas and access.	• Requested further information regarding contamination potential and management of unexpected contamination finds.	• Contamination will be managed in accordance with lease agreement. As assessment of contamination is provided in Appendix F. • Land owners consent will be obtained prior to lodgement.
Kingspan	• Phone call 13 July 2023 and follow up email to provide overview of Project, approval detail and target submission dates. • Face to face meeting and detailed presentation 30 August 2023 to outline the Project in more detail. • Regular phone calls were made through the month of September 2023.	• General support / endorsement for the Project subject to ongoing consultation, review of the EIS and implementation of mitigation measures.	• Consultation to continue, including detailed planning regarding construction compound laydown and access (refer Section 4.3.4).
Goodman	• Phone call 6 September and follow up email to provide overview of Project, approval detail and target submission dates.	• General support / endorsement for the Project subject to ongoing consultation.	• Consultation to continue based on feedback provided.

Stakeholder	Consultation activities	Consultation outcomes	Action taken
	• Phone call on 4 October to provide an update on design and clarity of submission timeframes.		
Other			
Wider community	• Door knock undertaken 30 August 2023 to residential properties within closest proximity to the Project (Cooper Crescent, Alt Street, Chisholm Street and Solo Crescent). • A Project information letter was distributed to 361 residential properties within 750 metres of the Project site on 5 September 2023. The letter, outlined in Figure 6-1, provided important information to residents informing the about the Project, the approval process, prospective key dates along with opportunities to provide feedback. • The Iberdrola company website, mailing list, email and phone are continually reviewed and updated to include details about the Smithfield BESS and key details regarding the development timeline and opportunities to provide feedback.	• Residents consulted were appreciative of being informed of the Project. Many residents contacted were neutral or in support of the Project. • Key concerns based on discussions with the community include additional impacts to traffic along major routes as well as noise. Out of the 361 letters distributed, three (3) residents registered their interest for ongoing project updates via one of several response methods outlined in the newsletter. • General support / endorsement for the Project subject to ongoing consultation, review of the EIS and implementation of mitigation measures.	• A detailed assessment of potential traffic and noise related impacts is provided in Appendix C and Appendix D. • All interested community stakeholders were emailed and added to a mailing list for all future Project updates.

Table 6-5: Cumberland City Council comments (Pre-SEARs advice letter dated 11 July 2023)

Feedback	Response
Planning The following SEPPs and any relevant clauses shall be addressed in any forthcoming application • B&C SEPP – Chapter 6 – Water Catchments. The site is located within the Georges River Catchment Area. Any forthcoming application shall ensure the proposal does not impact on water quality of the catchment area and demonstrate compliance with all relevant clauses of the SEPP. • R&H SEPP – Chapter 2 – Coastal Management.	• Consideration and discussion of State Environmental Planning Policies which are considered relevant to the Project are summarised in Table 5-2.

Feedback	Response
It is noted that Council's internal mapping system identifies the rear south portion of the site to be subject to Prospect Creek. • B&C SEPP • *State Environmental Planning Policy (Resources and Energy) 2021* • Planning Systems SEPP • T&I SEPP	
Planning *Cumberland LEP 2021* • The site is zoned E4 General Industrial under CLEP 2021. Any forthcoming application shall demonstrate permissible and zone objective compliance. • The site is identified as a flood control lot. Pre – flood advice letter shall be applied for from Council prior to assessment of any application. Any forthcoming application shall ensure compliance with the flood advice letter and Council's flood controls. Refer to engineering comments below. • The site identified as having Potential Moderate Salinity. This shall be addressed and identified in any future application.	• Consideration and discussion of the Cumberland LEP 2021 is included in Section 5.4, including zone objective compliance. • A flood advice letter was obtained, reviewed and considered as part of the Water Assessment in Appendix G • Groundwater is not expected to be encountered due to the limited depth of excavation. Works would be managed to ensure that there are no detrimental effects from salinity drainage patterns, soil stability or any surrounding properties.
Planning *Cumberland DCP 2021* • Parts D (Development in Industrial Zones) and Parts G (Miscellaneous Development Controls) shall be considered in the assessment of the development	• Consideration and discussion of the Cumberland LEP 2021 is included in Section 5.4, including the Cumberland DCP.
Noise and Acoustics Noise and vibration assessment for construction and operational activities including cumulative impacts to the area and any sensitive receiver impacts should be carried out as part of the application.	• A Noise and Vibration Impact Assessment has been developed specifically to address potential noise and vibration impacts in Appendix D.
EIS The EIS will be carried out at the design phase and should be submitted to Council for review and comment when completed. The EIS will contain: • Preliminary Hazard Analysis which will qualitatively discuss the potential operational risks of the Project with particular regard to the potential risk to people, property and the biophysical environment that may occur as a result of the accidental release of potential hazardous material and energy.	• A PHA has been developed specifically address potential hazard and risks associated with the Project and is included in Appendix E • A detailed description of the Project is included in Chapter 4 • Environmental impacts have been assessed in this EIS • Environmental management measure are summarised in Chapter 19 • Stakeholder feedback has been summarised in Chapter 6

Feedback	Response
• A detailed description of the Project including its components, construction activities and potential staging • A comprehensive assessment of the potential impacts on the key issues including a description of the existing environment, assessment of potential direct and indirect and construction, operation and staging impacts • Description of measures to be implemented to avoid, minimise, manage, mitigate, offset and/or monitor the potential impacts • Identify and address issues raised by stakeholders	
BESS The battery storage system would comprise modular units on pad mounted foundations, which are containerised. Each unit contains a number of battery pods strung together and connected to an inverter, which will convert the direct current from the batteries into alternating current and connect into the electricity grid. • Full diagram and location of the pod system recommended.	• A detailed description of the Project is included in Chapter 4 which outlines the location of the BESS facility and typical dimensions • The Proponent has not made a decision on the BESS OEM and as such a full diagram cannot be provided. The selection of the OEM is subject to commercial tendering and procurement processes and would ensure the Project is optimised in terms of yield and efficiency, within the parameters of the approval.
Cooling Towers The location of the large pad installation appears to be going located where the current cooling towers for the plant are currently located. A full demolition, management, and decommissioning plan will be required to ensure the sage removal of the old Water Cooling System will be removed. Will a new water cooling System be required as part of the energy plant for future use? If yes, full details of the new system will be required	The demolition of the cooling towers has been addressed via a separate approval (DA 94/165 Modification 3) which was submitted to DPE for approval. The modification is for the following scope of works: • Removal of redundant CCGT infrastructure • Construction and operation of a new cooling system • Removing the ability for the SEF to operate in CCGT mode.
Contamination / Remediation Demolition and earthworks will be required as part of the project so a preliminary site investigation (PSI) and Hazardous Material Survey would be recommended	
Air Quality / Water Protection / General Environmental Prospect Creek is located nearby to the development. When the EIS is prepared it should include any potential impacts to the creek.	• Potential impacts to Prospect Creek have been assessed as part of the Water Assessment in Appendix G
POEO Act – Scheduled 1 Activities	• Noted. Consultation with EPA is ongoing regarding the timing and need to vary the existing EPL 5701

Feedback	Response
The activities listed in Schedule 1 to the Act (broadly, activities with potentially significant environmental impacts) require an EPL. The operation of the BESS does not constitute any of the scheduled activities and therefore does not require an EPL	
Recommendations Council do not have any objections to the project, however as we have only received the scoping report more details in the development will be required as they are prepared. It is recommended that: • The EIS be submitted to Council for review and comment once prepared.	• This EIS
• A noise and vibration assessment should be carried out from a suitably qualified acoustic consultant with the proposal. The acoustic assessment must demonstrate that the development will comply with the NSW EPA's Noise Policy for Industry (NPfI) and any relevant noise requirements of Council's DCP. The report should give consideration to all noise impacts on any sensitive receivers in the vicinity of the proposed development that may be caused by the development including, but not limited to, mechanical plant, traffic noise, communal areas, operational noise from the site. The report must also give recommendations where noise attenuation measures are required.	• A Noise and Vibration Impact Assessment (NVIA) has been developed specifically to address potential noise and vibration impacts in Appendix D
• A PSI (Stage 1) report should be prepared to accompany the development application with respect of the suitability of the site for the proposed site. The report shall be prepared by a suitably qualified consultant in accordance with relevant EPA guidelines. Please be advised that depending on the findings of the PSI (Stage 1) report, it may be necessary to conduct further contamination investigations and furnish Council with more reports namely a Detailed Site Contamination Investigation (Stage 2) Report and/or Remediation Action Plan and/or Site Audit Statement. If this is required, it is recommended to submit all reports with the application, so the assessment of the development application (DA) is not delayed.	• A PSI has been prepared to review contamination risks and is provided in Appendix F
• A Hazardous Materials Survey Report should be prepared by a suitably qualified person (such as a certified Occupational Hygienist) The report must identify and record the type, location and extent of any hazardous materials on the site and make recommendations as to the safe management and/or removal to ensure the site is safe for demolition, construction and future use/occupation.	The demolition of the cooling towers has been addressed via a separate approval (DA 94/165 Modification 3) which was submitted to DPE for approval. The modification is for the following scope of works: • Removal of redundant CCGT infrastructure • Construction and operation of a new cooling system • Removing the ability for the SEF to operate in OCGT mode.
• A full demolition, management, and decommissioning plan will be required to ensure the sage removal of the old Water Colling System will be removed. - Will a new water-cooling System be required as part of the energy plant for future use? If yes, full details of the new system will be required	

Feedback	Response
Flooding • Subject site is a flood control lot. It appears development is located within Medium Flood Risk precinct. Critical utilities are not acceptable within the Medium Flood Risk precincts. • In this regard, flood advice letter shall be obtained from Council and flood risk shall be verified. • Development shall comply with the flood advice letter and Council's Flood Risk Management Policy. Supporting documents shall be submitted for assessment. • It appears, the proposed development may not be suitable within the subject site as critical utilities are not acceptable within Medium Flood Risk precinct. • It should be noted access to the site may be affected during the 1% AEP flooding	• Councils flood advice letter and flood model was obtained from council. This was reviewed and is addressed within the Water Assessment in Appendix G. • Consultation was undertaken with Cumberland City Council to discuss flooding on 9 August 2023. During the meeting, Cumberland City Council noted an exemption may be plausible given that the existing context / approved operations at the site (i.e. an existing electricity generating asset – the SEF) which would be reviewed upon receipt of the EIS.
Stormwater Stormwater plan has not been submitted. Stormwater runoff from the entire site shall be discharged by gravity system to street gutter or Council's system. Existing and proposed stormwater details shall be provided. • Onsite Stormwater Detention (OSD) shall be provided as part of the proposal. The details shall be prepared by a suitably qualified person and must be in accordance with Council's DCP and the Upper Parramatta River Catchment Trust "On-Site Detention Handbook. In this regard: - Stormwater plan shall be prepared by suitably qualified hydraulic engineer. - OSD shall be located outside the building floor areas. - OSD calculations, cross section discharge control pit and cross section of the OSD tank shall be submitted. • Overland flow from adjacent properties shall be maintained. Allowances shall be made for surface runoff from adjacent properties, and to retain existing surface flow path systems through the site. • Stormwater runoff from the manoeuvring area including access ways will have to undergo some form of standard primary treatment/separation prior to disposal into existing	• Details of the existing stormwater system at the SEF has been described as part of the Water Assessment in Appendix G. Given the Project would not increase the amount of impervious surfaces, the existing stormwater system was identified has been suitable for the development.
Parking/Access • TIA report shall be submitted to ensure proposed development will not have adverse impact on the street traffic and parking. The traffic impact assessment report shall address the impacts of the proposed developments. These should include, but not limited to, queuing, parking, traffic generation, entry and exit. • Parking space numbers are provided as per Council's DCP requirements. • Details of the service vehicle and loading arrangement shall be provided.	• A TIA has been prepared to address potential traffic and transport impacts • The development would be operated remotely. As such no change to the number of existing car parking numbers are proposed • The SEF is owned by the Proponent of this Project (Iberdrola) and is also largely operated remotely

Feedback	Response
• It appears site is used by other tenancy. Proposed development shall not interfere with the approved existing parking, loading, and access arrangements. In this regard, approved details for the existing use shall be submitted. • The design of the driveway, car parking spaces, circulation aisles and sight distance shall comply with Council's DCP and Australian Standards (i.e. AS2890.1 and AS2890.6) if not covered by the DCP.	• No alterations are proposed to the driveway, carparking, and internal road network of the SEF.
Waste A Waste Management Plan has not been submitted for pre-assessment, however, the battery storage facility will not generate a significant amount of waste materials. The management of any small amounts of waste can easily be managed on site and is deemed overall satisfactory	Potential waste impacts have been assessed in Chapter 14.

6.6 Ongoing engagement

6.6.1 Public exhibition of the EIS

Public exhibition of the EIS will be for a minimum of 28 days as stated in the EP&A Act. Advertisements will be placed to advise of the public exhibition and where the EIS can be viewed, and details of proposed community consultation activities and information sessions.

Consultation activities during public exhibition of the EIS may include:

- Community information sessions
- Newsletter letterbox drop and email newsletters
- Information on project webpage
- Newspaper advertising
- Information available at local council offices
- Stakeholder meetings
- Local business engagement
- Government stakeholder engagement.

The extent and form of this consultation would be determined prior to the exhibition of the EIS.

6.6.2 Consultation during construction/operation

Iberdrola would continue to carry out consultation after the completion of the planning phase of the Project and into its construction and operational phases. Ongoing consultation would include, but not be limited to:

- Pre-commencement “job-fairs” to source local labour, suppliers and subcontractors and maximise local content
- Consultation in accordance with statutory requirements
- Ongoing consultation with key stakeholders, local council and other government agencies
- Provision of regular updates to nearby businesses and the community.

7 Environmental risk assessment

Key environmental issues or risks identified by the SEARs (Appendix A) were reviewed as part of an Environmental Risk Assessment (ERA). The purpose of the ERA was to identify the level of risk associated with the Project before and after the application of the mitigation measures outlined in Chapter 1, and to determine the level of the residual risks. Risks were therefore provided an 'initial' risk ranking and a 'residual' risk ranking, assuming effective implementation of the proposed mitigation measures.

7.1 Environmental risk screening methodology

The ERA was undertaken in accordance with the principles of the *Australian and New Zealand standard AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines*. This involved ranking the risks by identifying the consequence of the impact and the likelihood of each impact occurring. The following rules guided the risk analysis process:

- Risk ratings were considered at the broader issue level only (for example construction noise and vibration, rather than noise from each specific construction activity separate to vibration)
- Industry standard environmental management practice was considered in determining risk ratings, however project-specific mitigation (which would depend on the outcome of future environmental assessments) was not applied.

The first step in the risk analysis involved the identification of the consequence, should an impact occur, followed by identification of the likelihood of the impact occurring. The definitions of the consequences used are provided in Table 7-1 and the definitions of likelihood are provided in Table 7-2. The risk rating was then determined by the consequence and likelihood to identify the level of risk as shown in the matrix in Table 7-3.

Table 7-1: Consequence definitions

Consequence Level	Environmental	Community	Time Frame
Catastrophic	Irreversible large-scale environmental, social or economic impacts	Extended substantial disruptions and impacts to stakeholder(s).	Long-term Greater than 12 months
Severe	Potentially irreversible impacts, extensive remediation required	Severe disruptions or long-term impacts to stakeholder(s).	Long-term Between 6 to 12 months
Major	Potentially irreversible impacts, considerable remediation required	Major impacts or disruptions to stakeholder(s)	Medium-term Between 3 and 6 months
Moderate	Reversable and/or well-contained impacts, minor remedial actions required	Moderate impacts or disruptions to stakeholder(s)	Medium-term Between 1 and 3 months
Minor	Reversible or minor impacts that are within environmental regulatory limits and within site boundaries	Minor or short-term impacts on stakeholder(s)	Short-term Less than 1 month
Insignificant	No appreciable or noticeable changes to the environment	Negligible impact on environment or stakeholder(s)	Short term Hours

Table 7-2: Likelihood definitions

Likelihood	Definition	Probability
Almost certain	Expected to occur frequently during time of activity or project (10 or more times per year)	>90%
Likely	Expected to occur occasionally during time of activity or project (1 to 10 times per year)	75% to 90%
Possible	More likely to occur than not occur during time of activity or project (once per year)	50% to 75%
Unlikely	More likely to not occur than occur during time of activity or project (once every 1 to 10 years)	25% to 50%
Rare	Not expected to occur during the time of the activity or project (once every 10 to 100 years)	10% to 25%
Almost unprecedented	Not expected to ever occur during time of activity or project (less than once every 100 years)	<10%

Table 7-3: Risk analysis categories and criteria for risk rating

Likelihood	Consequence					
	Insignificant	Minor	Moderate	Major	Severe	Catastrophic
Almost certain	Moderate	High	High	Very High	Very High	Very High
Likely	Moderate	Moderate	High	High	Very High	Very High
Possible	Low	Moderate	Moderate	High	High	Very High
Unlikely	Low	Low	Moderate	Moderate	High	High
Rare	Very Low	Low	Low	Moderate	Moderate	High
Almost unprecedented	Very Low	Very Low	Low	Low	Moderate	Moderate

7.2 Risk analysis and assessment

The ERA was carried out using the framework described above and is presented in Table 7-4.

The risk analysis identifies an initial risk rating for each of the environmental issues and provides a description of how the risk ratings were derived.

Further details regarding the existing environment and potential impacts associated with each environmental issue are provided in Chapter 8 to Chapter 18.

Table 7-4: Outcomes of environmental risk assessment

Environmental Aspect	Initial risk identified	Initial risk rating (pre-mitigation)	Mitigation	Residual risk	EIS reference
Traffic, transport and access (construction)	Construction traffic and transport impacts on the local road network	Moderate	Implementation of traffic control measures will help mitigate traffic and transport impacts. Traffic and transport mitigation measures are outlined in Chapter 8 A Construction Traffic Management Plan (CTMP) will be developed prior to construction as part of the CEMP for the Project.	Low	Chapter 8 Appendix C Traffic Impact Assessment
Traffic, transport and access (operation)	Operational traffic and transport impact on surrounding network	Very Low	Traffic and transport mitigation measures are outlined in Chapter 8. Given the negligible impact of traffic from the Project, no Project specific operational traffic measures are considered to be required.	Very Low	Chapter 8 Appendix C Traffic Impact Assessment
Noise and vibration (construction)	Construction noise and vibration impacts on sensitive receivers	Moderate	A Construction Noise Management Plan (CNMP) will be developed prior to construction as part of the CEMP for the Project and implemented during construction.	Low	Chapter 9 Appendix D Noise and Vibration Assessment
Noise and vibration (operation)	Operational noise and vibration impacts on sensitive receivers	Moderate	The Noise and Vibration Assessment concluded that the proposed development does not significantly impact the existing environment and the site is deemed suitable for the proposed use. The final layout (detailed design) will continue to be refined in the context of the selected OEM to meet the predicted noise levels described in the Noise and Vibration Assessment.	Low	Chapter 9 Appendix D Noise and Vibration Assessment
Hazards and risk (construction)	Accidental release of chemicals, fuels and materials during construction	Moderate	The CEMP prepared for the Project would include procedures and measures for managing accidental spills during operation.	Low	Chapter 10 Appendix E Preliminary Hazard Analysis
Hazards and risk (operation)	Thermal runaway, release of energy (arc flash) and generation of explosive gas from lithium-ion batteries during operation causing fire	High	The PHA concluded that providing recommendations are implemented (identified in Chapter 10 and Appendix E), the resulting consequences from identified BESS events are not expected to have significant off-site impacts. Equipment and systems would be designed and tested to comply with relevant international and/or Australian standards (e.g., AS 5139) and guidelines. Appropriate fault detection and safety shut-off protocols will be developed for operation. All fire safety systems would be detailed in a Fire Safety Study prepared in consultation with Fire and Rescue NSW	Low	Chapter 10 Appendix E Preliminary Hazard Analysis
Hazards and risk (operation)	Unauthorised access/trespasser, lightning, water ingress	Moderate	There is existing fencing around the SEF as well as appropriate security measures (e.g., locked gates, CCTV). Additional fencing and hazard/danger signage would be installed around the BESS. The BESS would be located above the 1% AEP.	Low	Chapter 10 Appendix E Preliminary Hazard

Environmental Aspect	Initial risk identified	Initial risk rating (pre-mitigation)	Mitigation	Residual risk	EIS reference
Hazards and risk (operation)	Exposure to Electromagnetic Fields	Moderate	Exposure to EMF (specifically magnetic fields) from electrical equipment would be localised and the strength of the field attenuates rapidly with distance. The exposure to EMF to personnel onsite will be minimised due to the transient nature of occupation of the site during operation. Incidental shielding (i.e., the BESS enclosure) and warning signs would be placed within the site and surrounds. Additionally, fencing around the project boundary would limit the exposure to EMF for staff and the general public.	Low	Chapter 10 Appendix E Preliminary Hazard
Soils and contamination (construction)	Potential to encounter contaminated soils during construction Contamination of soils caused by spills and leaks during construction	Low	A detailed Erosion and Sediment Control Plan (ESCP) as part of the CEMP, would be prepared in accordance with *Managing Urban Stormwater – Soils and Construction, Volume 2D* (DECC, 2004) An Unexpected Finds Protocol would also be included in the CEMP to manage any disturbance of material that is odorous, stained or containing anthropogenic materials, in the event these are encountered during construction.	Low	Chapter 11 Appendix F Preliminary Site Investigation Appendix G Water Impact Assessment
Soils and contamination (operation)	Contamination of soils caused by spills and leaks during operation	Low	The OEMP would include an Incident Response Plan and will specify the procedure to be followed in the event of a spill, including the notification requirements and the use of absorbent material to contain spills.	Very Low	Chapter 11
Water Quality (construction)	Off-site impacts to water quality	Low	Given the temporary nature of the proposed construction works and implementation of erosion and sediment control features, the impacts to surface water are considered minor. Any potential minor impact can be adequately controlled and further minimised through the implementation of the CEMP.	Very Low	Chapter 12 Appendix G Water Impact Assessment
Water Quality (operation)	Monitoring and maintenance of surface water quality measures	Low	The OEMP would include a management, maintenance and cleaning schedule to ensure that stormwater management system devices are regularly inspected and cleaned.	Very Low	Chapter 12 Appendix G Water Impact Assessment
Water Quantity (operation)	Flooding impacts from the development	Moderate	The BESS would be located above the 1% AEP.	Low	Chapter 12 Appendix G Water Impact Assessment
Waste Management (construction)	Inappropriate management of waste during construction	Moderate	A Waste Management Plan would be prepared and implemented as part of the CEMP detailing appropriate procedures for waste management in accordance with the waste management hierarchy.	Low	Chapter 14

Environmental Aspect	Initial risk identified	Initial risk rating (pre-mitigation)	Mitigation	Residual risk	EIS reference
			Wastes would be appropriately transported, stored and handled in accordance with NSW EPA waste classification and in a manner that prevents pollution of the surrounding environment.		
Waste Management (operation)	Inappropriate management of waste during operation	Low	The BESS units have a life span of 15-20 years. During this time various components of the BESS may require maintenance, and / or replacement. Battery replacement and maintenance parts / materials would be managed in accordance with an operational Waste Management Plan which would be prepared as part of the OEMP.	Low	Chapter 14
Visual Amenity (construction)	Construction (temporary) impact on visual landscape on sensitive receivers	Low	The Project Site is located within an industrial area with a mix of heavy and light industrial land use. The nearest residential receiver is located approximately 400 metres south of the Project Site Given the low-rise nature of construction works and surrounding industrial land uses, it is unlikely that these works would be overly intrusive and visual impacts would be localised and temporary in nature	Low	Chapter 15
Visual Amenity (operation)	Long-term impact on visual landscape on sensitive receivers	Low	The design of the BESS would consider a materials colour palette that integrates with the surrounding industrial nature of the site.	Very Low	Chapter 15
Air quality (construction)	Impacts on local air quality from construction activities, including dust generation from exposed surfaces, use of construction plant and emissions from machinery and vehicles	Low	A CEMP would be prepared and implemented to address the management of environmental issues outlined in this EIS including air quality. Reasonable and feasible dust suppression measures during will be implemented during construction (e.g., water tanks or sprinklers) to minimise fugitive dust emissions. Additionally, all plant and equipment will be maintained in accordance with manufacturers specifications and would comply with relevant vehicle emission standards, where applicable.	Very Low	Chapter 16
Air quality (operation)	Impacts on local air quality from operation of the Project	Very Low	Operation of the BESS would not result in any emission of particulates or other pollutants. Movement of staff vehicles will be minimal. No mitigation measures have been identified as it is unlikely there would be any operational air quality impacts.	Very Low	Chapter 16
Socio-economic (construction)	Amenity impacts resulting from noise, traffic, visual and air quality during construction	Moderate	A complaints contact number and email will be established for the duration of construction and a community complaints register will be maintained. Any complaints received from the community or other stakeholders will be appropriately investigated. Ongoing engagement would continue with stakeholders as outlined in Section 6.6.2, in accordance with the CEMP.	Low	Section 13.1 (Social) Appendix H Social Impact Assessment

Environmental Aspect	Initial risk identified	Initial risk rating (pre-mitigation)	Mitigation	Residual risk	EIS reference
Socio-economic (operation)	Amenity impacts (including noise and traffic) during operation	Moderate	The OEMP would include measures to engage with stakeholders and to manage and respond to feedback received during the operation.	Low	Section 13.1 (Social) Appendix H Social Impact Assessment
Biodiversity	Construction or operational impact to flora and fauna	Very Low	Based on the ecological field inspections and database reviews, it was concluded that the Project would not have any significant impacts on biodiversity values. A BDAR waiver was granted by the Planning Secretary on 20 July 2023 and has been provided in Appendix H.	Very Low	Chapter 17 Appendix J BDAR Waiver
Heritage (Aboriginal and Non-Aboriginal))	Construction or operational impact to heritage	Very Low	No non-Indigenous items were identified to occur on the Project Site or surrounding properties according to the Cumberland LEP or the NSW heritage register. A basic search of the AHIMS register on 23 January 2023 identified no Aboriginal heritage sites within 200m buffer of the site. Given the developed nature of the Proposal Site, the potential for Aboriginal heritage to be encountered is low.	Very Low	Chapter 17
Bushfire	Bushfire impacting on construction or operational infrastructure within the Project Site	Low	The Project Site is not located within a designated bushfire prone area.	Very Low	Chapter 17
Cumulative impacts (construction and operation)	Cumulative construction impacts at sensitive receivers	Moderate	Existing background levels, incorporating impacts from existing operations at nearby facilities, have been taken into consideration for each of the key assessment areas within the EIS including traffic and transport, and noise and vibration. As such, the operational assessments presented in the EIS can be considered to represent a 'cumulative' assessment of the Project with existing surrounding operations.	Low	Chapter 18

8 Traffic and Transport

This chapter provides a summary of the potential traffic and transport impacts of the Project. Arcadis has undertaken an assessment of the potential traffic, transport and access impacts associated with the Project to address the SEARs issued by DPE. The TIA for the Project is provided in Appendix C of this EIS. Appendix A provides a summary of the relevant SEARs which relate to traffic and where these have been addressed in this EIS.

8.1 Methodology

8.1.1 Government plans, policies, and guidelines

The TIA was prepared with reference to the following plans/policies/guidelines:

- *Guide to Traffic Management – Part 3: Traffic Studies and Analysis* (Austroads 2020)
- *Guide to Traffic Management – Part 12: Integrated Transport Assessments for Developments* (Austroads 2020) and the complementary Supplement (Roads and Maritime Services (RMS) 2013).

8.1.2 Desktop assessment

The desktop assessment included the following tasks:

- Review of traffic infrastructure and services in proximity to the Project Site
- Determine the peak hours of network activity
- Undertake SIDRA 9 intersection modelling for the intersections of interest based on the current traffic volumes and intersection configuration
- Quantify the vehicle trips associated with the project (construction activity only)
- Determine the background traffic growth in proximity to the Project Site
- Undertake SIDRA 9 modelling in a construction horizon year accounting for the expected traffic volumes.

8.1.3 Traffic survey

Traffic count surveys were conducted to determine the existing traffic volumes and turning movements at the intersection of Cumberland Highway, Long Street, and Herbert Place. The survey data was collected for 6am to 10pm on Thursday 1st June 2023.

8.1.4 Background traffic growth and cumulative impacts

8.1.4.1 Growth rate

To assess impacts of the Project in future years, the future background traffic volumes have been established using a 0.4% annual traffic growth rate. The linear growth rate was sourced from the TfNSW Traffic Volume Viewer and determined using 2008 and 2018 annual average daily traffic (AADT) volumes from a traffic detector located on Cumberland Highway (Station 66248).

8.1.4.2 Nearby Projects

A search of the nearby council and State Significant Projects was undertaken to identify projects in proximity to the Project Site which could contribute to cumulative traffic impacts over and above background traffic growth (refer to Chapter 18). The search identified the Smithfield Recycling Centre as a nearby project.

The EIS for the Smithfield Recycling Centre (SSD-19425495) (MRA Consulting Group, 2022) indicates that the proposed development seeks to use an existing warehouse to receive up to 150,000 tonnes per annum of domestic and commercial recyclable materials. The recycling centre would then sort these materials into categories for transportation to dedicated reprocessing facilities. The EIS indicates that:

- Construction is anticipated to take around 4 months. The site would be accessed during construction hours of 7am to 6pm weekdays and 7am to 1 pm on Saturdays. It would be expected that approximately 30 light vehicles and 2 trucks would access the site daily for construction and installation works
- During operations, the total number of vehicular movements (vehicles x 2) is 190 truck movement per day, 72 passenger vehicle movement per day and 4 visitor vehicle movement per day. The maximum number of trucks would occur in the late morning, between 11 am and 12 am
- A total of 26 shift workers for the SRC will arrive and depart at shift change over times which occur between 3:45am to 4:15am and between 3:45pm and 4:15pm
- Eight administrative staff are assumed to arrive between 7:30am and 8:30am and leave between 4:45pm and 5:45pm
- All arriving vehicles will be approaching from the east and departing vehicles will travel west towards the intersection of Cumberland Highway and Herbert Place.

8.1.4.3 Cumulative impact assumptions

For the purposes of TIA, it has been assumed that:

- The worst case cumulative scenario would be construction of the Project and operation of the Smithfield Recycling Centre. As such Smithfield Recycling Centre generated movements have been included in the background traffic volumes in the assessment of the 2024 construction year scenarios
- There will be a 0.4% per cent annual growth rate in traffic on Warren Road / Cumberland Highway / Herbert Place.

8.1.5 Modelling

The performance of an existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. The criteria for evaluating the operational performance of intersections are provided in the Guide to Traffic Generating Developments (RMS 2002). The criteria for evaluating the operational performance of intersections are based on a qualitative measure (i.e., Level of Service – A to F (LoS A to LoS F)), which is applied to each band of average vehicle delay.

SIDRA 9 intersection modelling software was used to determine the current intersection level of performance given the existing intersection layouts and signal phasing informed by Sydney Coordinated Adaptive Traffic System data that was purchased from TfNSW.

The base SIDRA model was calibrated based on the existing intersection geometry (lane, median widths and pedestrian crossing distances), gradient, vehicle speeds, lane utilisation, traffic composition and signal phasing and timing from the given SCATs data.

8.2 Existing environment

8.2.1 Road network

A summary of the key roads in proximity to the Project Site is provided below.

8.2.1.1 Herbert Place

Herbert Place is a two-way local road controlled by the Cumberland City Council. Herbert Place has one six-metre-wide lane in each direction which is separated by a three-metre median strip. No stopping is enforced on the northern side of Herbert Place whilst the southern side has no restrictions. Each lane is wide enough for vehicles to park adjacent to the kerb whilst other vehicles travel onwards. Herbert Place has an east-west orientation and intersects with Cumberland Highway to the west as a signalised intersection and terminates as a cul-de-sac to the east

Figure 8-1: Herbert Place, facing east (Source: Google Maps)

8.2.1.2 Cumberland Highway

Cumberland Highway is a two-way state road controlled by TfNSW. Cumberland Highway has three lanes on each carriageway, with no stopping enforced throughout the alignment. A clearway is enforced from 6.00am to 7.00pm Monday to Friday and from 8.00am to 8.00pm Saturday to Sunday. Cumberland Highway has a north-south orientation and intersects with Herbert Place and Long Street at a signalised intersection. A posted speed limit of 70 kilometres per hour is enforced. Footpaths are provided on both sides of Cumberland Highway.

Figure 8-2: Cumberland Highway, facing north (Source: Google Maps)

8.2.1.3 Long Street

Long Street is a two-way local road with one traffic lane and one parking lane in each direction. Long Street has an east-west alignment and intersects with Cumberland Highway to the east as a signalised intersection and Gipps Road to the west as a priority intersection. A posted speed limit of 60 kilometres per hour is enforced. Footpaths are provided on either side of the road.

Figure 8-3: Long Street, facing west (Source: Google Maps)

8.2.2 Heavy vehicle routes

Outputs from the TfNSW Restricted Access Vehicle (RAV) map (Figure 8-4) shows 26-metre B-double routes on:

- Herbert Place
- Cumberland Highway
- Long Street.

The data indicates that heavy vehicles can access/egress the Project Site from the greater Sydney network, including Port of Botany.

Figure 8-4: RAV Map

8.2.3 Crash analysis

Five-year crash data between 2018 and 2022 has been analysed to understand the severity of crashes located within the general vicinity of the Project site. The data is available from the NSW Centre for Road Safety which was provided by TfNSW.

Analysis of the data indicates that:

- Ten crashes were reported between 2018 and 2022 in the vicinity of the Project Site
- Six of the ten (60 per cent) crashes occurred at the intersection of Cumberland Highway and Long Street
- Six of the ten (60 per cent) crashes were rear ends
- Four of the ten crashes (40 per cent) were recorded to have resulted in 'minor/non-injury' and the remaining six crashes were recorded as 'non-casualty/towaway'.

The ten crashes that occurred within the vicinity of the Project site across the five-year period were considered to be minor in terms of crash severity.

8.2.4 Public and active transport

A summary of the existing public (rail and bus) and active (pedestrian and cycling) transport network surrounding the Project Site is provided in Table 8-1

Table 8-1: Existing public and active transport

Mode	Existing environment
Rail	No train stations are located within the vicinity of the Project Site. The closest train stations are Yennora Station and Guildford Station which are both located four kilometres from the Project Site to the southeast and east respectively.
Bus	Three bus stops located within walking distance of the Project Site including: • Stop Id 2164297, Warren Rd after Herbert Place • Stop Id 2164295, Warren Rd after Long St • Long Street at Tait Street.
Pedestrian	No footpath is provided on the southern side of Herbert Place with only a footpath provided on the northern side. Footpaths are provided on both sides of Cumberland Highway, with the western footpath being a shared path with bicycle riders. The shared path ends in the south at the intersection of Victoria Street and Cumberland Highway. The shared path continues north to connect to the M4 Cycleway. There are footpaths on both sides of Long Street. At the intersection of Cumberland Highway, Long Street, and Herbert Street, a signalised pedestrian crossing facility is provided on all legs of the intersection except on the southern leg.
Cycling	A shared path on the western side of Cumberland Highway is provided and has a north-south alignment. The shared path width varies across the alignment and can narrow to 1.5 metres. The shared path continues north to connect to the Lower Prospect Canal Reserve shared path. The shared path terminates at the intersection of Victoria Street and Cumberland Highway. The Prospect Creek Cycle Path runs parallel to Prospect Creek and provides an east-west connection. The cycle path connects to Prospect Reservoir in the west and to Yennora in the east.

8.2.5 Current traffic volumes

Analysis of the traffic count data indicates that the AM and PM (commuter) peak hour at the intersection of Cumberland Highway, Long Street, and Hebert Place are:

- AM peak: 7:30am to 8:30am
- PM peak: 4:15pm to 5:15pm.

The construction peak hours for the Project are:

- AM peak: 6am to 7am
- PM peak: 6pm to 7pm

The commuter peak data indicates that:

- Cumberland Highway is well traversed during both the AM and PM peak, with between 1,900 – 2,300 through movements in the northbound direction and 2,100 – 2,700 through movements in the southbound direction
- Two-way traffic volumes on Long Street range from 740 – 780 vehicles in the peak hours
- Two-way traffic volumes on Herbert Place range from 95 – 120 vehicles in the peak hours which is minimal.

The existing traffic for the construction peak hours indicates that:

- Cumberland Highway is well traversed during both the AM and PM peak, with between 1,500 –2,300 through movements in the northbound direction and 1,400 –2,200 through movements in the southbound direction
- Two-way traffic volumes on Long Street range from 300 –670 vehicles in the peak hours
- Two-way traffic volumes on Herbert Place range from 100 –180 vehicles in the peak hours which is minimal

The traffic survey data is provided in Appendix C.

8.3 Traffic generation

8.3.1 Construction

8.3.1.1 Light vehicles

It is anticipated that 30 light vehicles (two-way movements) would occur daily and are attributed to the construction work force entering and exiting the site. Workers are expected to arrive before the start of the construction working hours and leave afterwards, therefore workers will typically arrive between 6.00am to 7.00am and leave between 6.00pm and 7.00pm.

It is anticipated that most of the construction workforce will be located within the Greater Sydney Region. Whilst construction personnel can carpool to the Project Site, a conservative estimate of 30 light vehicles travelling to the site daily has been used in the assessment.

8.3.1.2 Heavy vehicles

Heavy vehicles will be used to move goods and other plant equipment to and from site. It is estimated that a maximum of 130 heavy vehicles (two-way movements) would occur within the construction program. A conservative estimate, 10 (two-way movements) heavy vehicles will be entering and exiting the site during the commuter AM and PM peak hours.

All heavy vehicles movements are anticipated to occur from origins within the Greater Sydney Region and to occur within the construction working hours.

Oversize/Overmass vehicles (OSOM)

No Oversize/Overmass (OSOM) vehicles are expected. However, this would be confirmed by the appointed construction contractor. In the event that OSOM is identified, the contractor would obtain Ministerial Orders, Class 1 National Notices or permits with the National Heavy Vehicle Regulator. Transportation routes would to be agreed upon, subject to the required size of the vehicles. Transportation routes would follow approved routes as outlined Figure 8-4.

Average traffic generation

Average trip generation for light and heavy vehicles would be less than the peak volumes described for the AM and PM peak periods above. This would include a greater proportion of vehicles arriving outside the AM and PM peak periods and would fluctuate throughout the Project construction program (between the civil works, battery delivery and commissioning stages).

8.3.2 Operation

Minimal vehicle movements are anticipated during operations. The Project will contribute to the employment of an additional employee at the SEF during operation, primarily for scheduled maintenance. A conservative peak estimate is that there would be up to 5 trips per day (5 in-bound and 5 out-bound), comprising staff vehicles and irregular heavy vehicle movements (as required for transporting replacement parts and equipment). Average volumes in relation to the Project are expected be one trip per day.

Operational traffic volumes (including decommissioning) will be significantly less than the project's construction traffic and would result in minimal impacts to the traffic volumes on the road network. As such, operational traffic impacts have not been further considered.

8.4 Potential impacts

8.4.1 Road network

Intersection traffic modelling, using the SIDRA 9 modelling software, has been undertaken for the following scenarios:

- A 'no-build' scenario, accounting for background traffic growth for the current year (2023)
- A 'no-build' scenario, accounting for background traffic growth for the construction year (2024)
- A 'build' scenario, accounting for the background traffic growth and the expected peak construction traffic associated with the project (2024) plus the traffic volume generated by the Smithfield Recycling Centre operation

Table 8-2 summarises the SIDRA intersection modelling results for the existing condition (2023), background traffic with and without development scenarios in 2024 (build year). The full SIDRA results including movement summaries, lane summaries and phasing summarises are presented in Appendix C.

Table 8-2: Intersection performance summary

Peak period	2023 Background traffic		2024 Background traffic without development		2024 Background traffic with development	
	DOS	LOS	DOS	LOS	DOS	LOS
Construction AM peak (6:00am to 7:00am)	0.787	LOS B	0.790	LOS B	0.793	LOS B
Commuter AM peak (7:30am to 8:30am)	0.808	LOS B	0.812	LOS B	0.813	LOS B
Commuter PM peak (4:15pm to 5:15pm)	0.881	LOS C	0.887	LOS C	0.888	LOS C
Construction PM peak (6:00pm to 7:00pm)	0.717	LOS B	0.722	LOS B	0.722	LOS B

The intersection performance results indicate that the study intersection performs satisfactorily in terms of DOS and LOS (i.e. DOS<0.90 and LOS D or better) in the existing conditions in both 2023 and 2024. The intersection is anticipated to experience minor increases in DOS and queue lengths in 2024 with the BESS development, which is considered to have a marginal impact on the intersection performance.

Therefore, no road intersection upgrades are warranted to offset the development traffic impacts at the study intersection. Traffic impacts due to the Project operation and construction phases have been assessed to be minor. On this basis, road upgrades, infrastructure works, or new roads would not be required for the development.

8.4.2 Access

No road access upgrades have been identified as being required to enable delivery and / or access to the Project Site. All vehicular access to the Project site required for construction and operation would be via Herbert Place. The largest vehicle anticipated is a 19-metre six-axle articulated heavy vehicle as advised by the Proponent to deliver plant equipment during the construction phase. The 19-metre vehicle is able to enter the Project Site without impacting any of the street furniture. The egress of the 19-metre vehicle requires the vehicle to reverse out onto the cul-de-sac as any other vehicular movements. Traffic management personnel are anticipated to facilitate the egress of the 19-metre vehicles through supervision to ensure public safety.

8.4.3 Impacts to public transport and active transport

The expected vehicle activity associated with the construction, operation, and decommissioning and rehabilitation of the project is expected to have a negligible impact on the active transport infrastructure in proximity to the Project Site.

No changes to existing bus operations are required to facilitate the construction, operation, or decommissioning and rehabilitation of the project.

8.4.4 Impacts to parking

8.4.4.1 Construction

During peak construction period, up to 30 workers are anticipated. As identified in Section 2.3, in recent years, the SEF has operated between 2% and 5% of the time each year with five staff onsite.

If not managed, parking could cause disruption and nuisance to the neighbouring businesses.

In order to mitigate this potential impact, the following hierarchy would be applied:

- Existing parking within the SEF would be utilised (capacity of around 20 light vehicles, five of which are used for current SEF staff)
- Car parking within the proposed construction compound (anticipated to be for 10 light vehicle)
- Car parking within neighbouring properties along Herbert Place, in consultation with neighbouring landowners

8.4.4.2 Operation

The car parking requirements for the Project are set out in the Cumberland Development Control Plan, (2021), specifically in Part G3, Section 3. Reference to the Table of General Parking Controls indicate that there is no applicable land use provided in the Cumberland Development Control Plan, (2021), specifically in Part G3, Section 3, for energy infrastructure.

The BESS would be operated remotely with a scheduled maintenance and inspection program. The existing workforce at the SEF would be available to manage the BESS (currently five staff onsite) as required. Existing parking within the SEF would be utilised which has a capacity of around 20 light vehicles would be sufficient for the Project and existing SEF activities.

8.5 Mitigation measures

Table 8-3 summarises the mitigation measures for managing traffic during construction and operation of the Project.

Table 8-3: Traffic and transport mitigation measures

ID	Mitigation Measures
Construction	
T1	Develop a construction traffic management plan (CTMP), prior to construction in consultation with the relevant road authority. Include, at a minimum, the following management measures: • Undertake consultation with the relevant road authorities and adjacent landowners during preparation of the CTMP. • A process for ongoing consultation with relevant authorities. • A process for managing OSOM deliveries. • Routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses. Secondary alternative construction route activities should be included, in the event of the primary route is blocked off by an emergency. • Identification of parking areas for the workforce to minimise impacts on sensitive land uses and businesses. • Implement measures to manage and facilitate the ingress/egress of the plant delivery truck to ensure safety for all users along Herbert Place, including, as required regulatory and direction signposting, variable message signs, traffic management personnel and all other traffic control devices necessary for the implementation of the CTMP. • Ensure the performance of project traffic arrangements is monitored during construction.
T2	Induct employees and contractors to raise awareness and understanding of traffic and transport mitigation measures will be implemented during construction.
T3	To minimise the potential for parking disruptions, the following management hierarchy will be applied: • Existing parking within the SEF will be utilised. • Car parking will occur within the proposed construction compound. • In consultation with neighbouring landowners.

9 Noise and Vibration

This chapter provides an assessment of the potential noise and vibration impacts associated with the Project. Benbow Environmental have undertaken an assessment of the potential noise and vibration impacts associated with the Project to address the SEARs issued by DPE. The Noise and Vibration Assessment (NVIA) is provided in Appendix D of this EIS.

Appendix A provides a summary of the relevant SEARs which relate to noise and vibration and where these have been addressed in this EIS.

9.1 Methodology

The methodology of the NVIA included:

- Noise monitoring to identify existing background noise levels at the Project Site, in accordance with the *Noise Policy for Industry* (NPfI) (NSW EPA, 2017)
- Development of a noise model to predict changes to the existing noise environment from operation of the Project
- Review of potential construction noise impacts with consideration to the *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change (DECC), 2009)
- An operational noise impact assessment in accordance with the NPfI) (NSW EPA, 2017)
- A construction vibration impact assessment, in accordance with *Assessing Vibration: A Technical Guideline* (DEC, 2006)
- Identification of environmental management measures required to avoid, minimise and/or mitigate any potential noise and vibration impacts identified.

9.1.1 Background noise monitoring

Rating background levels (RBL) were determined for nearby receivers based on previous noise background monitoring undertaken for the SEF. Background noise levels for the residential areas to the south (Smithfield and Fairfield) and east (Guildford West)) of the Project Site have previously been measured for the previous modification at the SEF, namely the modification to peaking plant operations (DA94/165-Mod-2).

This background noise monitoring included:

- Unattended long-term noise monitoring in June 2017 at three residential locations
- Attended monitoring in June and July 2017 at seven locations.

Negligible changes to the surrounding acoustic environment have occurred since the time of monitoring. The background noise monitoring locations are shown in Figure 9-1. Further detail on the noise monitoring equipment and methodology carried out is included in Appendix D of the EIS.

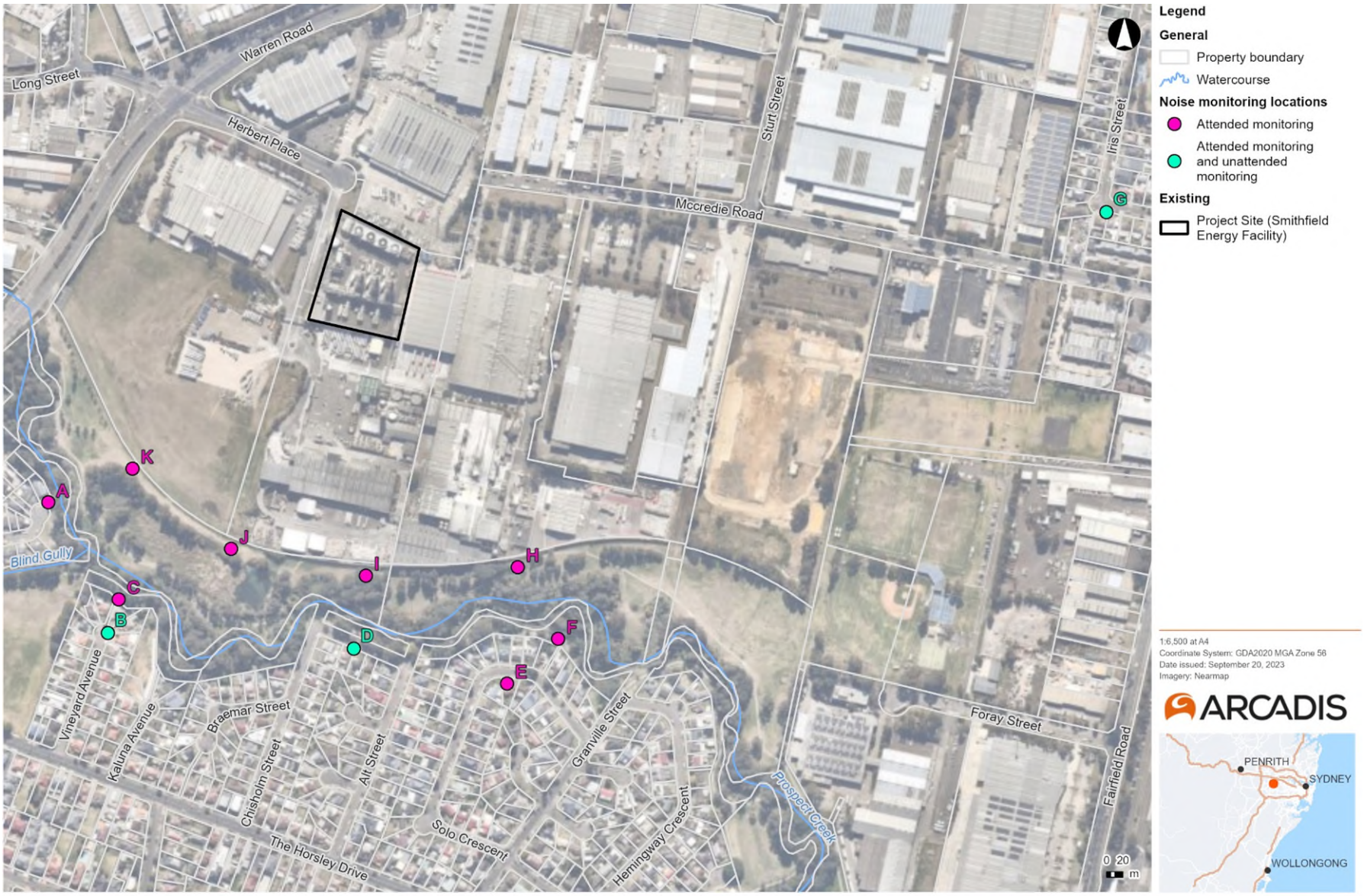


Figure 9-1: Noise monitoring locations

9.1.2 Assessment Criteria

9.1.2.1 Construction noise

Construction activities would be conducted within standard construction hours. The ICNG (DECC, 2009) recommends NMLs to reduce the likelihood of noise impacts arising from construction activities. NMLs for residential receivers are determined based on the RBL established at potential receiver locations. The management noise levels are provided in Table 9-1.

Table 9-1: Construction noise management levels

Time of day	Management level L_{Aeq}(15 minute)	How to apply
Recommended standard hours: • 7 am to 6 pm Monday to Friday • 8 am to 1 pm Saturdays • No work on Sundays or Public Holidays	Noise affected (RBL + 10 dB)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq,(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially affected residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected (75 dB(A))	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: • Times identified by the community when they are less sensitive to noise • If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours (as described above)	Noise affected (RBL + 5 dB)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

Note: RBL = Rating background level, L_{Aeq} = Equivalent continuous sound level, dB(A) = Decibel, A-weighted

9.1.2.2 Construction vibration

When assessing vibration there are two components that require consideration human exposure to vibration and the potential for building damage from vibration.

There are currently no Australian Standards or guidelines to provide guidance on assessing the potential for building damage from vibration. It is common practice to derive goal levels from international standards such as *British Standard BS7385:1993 Evaluation and measurement for vibration in buildings* (BS 7385) and the DEC's *Assessing Vibration - a technical guideline* (2006) provides guidance for assessing human exposure to vibration.

The recommended safe working distances for vibration intensive plant suggested in the *Transport for New South Wales Construction Noise Strategy* (CNS) (TfNSW 2019) have been adopted in this assessment to evaluate the potential for vibration impacts from the proposed works. The CNS identifies construction equipment that may cause vibration impacts including hydraulic hammers, vibratory pile drivers, pile boring, jackhammers, wacker packers, concrete vibrators and pavement breakers, amongst other equipment.

The safe working distances are quoted for both "cosmetic" damage (refer BS 7385) and human comfort (refer *DEC's Assessing Vibration - a technical guideline*). The safe working distances are the typical distances that are required from plant/ equipment to meet the vibration criteria in BS 7385 and DEC's *Assessing Vibration - a technical guide*.

The assessment of vibration impact on Jemena assets was undertaken with regard to the Jemena document - '*Guideline – Designing, Constructing and Operating Assets Near Jemena Gas Pipelines*' (Jemena guideline). The Jemena guideline identifies that "vibrations from any equipment or processes including vibrating compaction equipment, jack hammers, rock hammers, seismic measuring processes, etc. are not to exceed peak particle velocity readings of 20 mm/second at the nearest surface of the buried pipeline".

9.1.2.3 Operational noise

The Noise Policy for Industry (NPfI) (NSW EPA, 2017) provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in NSW. The NPfI recommends the development of noise trigger levels, which provide a benchmark for assessing a proposal or site. The intrusive noise levels and amenity noise levels have been calculated in accordance with the NPfI and are detailed in Appendix D of the EIS. Noise trigger levels have been developed based on the lower value of the intrusiveness noise level and the amenity noise level and are shown in Table 9-2.

Table 9-2: Project noise trigger levels

Receiver ID	Project noise trigger level L_{Aeq} 15 min dB(A)			Sleep disturbance L_{Amax}
	Day	Evening	Night	
R1: Urban	47	47	43	56
R2: Urban / Industrial Interface	47	47	46	56
R3: Urban	47	47	43	56
R4: Urban / Industrial Interface	49	49	48	59
R5: Urban	49	48	43	59
R6: Urban	49	48	43	59
R7-R11: Urban	47	46	41	52
R12-R15: Industrial	68 (When in use)			N/A

Night-time noise occurring over a short duration has the potential to cause sleep disturbance despite complying with noise trigger levels. Since the Project is intended to operate on a 24-hour basis, maximum noise levels need have been considered for potential sleep disturbance. These are included in Table 9-2.

9.1.2.4 Road traffic noise

The Project is expected to generate minimal operational traffic movements as the BESS would be operated remotely. Construction vehicles would have direct access to the Cumberland Highway via Herbert Place without passing residential receivers. The expected traffic generated by the Project is not expected to have any road noise impacts on the surrounding sensitive receivers. Therefore, no further assessment of road noise during operation has been undertaken.

9.1.3 Noise modelling

9.1.3.1 Construction

Potential construction noise impacts from the Project have been modelled using the ISO 9613 algorithm within SoundPLAN v7.3. The sound power levels for the relevant noise sources were calculated from measurements of sound pressure levels undertaken by an acoustic engineer at similar sites and sourced from Benbow Environmental's noise source database, as well as taken from AS 2436: 2010 and the UK Department for Environmental Food and Rural Affairs (DEFRA) database, Update of noise database for prediction of noise on construction and open sites. The modelled noise scenarios are provided in Table 9-3.

Table 9-3: Modelled noise scenarios

Scenario	Time of day	Noise sources for worst 15-minute period
Surface works	Standard working hours	Concrete saw, excavator, truck, hand tools
Concreting construction works	Standard working hours	Concrete truck and pump, hand tools
Structure construction works	Standard working hours	Truck, crane, hand tools

9.1.3.2 Operation

Potential operational noise impacts from the Project at surrounding receptors have been modelled using the Concawe algorithm within SoundPLAN. Noise levels were predicted at areas with the most potential to be impacted, to determine the noise impact against the project specific noise levels and other relevant noise criteria in accordance with the NPfI. The model allows for the prediction of noise from a site at the specified receiver, by calculating the contribution of each noise source. Other model inputs included the noise sources, topographical features of the subject area, surrounding buildings, noise walls and receiver locations.

The following assessment scenarios have been modelled:

- Scenario 1: considers the existing noise levels generated by current site activities
- Scenario 2: considers the cumulative noise impact of the existing site operations (at the SEF) and the proposed site operations (SEF including the BESS).

The modelled noise sources are listed in Table 9-4 and the configuration can be seen in Figure 9-2.

The sound power levels for the operational battery units vary, depending on the cooling requirements of the battery and operational fan loads or 'fan duty'. The noise levels from the fans comprise of two components with fans cooling the battery module (battery fans) and power electronics (PE Fans).

To represent the worst-case cumulative scenario, the model is based on a fan duty consisting of 100% battery fan operations, and 20% PE fan operations, where all units are operating at 100% load, in conjunction with the SEF power plant. This would only occur during the hottest days of the year and would have to overlap with the operations of the SEF plant which in recent years has operated between 2% and 5% of the year.

In practice most of the time (>95% of the time over the year) the PE fans would operate at 20% duty or less and the battery fans operate at 40% duty or less.

Predicted noise levels associated with both standard meteorological conditions and noise enhancing meteorological conditions are presented in this assessment.

A low-frequency modifying factor correction was applied to the noise assessment due to dominant low-frequency content of the existing peaking power plant. Further details regarding modelling methodology, assumptions, meteorological condition and low frequency factors are included in Appendix D.

Table 9-4: Proposed noise sources

Noise source	Quantity	Overall L_{AEQ}
Cooling tower	3	100
18 MVA transformer	9	93
BESS unit front façade	36	69/m^2 (24.5 m^2)
BESS unit right façade (100% load)	36	69/m^2 (4.5 m^2)
BESS unit left façade	36	69/m^2 (4.5 m^2)
BESS unit rear façade	36	71/m^2 (24.5 m^2)
BESS unit thermal cabinet rear	36	87/m^2 (2.5 m^2)
BESS unit thermal cabinet front	36	93/m^2 (2.5 m^2)
BESS unit air intake	36	88/m^2 (2.8 m^2)
BESS unit exhaust fans	36	94/m^2 (3.6 m^2)

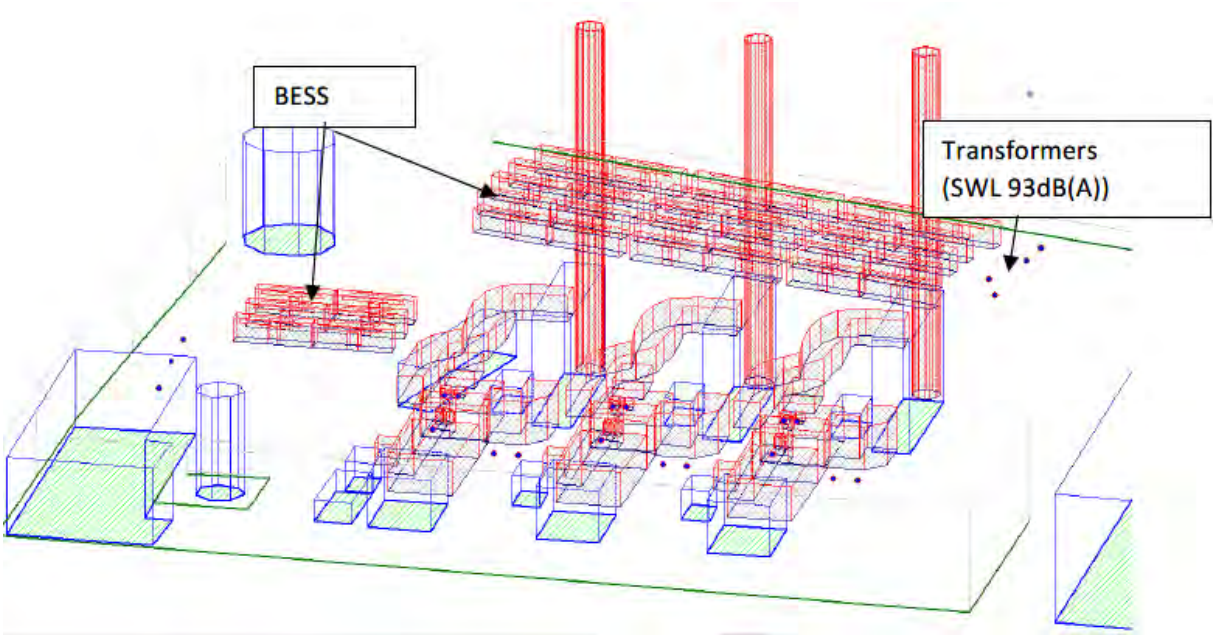


Figure 9-2: Noise source configuration

9.2 Existing environment

9.2.1 Sensitive receivers

The Project Site is located within an established industrial precinct. The nearest residential receivers to the Project Site are located in the suburbs of Smithfield and Guildford West. The nearest residential receiver is located around 400 metres south of the Project Site.

Industrial receivers are located immediately surrounding the Project Site. Nearest representative noise sensitive residential and industrial receivers to the Project Site have been identified in Table 9-4 and are provided in Figure 9-2. These receivers are herein referred to as assessment locations.

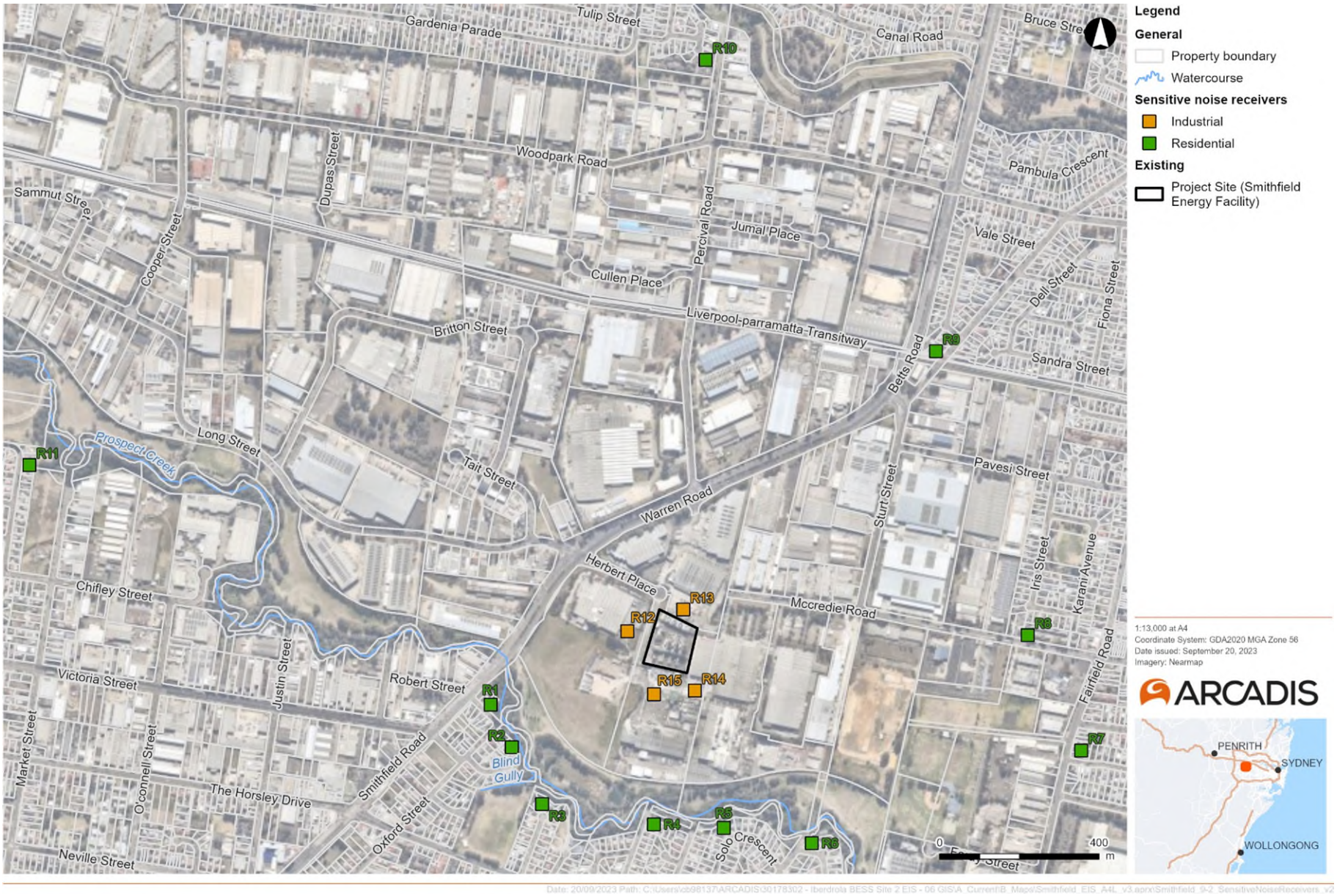


Figure 9-3: Noise assessment locations

9.2.2 Existing ambient noise levels

Background noise levels for the assessment locations have been identified based on noise monitoring as described in Section 9.1.1.

The results of the long-term unattended noise monitoring are displayed in Table 9-1.

Table 9-5: Unattended noise monitoring results dB(A)

Monitoring Location	Assessment Background Level ABL (L_{90})			Assessment Ambient Noise Level L_{eq}		
	Day	Evening	Night	Day	Evening	Night
B	42	46	41	55	51	49
D	44	46	44	59	50	50
G	42	41	36	56	49	47

As the results of the unattended noise monitoring were affected by ambient noise sources such as local fauna, road traffic and industrial sources, use of the unattended noise monitoring results alone was insufficient to determine the existing industrial noise contribution. Therefore, the short-term attended monitoring data provides additional information around the existing ambient noise characteristics, allowing for a more meaningful analysis. The results of the attended noise monitoring are displayed in Table 9-6.

Table 9-6: Attended noise monitoring results dB(A)/dB(C)

Location	Date	Time period	L_{eq}	L_{90}	L_{10}	L_1
A	19/06/2017	Daytime	49 dB(A)	46 dB(A)	51 dB(A)	56 dB(A)
			65 dB(C)	62 dB(C)	67 dB(C)	71 dB(C)
	27/06/2017	Daytime	53 dB(A)	47 dB(A)	55 dB(A)	65 dB(A)
			65 dB(C)	62 dB(C)	67 dB(C)	72 dB(C)
		Evening	50 dB(A)	48 dB(A)	51 dB(A)	55 dB(A)
			65 dB(C)	61 dB(C)	62 dB(C)	73 dB(C)
	28/06/2017	Night	47 dB(A)	45 dB(A)	49 dB(A)	51 dB(A)
			62 dB(C)	59 dB(C)	64 dB(C)	68 dB(C)
B	19/06/2017	Daytime	49 dB(A)	44 dB(A)	52 dB(A)	58 dB(A)
			64 dB(C)	60 dB(C)	66 dB(C)	70 dB(C)
	27/06/2017	Evening	49 dB(A)	46 dB(A)	50 dB(A)	57 dB(A)
			61 dB(C)	58 dB(C)	63 dB(C)	67 dB(C)
		Night	46 dB(A)	42 dB(A)	47 dB(A)	56 dB(A)
			60 dB(C)	56 dB(C)	62 dB(C)	69 dB(C)
C	27/06/2017	Daytime	53 dB(A)	49 dB(A)	55 dB(A)	62 dB(A)
			67 dB(C)	63 dB(C)	69 dB(C)	75 dB(C)
		Evening	49 dB(A)	47 dB(A)	51 dB(A)	53 dB(A)

Location	Date	Time period	L_{eq}	L_{90}	L_{10}	L_1
			65 dB(C)	61 dB(C)	68 dB(C)	71 dB(C)
		Night	48 dB(A)	47 dB(A)	50 dB(A)	52 dB(A)
			63 dB(C)	60 dB(C)	65 dB(C)	70 dB(C)
D	19/06/2017	Daytime	53 dB(A)	45 dB(A)	56 dB(A)	65 dB(A)
			64 dB(C)	61 dB(C)	66 dB(C)	73 dB(C)
	27/06/2017	Daytime	58 dB(A)	48 dB(A)	52 dB(A)	62 dB(A)
			69 dB(C)	61 dB(C)	67 dB(C)	76 dB(C)
		Evening	52 dB(A)	48 dB(A)	51 dB(A)	59 dB(A)
			64 dB(C)	61 dB(C)	65 dB(C)	68 dB(C)
		Night	49 dB(A)	47 dB(A)	50 dB(A)	52 dB(A)
			63 dB(C)	61 dB(C)	65 dB(C)	67 dB(C)
E	19/06/2017	Daytime	50 dB(A)	45 dB(A)	52 dB(A)	61 dB(A)
			62 dB(C)	58 dB(C)	65 dB(C)	68 dB(C)
	27/06/2017	Daytime	49 dB(A)	45 dB(A)	50 dB(A)	58 dB(A)
			64 dB(C)	60 dB(C)	66 dB(C)	71 dB(C)
		Evening	49 dB(A)	46 dB(A)	50 dB(A)	56 dB(A)
			63 dB(C)	60 dB(C)	65 dB(C)	68 dB(C)
		Night	48 dB(A)	46 dB(A)	49 dB(A)	51 dB(A)
			61 dB(C)	59 dB(C)	63 dB(C)	66 dB(C)
F	27/06/2017	Evening	52 dB(A)	51 dB(A)	53 dB(A)	54 dB(A)
			65 dB(C)	63 dB(C)	67 dB(C)	69 dB(C)
		Night	52 dB(A)	51 dB(A)	53 dB(A)	54 dB(A)
			65 dB(C)	63 dB(C)	67 dB(C)	69 dB(C)
G	19/06/2017	Daytime	50 dB(A)	44 dB(A)	53 dB(A)	59 dB(A)
			65 dB(C)	57 dB(C)	68 dB(C)	75 dB(C)
	27/06/2017	Evening	54 dB(A)	40 dB(A)	48 dB(A)	65 dB(A)
			61 dB(C)	54 dB(C)	62 dB(C)	73 dB(C)
		Night	44 dB(A)	40 dB(A)	46 dB(A)	52 dB(A)
			60 dB(C)	54 dB(C)	61 dB(C)	71 dB(C)
H	03/07/2017	Daytime	57 dB(A)	56 dB(A)	58 dB(A)	59 dB(A)
			73 dB(C)	70 dB(C)	75 dB(C)	78 dB(C)
		Evening	57 dB(A)	56 dB(A)	58 dB(A)	59 dB(A)
			72 dB(C)	69 dB(C)	74 dB(C)	76 dB(C)
I	03/07/2017	Daytime	56 dB(A)	50 dB(A)	55 dB(A)	69 dB(A)
			66 dB(C)	64 dB(C)	68 dB(C)	70 dB(C)

Location	Date	Time period	L_{eq}	L_{90}	L_{10}	L_1
		Evening	51 dB(A)	48 dB(A)	52 dB(A)	60 dB(A)
			65 dB(C)	62 dB(C)	68 dB(C)	72 dB(C)
J	03/07/2017	Daytime	56 dB(A)	50 dB(A)	58 dB(A)	68 dB(A)
			70 dB(C)	65 dB(C)	71 dB(C)	81 dB(C)
		Daytime	52 dB(A)	48 dB(A)	53 dB(A)	60 dB(A)
			69 dB(C)	65 dB(C)	70 dB(C)	78 dB(C)
K	03/07/2017	Daytime	56 dB(A)	54 dB(A)	57 dB(A)	60 dB(A)
			69 dB(C)	67 dB(C)	72 dB(C)	75 dB(C)
		Daytime	55 dB(A)	53 dB(A)	56 dB(A)	59 dB(A)
			69 dB(C)	66 dB(C)	71 dB(C)	74 dB(C)

9.2.3 Existing SEF operations

The primary noise sources at the SEF relates to operation of the power trains and specifically the stack mouths. As identified 9.1.3, the existing SEF stacks have been modelled with a sound power level of 105 dB(A) and directivity. Low frequency noise is relevant to the existing SEF and as such has been considered cumulatively with the BESS.

9.3 Potential impacts

9.3.1 Construction

9.3.1.1 Noise

Construction noise levels are shown in Table 9-7 and are predicted to comply with the NSW ICNG at all receivers for all scenarios. Construction activities are proposed to take place during standard construction hours. Standard construction noise mitigation measures would be implemented to minimise construction noise.

Table 9-7 Predicted construction noise levels

Receptor	Receiver type	Noise Management Level	Predicted Scenarios (standard working hours) $L_{Aeq\ 15\ minute}$		
			1	2	3
R1	Residential	52	35	22	24
R2	Residential	52	36	29	28
R3	Residential	52	33	26	25
R4	Residential	54	37	30	29
R5	Residential	54	32	22	21
R6	Residential	54	27	18	15

Receptor	Receiver type	Noise Management Level	Predicted Scenarios (standard working hours) $L_{Aeq\ 15\ minute}$		
			1	2	3
R7	Residential	52	24	13	13
R8	Residential	52	33	27	25
R9	Residential	52	20	9	8
R10	Residential	52	26	22	21
R11	Residential	52	26	21	21
R12	Industrial	75	64	55	53
R13	Industrial	75	67	65	62
R14	Industrial	75	57	55	48
R15	Industrial	75	51	41	43

9.3.1.2 Vibration

Given the distance to the nearest off-site building and sensitive assets such as the Jemena gas pipeline, there is a very low prospect of cosmetic damage (as per BS 7385) or human response (as per *Assessing Vibration - a technical guideline*). Considering the distance to the nearest receivers and the limited vibration generating activities, no vibration impacts are expected from the proposed construction or operational activities.

9.3.2 Operation

9.3.2.1 Predicted noise levels

Residential receptors

Noise levels at the nearest receivers have been calculated and the results of the noise modelling are shown in *Table* 9-8. Noise levels comply at all residential receptors for all weather conditions during all time periods.

Industrial receptors

A residual noise impact above the Project Noise Trigger Levels is predicted at one industrial receiver R13, the neighbouring industrial facility to the north of the Project Site (Lot 1000 DP1077000) (Kingspan) by 1dB. The region that exceeds the criteria (68 dB(A)) is the hardstand area currently being used as a truck depot/material storage area to the north and is not predicted to exceed the criteria at the existing neighbouring industrial buildings.

As noted in Section 9.1.3, the model is based on a fan duty consisting of 100% battery fan operations, and 20% PE fan operations, where all units are operating at 100% load, in conjunction with the SEF power plant. This would only occur during the hottest days of the year (5% of the time on the hottest days of the year). In practice most of the time (>95% of the time over the year) the PE fans would operate at 20% duty or less and the battery fans operate at 40% duty or less. Under these typical conditions the noise levels from each BESS unit will be more than 10 dB(A) less than those modelled as worst-case and would easily achieve compliance at the neighbouring industrial site

Table 9-8: Predicted operational noise levels

Receptor	Receiver type	Predicted Scenarios $L_{Aeq\ 15\ minute}$		
		1A - Existing	2A - Proposed	2B – Proposed (Wind)
R1	Residential	41	41	-
R2	Residential	41	42	-
R3	Residential	40	41	-
R4	Residential	42	43	-
R5	Residential	40	40	-
R6	Residential	38	38	-
R7	Residential	29	29	-
R8	Residential	32	34	37
R9	Residential	25	26	29
R10	Residential	27	29	33
R11	Residential	24	27	32
R12	Industrial	54	59	61
R13	Industrial	54	67	**69**
R14	Industrial	53	55	-
R15	Industrial	53	53	-

9.3.2.2 Low frequency noise

Low frequency noise has been calculated for R1-R6 as they are the worst residential receivers for low frequency noise. These results are included in Table 9-9. The existing development (the SEF) without the proposed BESS exceeds the threshold by up to 4dB. The proposed development generally increases the predicted low frequency noise octave bans by 1dB, resulting in exceedances of the thresholds by up to 4dB. Based on application of the modifying factor corrections for low frequency noise from the NPFI, a 2dB penalty applies at select receptors. With this penalty, the existing and proposed development comply with the Project Noise Trigger Level at all receptors during all time periods and weather conditions.

Table 9-9: Predicted low frequency contribution dB-Linear

Receiver	Scenario	Frequency	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
		Threshold levels	69	61	54	50	50	48	48	46	44
R1	1A: Existing	PL	56	46	54	53	45	50	46	37	42
		Exceedance	0	0	0	**3**	0	**2**	0	0	0
	2A: Proposed	PL	56	47	54	54	46	50	48	38	42
		Exceedance	0	0	0	**4**	0	**2**	0	0	0

Receiver	Scenario	Frequency	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
		Threshold levels	69	61	54	50	50	48	48	46	44
R2	1A: Existing	PL	56	46	55	54	45	51	47	37	43
		Exceedance	0	0	**1**	**4**	0	**3**	0	0	0
	2A: Proposed	PL	57	46	55	54	45	50	49	38	42
		Exceedance	0	0	**1**	**4**	0	**2**	**1**	0	0
R3	1A: Existing	PL	56	46	55	54	45	51	47	37	43
		Exceedance	0	0	**1**	**4**	0	**3**	0	0	0
	2A: Proposed	PL	56	46	54	53	45	50	47	37	41
		Exceedance	0	0	0	**3**	0	**2**	0	0	0
R4	1A: Existing	PL	57	46	55	54	45	50	49	37	42
		Exceedance	0	0	**1**	**4**	0	**2**	**1**	0	0
	2A: Proposed	PL	57	46	55	54	45	50	50	37	42
		Exceedance	0	0	**1**	**4**	0	**2**	**2**	0	0
R5	1A: Existing	PL	56	46	54	53	45	49	46	37	40
		Exceedance	0	0	0	**3**	0	**1**	0	0	0
	2A: Proposed	PL	57	46	55	53	45	49	47	37	41
		Exceedance	0	0	**1**	**3**	0	**1**	0	0	0
R6	1A: Existing	PL	55	45	53	52	44	48	46	36	39
		Exceedance	0	0	0	**2**	0	0	0	0	0
	2A: Proposed	PL	54	44	52	50	43	47	45	35	39
		Exceedance	0	0	0	0	0	0	0	0	0

Note: PL = Predicated levels

9.3.2.3 Sleep disturbance

The plant equipment will operate continuously but does not generate any impulse noise. Therefore, the L_{Amax} from the Project Site is expected to be only 2-3 dB(A) above the predicted $L_{Aeq\ 15\ minute}$ values shown in *Table* 9-8. This complies with the sleep disturbance criteria.

9.3.2.4 Tonal noise

One-third octave levels at residential receptors were assessed for tonal impacts. This included tonal impact at 400 Hz, which is an elevated tone for BESS sources. No tonal component in accordance with the NPfI was calculated. The worst affected receptor was R8, however no penalty was triggered per the NPfI as the difference between one neighbouring band is less than 8 dB.

9.4 Mitigation measures

The NVIA concluded that the Project would not have significant impacts on the existing environment. Table 9-10 outlines the mitigation measures that would be implemented to minimise any potential noise and vibration impacts.

Table 9-10: Noise mitigation measures

Reference	Management measure
Construction	
NV1	Restrict noise-generating construction activities to the recommended standard hours of work: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturday • No work on Sundays or public holidays. Note certain activities may be required outside of the standard construction hours. Key stakeholders would be informed prior to out of hours activities. These activities potentially include: • Delivery of plant and equipment for safety reasons (e.g. OSOM vehicles) • Commissioning and testing activities that must align with demands on the grid • Emergency work to avoid damage to persons or property and/or to prevent environmental harm • Construction works where it can be demonstrated and justified that these works are required to be undertaken outside of standard construction hours.
NV2	Undertake and provide consultation avenues during construction including: • Notifying impacted receivers prior to works commencing • Maintaining community relations throughout construction period Complaints handing through appropriate channels and response mechanism.
NV3	Worksite induction training and / or toolboxes will include education for workers on noise issues related to the Project Site and to be aware of the mitigation measures to be implemented.
NV4	Identify feasible and reasonable approaches to reduce noise and vibration impacts in the CEMP as per the NSW Department of Environment and Climate Change's *Interim Construction Noise Guideline 2009.*
Operation	
NV5	The OEMP will include measures and processes for managing noise resulting from the operation of the Project. The OEMP should have consideration to: • The Noise Policy for Industry (EPA, 2017) • Approved methods for the measurement and analysis of environmental noise in NSW (EPA, 2021) • A process for managing complaints.
NV6	A complaints procedure will be developed and captured to manage situations where nearby receivers perceive noise to be a problem. The procedure will contain the following as a minimum: • Responsibility for investigation into the complaint • Exploration of at-source mitigation if problem noise source identified • If required, noise monitoring at the complainant's property should be undertaken if a noise source if the complainant is not satisfied with the corrective action • Recording mechanism of all complaints and corrective actions.

Reference	Management measure
	• Notification of potentially affected receivers if observations indicate that the noise criteria is being exceeded due to site activities. The affected receiver will be notified in writing of exceedances and the source of the impact in a prompt manner.

10 Hazards and Risk

This chapter provides an assessment of the potential hazard and risk impacts associated with the Project to address the SEARs issued by the DPE. The assessment is informed by a PHA completed by Sherpa Consulting, which has been provided in Appendix E of this EIS.

Appendix A provides a summary of the relevant SEARs which relate to hazard and risk, and where these have been addressed in this EIS.

10.1 Methodology

10.1.1 Government plans, policies, and guidelines

The hazard and risk assessment was prepared with reference to the following plans/ policies/guidelines:

- Resilience and Hazards SEPP
- NSW Department of Planning (DoP), Hazardous Industry Planning Advisory Paper No 4 – risk criteria for land use safety planning, 2011
- NSW DoP, Hazardous Industry Planning Advisory Paper No 6 –guidelines for hazard analysis, 2011
- NSW DoP, Multi-level risk assessment, 2011
- NSW DoP, Hazardous and Offensive Development Application Guidelines - Applying SEPP No. 33, 2011
- International Commission on Non-Ionizing Radiation Protection, Guidelines for limiting exposure to time varying electric, magnetic and electromagnetic Fields (1 Hz – 100 kHz), 2010
- UL 9540A – Standard for safety of energy storage systems and equipment, 2021
- AS/ NZS 5139 – Electrical installations - Safety of battery systems for use with power conversion equipment, 2019
- NFPA 855: Installation of stationary energy storage systems, 2020
- National Transport Commission, Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7, 2009.

10.1.2 Risk screening

The DoP guideline “Applying SEPP No. 33 Hazardous and Offensive Development” provides a risk screening procedure to identify whether a PHA is required. The risk screening process involved the review of type and quantity of hazardous materials to be stored, distance of the storage area to the nearest boundary, as well as the expected number of transport movements.

The preliminary risk screening found that the BESS development by itself is not considered as ‘potentially hazardous’ within the meaning of Resilience and Hazards SEPP and would not require a PHA as the storage and transport of hazardous materials for the proposed BESS facility will not exceed the relevant risk screening threshold. Notwithstanding, a PHA was required by the SEARs and developed with consideration of other risk factors associated the Project Site.

10.1.3Assessment methodology

The PHA was carried out in accordance with the Multilevel Risk Assessment Guideline (DoP, 2011) (MLRA). The MLRA sets out three levels of risk analysis, i.e. qualitative, partially qualitative and quantitative. Based on the hazard identification and consequence analysis, a partially quantitative analysis was determined to be appropriate given the frequency of occurrence of risk contributors having off-site consequences would be low.

The PHA was also carried out in accordance with the HIPAP No.6 – Hazard Analysis (DoPE, 2011) with particular regard to the potential risk to people, property and the biophysical environment that may occur as a result of the accidental release of potential hazardous material and energy.

The PHA included the following steps:

- Establishment of the study context
- Identification of hazards resulting from the operations of the BESS and events with the potential for off-site impact (hazard identification)
- Analysis of the severity of the consequences for the identified events with off-site impact, e.g. fires and explosions (consequence analysis)
- Determination of the level of analysis and risk assessment criteria
- Analysis of the risk of the identified events with off-site impact (Risk Analysis)
- Assessment of the estimated risks from identified events against risk criteria to determine acceptability (Risk Assessment).

The PHA assessed the events associated with proposed operation of the BESS as well as potential hazard interactions with the existing Smithfield Energy Facility (natural gas supply which is a flammable gas) (i.e. excluded construction related events). The Project operational boundary was used to define and determine off-site impact (i.e. impact extending outside of the Project operational boundary).

10.1.3.1 Hazard identification

Hazard Identification (HAZID) was used to identify all reasonably foreseeable hazards and associated events that may arise due to the operation of the facilities and to define the relevant controls through a systematic and structured approach. The HAZID process was completed using the following input:

- Review of the lithium-ion battery system product specification sheets
- Review of AS/NZS 5139:2019 Electrical installations – Safety of battery systems for use with power conversion equipment
- Literature detailing research of past incidents involving similar BESS systems
- Previous risk assessments for similar BESS systems
- Outcomes from SEF site visit
- Consultation inputs from various stakeholders.

10.1.3.2 Consequence analysis

The hazard identification of the proposed BESS facility identified a set of scenarios requiring further assessment to determine the potential for off-site impacts. The analysed incidents were:

- Fire (for example from thermal runaway) involving a lithium-ion battery module
- Toxic gas generation from the decomposition of electrolyte due to a battery module fire.

The analysis also considered the potential for incident propagation from:

- Unignited and ignited release from the SEF gas yard impacting the BESS facility with subsequent BESS fire and toxic gas release
- BESS module on fire escalating to adjacent BESS module.

Fire scenario, toxic gas and flammable gas (methane) modelling was undertaken as detailed below:

- Fire scenario modelling involving the BESS module was undertaken using the Stefan–Boltzmann equation to assess the effect of heat transfer between two parallel planes which represent a BESS module fire and a receptor
- Toxic gas modelling involving the BESS module was undertaken using the Gexcon EFFECTS gas dispersion model that accounted for thermal rise (from the fire)
- Flammable gas (methane) release from the gas yard was undertaken using Gexcon EFFECTS based upon the operating conditions of the SEF.

Calculations, assumptions and modelling outputs are detailed in Section 6 and Appendix B of the PHA.

10.1.3.3 Risk Assessment

Risk is defined as the likelihood of a specified undesired event occurring within a specified period or in specified circumstances. It may be either a frequency (the number of specified events occurring in a unit of time) or a probability (the probability of a specified event following a prior event) depending on the circumstances.

This risk assessment was based on the risk matrix shown in Table 10-1. The acceptance criteria used to assess risk are:

- High and extreme: Unlikely to be tolerable; review if activity should proceed
- Medium: Tolerable, if so far as reasonably practicable
- Very low and low – Broadly acceptable.

Table 10-1: Qualitative risk matrix

Consequence	Likelihod				
	Rare	Unlikely	Possible	Likely	Almost certain
Catastrophic	Medium	High	High	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Low	Medium	Medium	High	High
Minor	Very low	Low	Medium	Medium	Medium
Insignificant	Very low	Very low	Low	Medium	Medium

10.2 Existing environment

The SEF currently operates as an open cycle peaking plant that uses three general electric frame 6541B gas turbines (38 MW). The design consists of three process trains, each incorporating a gas turbine, a diesel starting engine and heat recovery steam generator (from which steam previously would be directed to the steam turbine). The fuel for the plant is natural gas. The turbines include gas and fire suppression systems. The SEF includes gas filters that are shown in Figure 2-2.

Auxiliary equipment associated with the plant includes water treatment and storage facilities, cooling towers and process chemical storage for water treatment and corrosion control. Tanks storing process chemical, the gas turbines and oil filled transformers are all bunded.

The existing Jemena Smithfield lateral is a high pressure gas transmission pipeline that traverses the western border of the SEF. The pipeline includes a high pressure regulating station (including gas inlet line and metering station) at the northwest corner of the SEF (Figure 4-1). This gas is used to provide fuel for the existing SEF gas turbines. The area is security fenced and accessed by Jemena when conducting maintenance.

10.3 Potential impacts

10.3.1Construction

Construction of the Project would require the use of chemicals and dangerous goods (e.g., paint, solvents, diesel, general oils and lubricants, cleaning products). There would be minimal storage of these chemicals. None of the dangerous good thresholds in the Resilience and Hazards SEPP would be exceeded during construction of the Project.

Potential hazard during the construction phase include:

- Vehicle interactions on public roads
- Vehicle interactions within the Project Site
- Natural hazards (flooding, earthquake, lightning)
- Loss of containment of chemicals, including dangerous goods
- Contact with chemicals, including dangerous goods
- Direct or indirect interactions on Jemena assets

These hazards are typical for any battery construction project and would be controlled through implementation of a construction management plan. Following consultation with Jemena (refer Section 6.5), a construction safety management study would be undertaken in accordance with Jemena protocols to mitigate potential impacts associated with the Jemena Eastern Gas Pipeline and regulating station (for example steel plates and exclusion areas).

This element of the project lifecycle is not considered potentially hazardous.

10.3.2Operation

10.3.2.1 Hazard identification and consequence assessment

Table 10-2 summarises the hazards and events identified for the Project using the methodology described in Section 10.1.3. In total, the HAZID identified 19 potential hazard events arising from operation of the BESS and from the existing SEF operations on the BESS.

Table 10-2 identifies the types of hazards applicable to the Project.

Table 10-2: Hazards by BESS component

Hazard	Event	Battery modules	BMS	TMS	Inverters
Electrical	Exposure to voltage	✓	✓		✓
Energy (arc flash)	Release of energy	✓	✓		✓
Fire	Infrastructure fire	✓	✓	✓	✓
Chemical	Release of hazardous materials	✓	✓	✓	
Explosive gas	Generation of explosive gas	✓		✓	
Reaction	Battery thermal runaway	✓			
EMF	Exposure to Electric and Magnetic Fields (EMF)	✓	✓		✓
External factors	Existing power station hazards, unauthorised access/trespasser, bushfire, lightning storm, water ingress (rain and flood)	✓	✓	✓	✓

The findings of the HAZID identified potential hazard associated with the Project and the:

- Northern boundary (HAZID 3, 8-11, 16)
- Power station gas yard (HAZID 4)
- Jemena gas inlet yard (HAZID 5, 18, 19)
- Gas turbine enclosure (HAZID 6)

These are shown in Figure 10-1.

The HAZID and subsequent consequence analyses of the Project identified the following two potentially hazardous scenarios:

- Off-site impact (injury and/or fatality) to the Kingspan industrial site from a fire and hydrogen fluoride toxic gas (if using fluoride electrolyte) involving proposed BESS modules located along the northern site boundary
- Potential incident propagation due to loss of containment (unignited/ ignited) of natural gas from the gas yard (supplies natural gas fuel to the power turbines) impinging on BESS modules.

Figure 10-1: HAZID Overview

10.3.2.2 Risk assessment

The qualitative risk results for the identified events (taken from the HAZID) are shown in Table 10-3.

Of the event types identified that have the potential for offsite impact, two were identified to be 'High' risk. These high-risk events related to:

- Fire with thermal and toxic gas impact for BESS modules located on near the northern site boundary
- Incident escalation involving BESS modules located opposite the high-pressure power station gas letdown yard.

The risk control hierarchy and identified mitigation measures (from separation to engineering controls) would be applied to minimise offsite impact and incident escalation. Applying these measures, the qualitative risk would reduce to medium (for BESS modules at the northern boundary) or very low risk (for incident escalation from the SEF gas yard) rating.

The PHA noted that for all other identified events, they would not be expected to have significant offsite impacts. Based on the study risk acceptance criteria and implementation of recommendations, the risk profile for the proposed Smithfield BESS would be considered acceptable. Additionally, identified events are expected to present negligible societal risk impact as the proposed BESS facility will be located at the existing SEF which is in an area zoned industrial with limited number of people within the consequence footprint.

Table 10-3: Summary of risk analysis

Hazard / Event	Incident Location	Consequence	Offsite consequence results	Risk analysis (off site / public impact)	Mitigation	Risk analysis (off site / public impact) - mitigated
BESS Fire	BESS modules on northern site boundary	• Release of toxic combustion products • Thermal radiation impact • Escalation to the adjacent BESS units • Escalation to adjacent infrastructure	Depending upon BESS type, fatality and injury may extend offsite into the Kingspan site.	High (Catastrophic severity and possible likelihood)	BESS setback distance as per consequence analysis for selected battery type, and/ or fire wall at northern boundary (refer mitigation measure HR3)	Medium
BESS Fire	All other BESS modules (excluding northern site boundary)	• Release of toxic combustion products • Thermal radiation impact • Escalation to the entire BESS • Escalation to adjacent infrastructure	No offsite impact expected as the BESS modules and infrastructure have sufficient separation distances.	Very low (Insignificant severity and unlikely likelihood	No action identified	Low
BESS Fire	Gas yard – flammable cloud ingress or jetfire impingement upon BESS	• Release of toxic combustion products • Thermal radiation impact • Escalation to the entire BESS • Escalation to adjacent infrastructure	Modelling shows that BESS units could be affected by gas yard jetfire. If incident left unchecked, potential for incident propagation. Worst case, offsite impact into Kingspan site.	High (Catastrophic severity and unlikely likelihood)	Provide flange guard protection and/or shielding around gas yard to minimize escalation potential (refer mitigation measure HR5).	Low

10.3.2.3 Assessment against HIPAP No. 4 criteria

The DoP formulated and implemented risk assessment and land use safety planning processes to account for both the technical and the broader locational safety aspects of potentially hazardous industry. These processes are implemented as part of the environmental impact assessment procedures under the EP&A Act. A number of HIPAPs and other guidelines have been published by the Department to assist stakeholders in implementing the process. A partially quantitative assessment against the HIPAP No. 4 – Risk Criteria for Land Use Safety Planning risk criteria was undertaken. The Project was found to comply with all of the criteria.

10.3.2.4 Electric and magnetic fields

Electric and magnetic fields (EMF) are naturally present in the environment. They are present in the earth's atmosphere as electric fields, while static magnetic fields are created by the earth's core. EMF are also produced wherever electricity or electrical equipment is in use, meaning people are exposed to them as part of daily life.

Although adverse health impacts have not been established, the possibility of impact due to exposure to EMF cannot be ruled out. As part of a precautionary approach, the PHA assesses the typical exposure levels to EMF for the Project. In this respect, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has produced a publication to establish guidelines for limiting EMF exposure to assist in providing protection against adverse health effects. The PHA outlines the EMFs associated with the different components of the Project as well as controls to limit exposure to EMF.

The PHA concludes that:

- EMF created from the Project would not exceed the ICNIRP occupational exposure reference level
- As the strengths of EMF attenuate rapidly with distance, the ICNIRP reference level for exposure to the general public would not be exceeded and impact to the general public in surrounding land uses would be negligible
- For the risk assessment, consequence from exposure to EMF was assumed to result in no or minor injury ('Insignificant').

10.4 Mitigation measures

The PHA concluded that the Project would not have significant off-site impacts. The mitigation measures that would be implemented to minimise the potential impacts from hazard and risks of the Project are provided in Table 10-4.

Table 10-4: Hazard and risk mitigation measures

ID	Mitigation Measures
Detailed Design	
HR1	The BESS OEM will meet NFPA 855 or UL 9540A test performance requirements
HR2	Review the investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) and implement relevant findings for the Project when finalising design and preparing for operations. The publicly available investigation reports include: • Energy Safe Victoria: Statement of Technical Findings on fire at the Victorian Big Battery • Fisher Engineering and Energy Safety Response Group: Report of Technical Findings on Victorian Big Battery Fire.
HR3	Measures to minimise the offsite fatality potential from radiation and toxic gas effects from a full BESS module fire at the northern site boundary will be investigated during detailed design. Mitigation measures could include: • Setback of the BESS units as per the estimated PHA radiation fatality distances for the chosen BESS type • Fire wall (engineering measure) along the northern boundary • Orientation of BESS units to minimise radiation impact distance
HR4	Measures will be implemented to minimise the potential for a natural gas leak from the SEF towards the BESS modules. Mitigation measures could include: • Flange guards on the gas yard pipework • Vapour barrier along the gas yard.
HR5	A Final Hazard Analysis will be undertaken for the chosen BESS type to confirm that the spacing and setback distances will minimise the potential for offsite radiation and toxic gas impacts from a BESS fire as well as incident propagation.
HR6	A Fire Safety Study will be prepared to identify measures to eliminate the expansion of any fire incident.
HR7	The final BESS layout will include the specified clearances recommended by the OEM.
Construction	
HR8	Prior to construction, a construction safety management study in accordance with Jemena protocols will be developed with participation from Jemena to further consider the credible threats and mitigation to the Eastern Gas Pipeline and regulating station, including consideration of AS4853 - Electrical Hazard Assessment.
Operation	
HR9	The existing SEF Emergency Response Plan will be updated to include consideration of:

ID	Mitigation Measures
	• How emergency services can safely access the northern site boundary and respond to a BESS fire and toxic gas (hydrogen fluoride) generation in this area. • Communication and response to a BESS fire with the current neighbour, Kingspan on the northern site boundary.

11 Land and Contamination

This chapter provides an assessment of the potential land and contamination impacts associated with the Project to address the SEARs issued by the DPE. The assessment is informed by a Preliminary Site Investigation (PSI) completed by Arcadis, which has been provided in Appendix F of this EIS.

Appendix A provides a summary of the relevant SEARs which relate to land and contamination, and where these have been addressed in this EIS.

11.1 Methodology

11.1.1 Applicable guidelines and policies

The land and contamination assessment has been undertaken in accordance with the following guidelines and policies:

- National Environment Protection Council (NEPC) 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended in May 2013 (NEPM)
- EPA (2020), *Contaminated Land Guidelines: Consultants reporting on contaminated land*
- Heads of the EPA 2020, *PFAS National Environmental Management Plan 2.0*
- R&H SEPP.

11.1.2 Approach

A desktop review was undertaken to identify the soils, geological characteristics and potential for contamination at the Project Site. The desktop assessment included a review of:

- LotSearch Pty Ltd (2023), *Lotsearch Enviro Professional, {LS045045_EP}* (LotSearch 2023), which included a search conducted on 20 June 2023 of:
  - Site environmental setting
  - Heritage and cultural sensitivity items, local historical business directories
  - Landfills, gasworks and waste facilities
  - Per and poly-fluoroalkyl substances (PFAS) investigation sites
  - Online searches of relevant NSW EPA and Office of Water databases
- Historical land title ownership records for the Project Site
- A selection of historical aerial imagery for the Project Site
- Section 10.7(2) and (5) council planning certificates for the Project Site
- Previous contamination investigation reports, provided by Iberdrola

In addition to the desktop review, a site walkover was undertaken on 27th July 2023 to document the land use activities being undertaken on the Project Site, as well as on the properties located immediately adjacent to the site.

11.2 Existing Environment

11.2.1Overview

A summary of the natural geological and hydrogeological features of the Project site and surrounding area is provided in Table 11-1.

Table 11-1: Existing environment - land

Aspect	Description
Topography and elevation	The Project Site is located at an elevation of approximately 20 m Australian Height Datum (m AHD). The topography of the Site is generally flat. The topography surrounding the Project Site is generally flat with gentle slopes reaching a maximum height of 36 m AHD north of the Site and 32 m AHD south of the Site.
Geology and soils	The Project Site is likely to be underlain by unconsolidated alluvial clay, silt, sand and gravel deposits. Kurosol soil is likely to be found onsite, which typically comprises hard acidic red soils with hard neutral and acidic yellow mottled soils on lower slopes and in valleys. The Project Site lies within the Berkshire Park soil group. This soil group typically comprises weakly pedal orange heavy clays and clayey sands, often mottled. Limitations associated with the soil group include very high wind erosion hazard if cleared, localised seasonal waterlogging, localised flood hazard, impermeable subsoils, and low fertility.
Hydrology	The nearest surface water body to the Site is Prospect Creek, located approximately 330m south of the Project Site. The creek feeds into the Georges River, approximately 5.5 km southwest of the Site. Based on site surface topography and elevation, the inferred general surface water flow direction on the Site is considered likely to be toward the southeast.
Groundwater	There are 36 groundwater bores located within a 1 km radius of the Project Site, used predominantly for monitoring purposes. No details on standing water levels or soil logging data were identified. One groundwater well used for commercial/industrial purposes was identified approximately 700 m west of the Site. This borehole is 204m AHD in depth and has recorded salinity levels of 5750 mg/L.
Hydrogeology	The aquifer onsite is considered to be porous, extensive and of low to moderate productivity. Based on the location of the identified surface water courses and site topography, the inferred groundwater flow direction at the Site is considered likely to be towards the southeast.
Acid sulfate soils	A review of the CSIRO Atlas of Australian Acid Sulfate Soils Data Source indicated that the Site is located in a map class description of ‘extremely low (1-5%) probability’.
Crown land	The Project Site or immediate surrounds does not contain any Crown Land
Mining, quarries, mineral or petroleum rights	The Project Site or immediate surrounds is not located in a designated Mine Subsidence District.
Historical land use	The Project Site appears to have remain largely undeveloped until the mid 1990s. The Project Site underwent significant redevelopment into the current energy facility, the SEF.

11.2.2Potential contamination

The desktop review of the council, state and defence records found no potential land contaminating activities on the Project Site. However, such activities were identified within 1 km of the Project Site, including liquid fuel facilities and motor garages. Similarly, no potential land contaminating activities were identified on the Project Site based on the results of the desktop review of the planning certificate.

The desktop review of the NSW EPA records revealed potential land contaminating activities on and surrounding the Project Site. These include the current use of the Project Site as an energy facility, and Visy Paper Pty Ltd located immediately adjacent to the Project Site. Other nearby activities potentially causing contamination include waste generation and treatment, agricultural processing and toxic substance production.

A Contamination Baseline Assessment (CBA) completed by Arcadis in 2019 on the same property found no exceedances of human or ecological health assessment criteria within soil samples taken from the Project Site. Minor exceedances of groundwater and surface water criteria were observed. Exceedances of zinc in the groundwater were only marginal and likely indicative of naturally occurring groundwater conditions. Concentrations of PFAS in groundwater were also in exceedance of the applicable guidelines, albeit the source of this was unknown. In surface water, concentrations of chromium, copper and zinc were found to be in exceedance of Tier-1 health or ecological screening criteria. Nevertheless, the CBA found that there was a low risk of gross contamination based on the results of the intrusive investigation and groundwater and surface water monitoring.

The desktop assessment review indicated a potential for uncontrolled filling and leaks or spills from storage tanks with associated contaminants. Thus, potential contaminants anticipated to be on-site are asbestos, polychlorinated biphenyls (PCBs), water treatment chemicals and PFAS. However, field observations and analytical results were below the Tier 1 screening criteria within the NEPM for the following contaminants:

- Total recoverable hydrocarbons
- Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons
- Organochlorine pesticides / organophosphate pesticides
- PCBs
- Asbestos
- PFAS.

Therefore, a source of contamination which may pose a risk to human health though direct contact, inhalation vapour intrusion or direct uptake, within a commercial or industrial land use has not been identified.

11.3 Potential Impacts

11.3.1Construction

Acid sulfate soils

As defined in the NSW EPA Waste Classification Guidelines Part 4: Acid Sulfate Soils (2014), acid sulfate soils are those naturally occurring sediments and soils which contain sulfides, mainly iron sulfide and iron disulfide or

their precursors. The risk of exposing potential and/or actual acid sulfate soils may cause major environmental, agricultural and structural impacts in affected areas if not adequately managed. Potential impacts may include:

- Negative impacts to ecosystems
- Impacts on vegetation growth and agricultural productivity
- Structural damage and corrosion of steel and concrete structures.

The risk of exposing potential or actual acid sulfate soils is considered to be low, given the location of the Project and the very low potential for acid sulfate soils to be present on the Project Site.

Contamination

As outlined in Section 11.2 the potential for contamination to occur at the Project Site is considered to be low. Potential exposure pathways for contamination may include:

- Direct dermal contact with contaminated soil or groundwater
- Inhalation of contaminated dust or vapour
- Ingestion of contaminated dust.

During construction, exposed areas of soil could result in a heightened risk of inhalation, ingestion or direct dermal contact with dust particulates. This risk will be managed in accordance with the mitigation measures listed in Section 11.4.

Considering the Project Site and surrounding area is underlain with clay material, it is unlikely that contamination created onsite during construction will pose a risk to aquatic ecological receptors downgradient of the Project Site.

11.3.2Operation

Acid sulfate soils

Given that the presence of acid sulfate soils within the Project Site is considered to be very low, it is not anticipated that the operation of the Project will disturb any acid sulfate soils.

Contamination

The Project includes the operation of the BESS and other electrical infrastructure, which pose a low risk for potential contamination. Given that the development is predominantly hardstand with large buildings, and extensive areas covered with concrete or asphalt, it is unlikely that a contamination risk to human and ecological receptors will eventuate unless intrusive maintenance work is undertaken. Thus, the operation of the Project is not anticipated to result in contamination impacts.

Potential for contamination from stormwater contaminants is be addressed by the mitigation measures presented in Chapter 12.

11.4 Mitigation Measures

Based on the predicted low chance of contamination, the Project Site is considered suitable for the construction and operation of the Project. It is unlikely that the Project Site will need to be remediated prior to construction. Additionally, the mitigation measures proposed will minimise any potential impacts that may

arise through construction and operation. Table 11-2 outlines the mitigation measures that would be implemented to minimise any land and contamination impacts.

Table 11-2: Land and contamination mitigation measures

Reference	Management measure
Construction	
LC1	An Unexpected Finds Protocol will be included in the CEMP to manage any disturbance of material that is odorous, stained or containing anthropogenic materials, in the event these are encountered during construction.
LC2	Should fill be identified at the location of the cooling towers, further sampling will be undertaken to address the data gap present and for waste classification
Operation	
LC3	The OEMP prepared for the Project will include measures to manage any spills that occur during operation.

12 Water

This chapter describes the potential water quality, flooding and water use impacts associated with the Project, to address the SEARs issued by the DPE. The assessment is informed by a Water Assessment report completed by Arcadis, which has been provided in Appendix G of this EIS.

Appendix A provides a summary of the relevant SEARs which relate to water, and where these have been addressed in this EIS.

12.1 Methodology

The Water Assessment was prepared with reference to the following legislation, policies and guidelines:

- POEO Act
- B&C SEPP
- R&H SEPP
- Cumberland DCP
- Cumberland Council Flood Risk Management Policy 2021
- Managing Urban Stormwater: Soils and Construction – Volume 1, commonly known as the 'Blue Book' (Landcom, 2004)
- Flood Risk Management Manual (State of NSW and Department of Planning and Environment, 2023)
- Australian Rainfall and Runoff (Ball et al, 2019)
- Liquid Chemical Storage, Handling and Spill Management: Review of Best Practice Regulation (DEC, 2005)
- Storing and Handling liquids: Environmental Protection: Participant's Manual (DEC, 2007).

12.1.1 Approach

To review potential water quality, flooding and water use impacts, a desktop review, site walkover and flood modelling was undertaken. The desktop review and site walkover identified the existing topography, hydrology, stormwater network, site water use and the potential impacts from the Project on these aspects.

This flood assessment was undertaken using the flood model provided by Council in September 2023 taken from the Holroyd City LGA Overland Flood Study prepared by Lyall & Associated Consulting Water Engineers in June 2017. The flood model was refined to better represent the existing conditions of the Project Site and to assess the potential flood impacts from the Project. This refinement included:

- Reducing the extent of the TUFLOW model to the local catchment
- Updated building footprint extents in the immediate area and within the Project Site based on 2023 aerial photography, 2023 site photographs and historical site drawings
- Raising the existing water tank, defining the hydraulic roughness of internal roadways and incorporating the solid external perimeter walls of the Project.

A representation of the Project was developed within the TUFLOW model based on an indicative footprint of the proposed works. For the purpose of the flood assessment, it was assumed that any structures or

infrastructure at ground level will be raised above the 1% AEP flood level with a minimum horizontal clearance of 1 metre from the existing internal roadway gutter.

12.2 Existing environment

12.2.1 Land use, topography and hydrology

A review of the site topography has been undertaken based on the 1 metre 2019 digital elevation model data sourced from the NSW Government Spatial Services. The Project Site and internal road network are relatively flat with a fall from 19.1m AHD in the northwest corner of the site to 17.7m AHD in the southeast corner. The low point of the Project Site is at a low point on the roadway with a drainage pit provided.

The Project Site includes an internal road network of sealed asphalt roads with roll kerbs. Portions of the roadway used as bunded areas are concrete hardstands. Outside of the various buildings and concrete slabs around the site, the ground cover is either concrete or a layer of gravel overlaying the soil. No significant vegetation is present on the site. The majority of the existing Project Site is impervious surfaces. The properties surrounding the site are similarly industrial land uses with large warehouses, minimal vegetation and highly impervious surfaces.

The Project Site is located within the Prospect Creek catchment with Prospect Creek located approximately 330 metres downstream to the south of the Project Site. From this location, Prospect Creek continues to drain southeast to Georges River and Botany Bay. Two coastal floodplain wetlands and one coastal freshwater lagoon have been identified within 300 metres of the Project Site; one coastal wetland is noted along Prospect Creek in Vineyard Reserve bordering the Visy site boundary.

12.2.2 Existing drainage network

An existing drainage network is present throughout the Project Site. No drainage infrastructure from surrounding properties intercept the Project Site nor drain into its existing drainage network.

The existing stormwater management system separates rainfall runoff collected from potentially contaminated catchments to allow for appropriate treatment prior to discharge, as follows:

- Runoff from roof and gravel areas is collected via subsoil drains and downpipes, and drained to onsite detention (OSD) tanks
- Runoff from roadways and parking areas is collected via road drainage pits and drained into a 35 m^3 first flush tank. Any oil-contaminated water is recovered and treated separately in an oil water separator with a capacity of 30 KL/hr
- Runoff from the steam turbine area is collected in floor drains and drained via an isolation valve to a collection pit, and subsequently pumped to the 30 KL/hr oil water separator for treatment
- Two OSD tanks, with a total volume of 350 m^3, are located along the eastern boundary of the Project Site, from where stormwater discharges to an outlet control pit before draining into the neighbouring Visy site, and ultimately into Prospect Creek
- In the event of a fire or a major spill, an isolation valve can be closed to prevent stormwater discharging from the Project Site. An alternative outlet for the pit to discharge directly to the sewer is also available

- Runoff from the enclosed workshop and gas turbines is collected in floor drains and treated by a 3 KL/hr oil water separator before being discharged to the sewer
- Runoff from bunded site areas is controlled by valve releases in accordance with the Project Site's spill management protocols. Runoff from these areas drain to an oil water separator.

The Spill Prevention Control and Contaminant Report outlines the spill management procedures and includes routine monitoring of the Project Site stormwater system. Chemical storage areas are under cover and all bulk liquid chemicals are within bunded areas.

All spill or chemical releases in bunded areas are treated and/or discharged to the sewer. It is understood that a Sydney Water trade waste agreement was previously in place for the discharge to the sewer. Based on the quality and quantity of discharges and inclusion of an inline water quality treatment it is understood that Sydney Water have stated they no longer require a trade waste agreement for these operations

12.2.3Water quality

The Prospect Creek catchment is highly urbanised. The NSW Department of Planning and Environment (DPE) Water Sharing Plan Report Card for the Prospect Creek Water Source (dated April 2022) notes the water source as having a low ecological value. The Georges River Report Card 2021-2022 (Georges Riverkeeper) assessing river health indicators against environmental guidelines notes the Prospect Creek Upper as having an overall fair grade with the following gradings:

- Riparian vegetation – A^+ excellent
- Water quality – C^- fair
- Freshwater macroinvertebrates – E^- poor

12.2.4Flooding

The Project Site and surrounding lots are classified as flood control lots and impacted by the 1% AEP (100 year ARI) flood event, as shown in Figure 12-1.

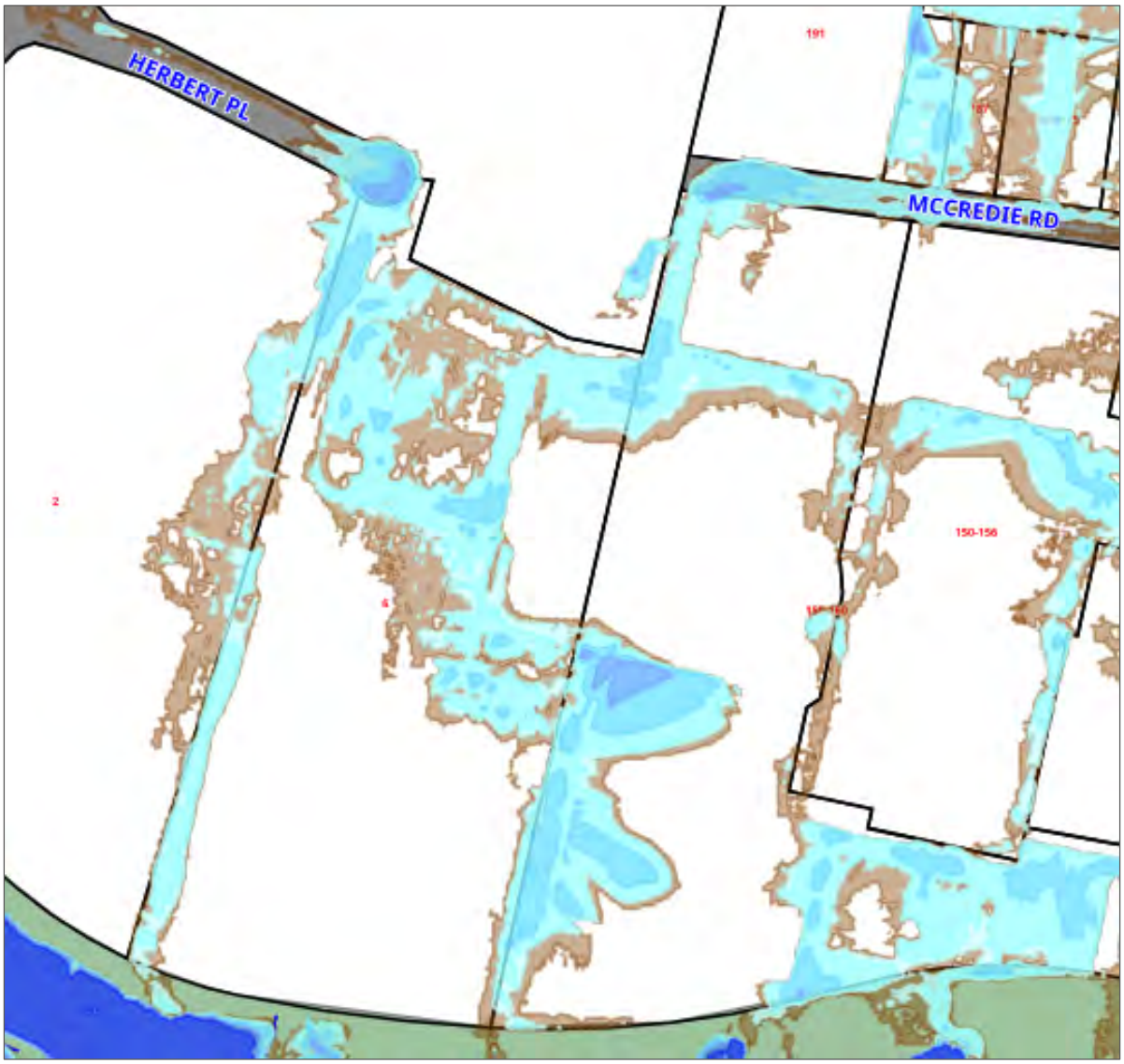


Figure 12-1: Existing 1% AEP flood depths (source Cumberland City Council)

The 1% AEP flood extent covers the majority of the Project Site with flood depths of up to 0.5 metre along the main overland flow paths. Overland flows from the surrounding areas appear to drain into Project Site from the site access road along the western site boundary in the north and also across the eastern site boundary in the north. These overland flows follow the topography to drain southeast crossing the southern site boundary.

Vehicle access to the Project Site is impacted by flood depths ranging from 0.5 to 1 metres in the 1% AEP flood event at the Herbert Place cul-de-sac. During a Probable Maximum Flood (PMF) event the entirety of the Project Site is inundated as well as Herbert Place and the neighbouring properties to the west, south and east from Prospect Creek. The majority of the Project Site is considered low hazard, with some portions to the south classified as high hazard in the PMF event.

12.2.5Water use

Portable water sourced from Sydney Water is currently used for SEF operations with wastewater discharged to the sewer. Recent water usage data is provided in Table 12-1. No water reuse is evident for existing operations.

Table 12-1: Recent water usage data

Month (2023)	Potable Water Usage (kL)	Discharge to Sewer (kL)
February	154	135
March	911	801
April	1053	926
May	1988	1749
June	861	758
July	841	739
August	967	850

12.2.6Groundwater

There are a total of 36 groundwater bores located within a 1 km radius of the Project Site, used predominantly for monitoring purposes. One groundwater bore is used for commercial or industrial purposes, located approximately 700 metres west of the Project Site. This bore is 204 metres AHD in depth and has recorded salinity levels of 5,750 mg/L. Based on the location of the identified surface water courses and topography of the Project Site, the inferred groundwater flow direction is considered likely to be towards the southeast.

12.3 Potential Impacts

12.3.1Construction

Construction activities with the potential to impact the surface water quality and quantity of the downstream environment associated with the Project include:

- Alteration of the topography of the Project Site
- Demolition or removal of existing structures, infrastructure or materials
- Removal or modification of existing drainage infrastructure structures
- Use of water for construction activities such as dust suppression, commissioning of the pipelines and dewatering
- Stockpiling of materials
- Spills or leaks of substances such as oil, hydraulic fluids and fuels
- Waste materials from construction activities
- Movement of vehicles and equipment.

The risk of construction activities impacting water quality or water quantity is increased in proximity to areas such as:

- Concentrated flow paths such as the existing pit and pipe drainage lines
- Areas within flood extents that may be impacted by flooding in a large rainfall event

- Construction compound areas where stockpiling of materials and equipment occurs.

It is not anticipated that the Project would intercept groundwater and the construction of the Project would have a limited water demand during construction. Water and hydrology impacts arising from the construction of the Project are considered minimal due to the limited duration and intensity of construction activities.

12.3.2Operation

Stormwater management

Stormwater runoff from the Project Site would be collected and conveyed via pit and pipe drainage infrastructure. The drainage lines will discharge to the existing drainage network on-site for treatment and flow mitigation prior to discharging from the Project Site. The stormwater management of the Project will align with the existing stormwater management strategy and treatment train for the SEF, as described in Section 12.2.2.

Where required, the existing drainage infrastructure would be modified to accommodate the Project infrastructure, both above and below ground level. Additional stormwater collection pits and drainage pipes may be required to ensure adequate collection of the 20-year ARI design event, and to maintain a flow hazard regime depth velocity product of no greater than 0.4m^2/s in the 100 year ARI design event.

The Project is not anticipated to alter catchment areas within the Project Site, redirect any overland flow paths or alter the discharge location from the Project Site.

Flooding

The design of the Project has the potential to impact flood conditions within and surrounding the Project Site due to changes in ground surface conditions. The flood modelling demonstrates the overland flow paths entering the Project Site across the western and eastern boundaries. For the Project Site in the 1% AEP flood event:

- Peak flood depths occur at low points along the internal roadways with up to 0.4m at the Project Site entrance, and up to 0.5m in the southeast corner of the Project Site
- Peak velocities across the Project Site are generally less than 1m/s
- With a depth velocity product less than 0.3m^2/s, the hazard classification reaches H2 (unsafe for small vehicles) at the deeper road low points with the remainder of the Project Site considered generally safe for vehicles, people and buildings based on the Australian Institute for Disaster Resilience general flood hazard vulnerability curve

Flood impact mapping provided in Figure 12-2 and within Appendix G demonstrates that the modelled Project extent does not have a significant adverse impact on overland flow flood levels for the surrounding properties. The Project extent does not significantly impede the overland flow entering the Project Site from the western and eastern Project Site boundaries and does not divert or redirect overland flow paths within the Project Site. Peak flood level increases greater than 0.01m are limited to the area within the Project Site.

Flooding has the potential to increase risks on-site to people and infrastructure. Building structures and equipment need to be able to withstand the forces of flood waters, debris and buoyancy. The Project will elevate infrastructure above flood levels in accordance with applicable industry standards and guidelines. For the batteries and electrical equipment these will be elevated above the 1% AEP flood level as a minimum. Sufficient safety measures would be incorporated into the design of the BESS facility to prevent any discharge of electrical current into flood waters such as the Battery Management System and electrical protection

systems which would include fault detection and shut-off functions to prevent any discharge of electrical current into flood waters.

Whilst the Project will be operated remotely, the potential risk of flooding on-site is to be adequately addressed through operational procedures. Flooding in the local area is expected to be flash flooding in nature with little warning time. Vehicle access to the site is expected to be impacted during a flooding event with flood depths ranging from 0.5 to 1 metre in the 1% AEP flood event at the Herbert Place cul-de-sac. Flood refuge on-site above the PMF level is available within the existing site offices located on the second floor of the building.

Water quantity

The Project proposes to maintain the existing catchment areas and overland flow paths with no increase in the impervious area. Prior to discharge from the Project Site, all stormwater runoff will pass through the existing on-site detention tank. Therefore, the Project is not expected to significantly impact the peak flow rates leaving the Project Site.

Water quality

The Project does not propose to store any additional materials on-site which may be potential contaminant sources. The existing SEF includes designated storage areas and bunded areas of storage and handling of potential pollutants. The proposed battery units are understood to be housed in weather-proof enclosures which are not expected to release any pollutants should they be inundated.

Given the existing conditions on-site, proposed Project operations and stormwater management strategy, the Project is not expected to have a significant impact on the water quality discharging from the Project Site.

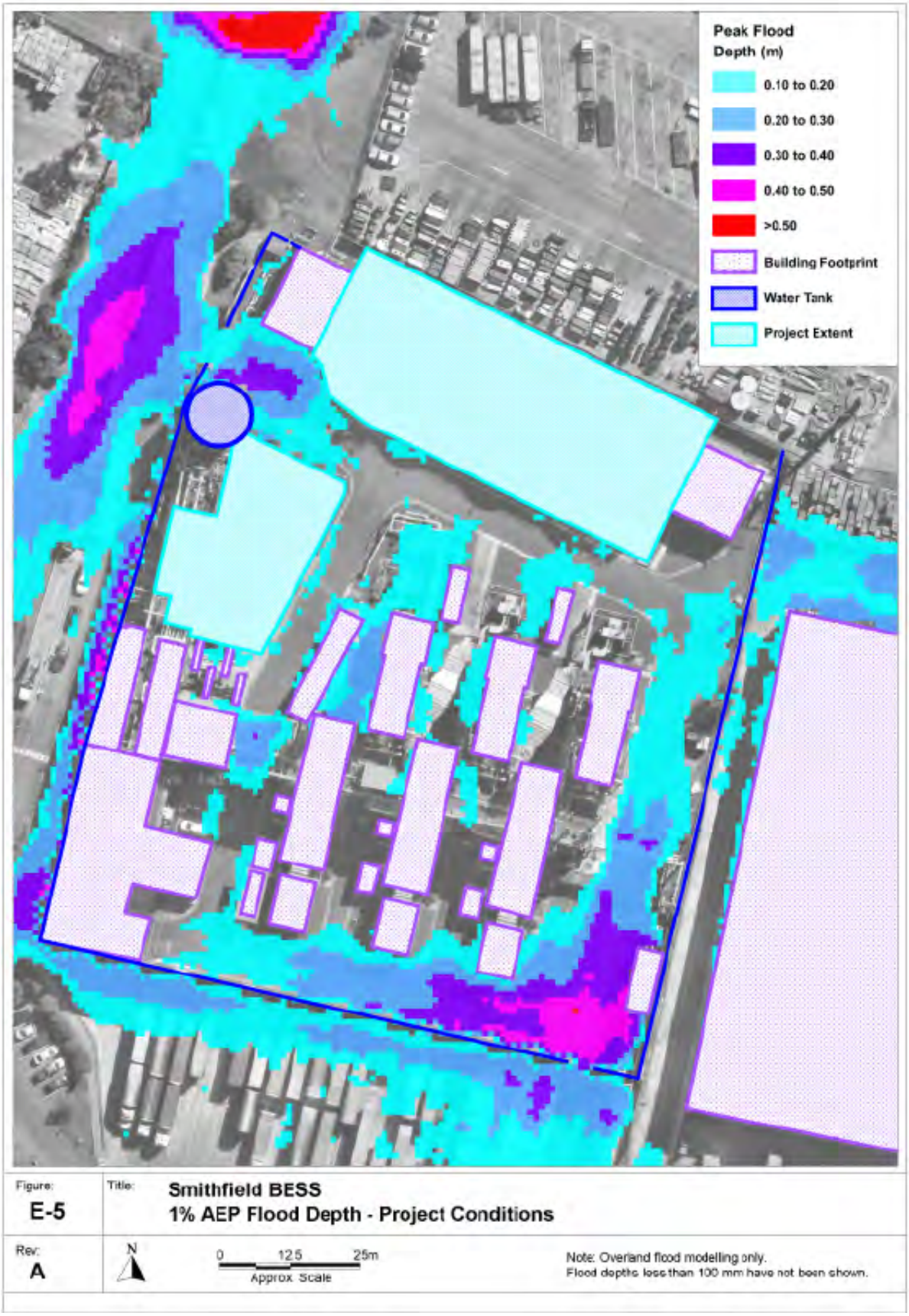


Figure 12-2: 1% AEP Flood Depth

Water Use

No additional water use is proposed for the Project Site as part of the Project as:

- The proposed BESS infrastructure does not require water to operate and would be remotely operated
- The existing amenities would continue to be utilised by the staff that operate the SEF (no additional amenities are required)

Any potential water storage on-site required for fire-fighting purposes (subject to the Fire Safety Study during detailed) would be sourced from the existing Sydney Water potable water main for the Project Site. There is a Sydney Water hydrant available at the Project Site which would be used for fire-fighting purposes.

12.4 Mitigation Measures

A summary of the proposed surface water mitigation and management measures is provided in Table 12-2.

Table 12-2 Water mitigation measures

ID	Mitigation Measures
Detailed Design	
W1	Where feasible the design of the Project will consider the following stormwater management principles: • Maintaining existing sub-catchment areas • Maintaining existing overland flow paths to the downstream • Maintaining existing drainage outlet connection to the downstream • Maximising pervious areas • Minimising fill, infrastructure and building footprints below the 1% AEP flood level • Ensuring potentially contaminated runoff is sufficiently collected and treated appropriately • Minimising potential contaminant sources on site, and where feasible ensuring any dangerous goods are stored above the 1% AEP flood level plus 500 mm freeboard. The detailed design will meet applicable Australian standards and guidelines including the Australian Building Codes Board – Construction of buildings in flood hazard areas.
W2	The detailed design will verify that flood impacts off-site are minimised and to confirm flood levels within the Project Site to inform the design. Project infrastructure will be elevated above flood levels in accordance with applicable industry standards and guidelines. For the batteries and electrical equipment these will be elevated above the 1% AEP flood level as a minimum. Non-habitable floor levels (such as the proposed additional switch room) will be located 0.15 metre above the 1% AEP flood level at a minimum where the 1% AEP flood depth is greater than 100 mm.
W3	Sufficient safety measures (i.e., Battery Management System) will be incorporated into the design to prevent any risk of electrical current discharging during a flood event.
W4	The detailed design will verify that the Project does not result in any increase to stormwater runoff peak flows discharging from the site for all design storm events up to the 1% AEP.

ID	Mitigation Measures
W5	The existing water quality treatment measures and maintenance schedules will be reviewed during detailed design to verify the Project aligns with the existing stormwater strategy and avoid impacts on the downstream environment.
Construction	
W6	A Soil and Water Management Plan and Erosion and Sediment Control Plan (ESCP), or equivalent, will be incorporated into the CEMP. These plans will be developed and implemented in accordance with the principles and requirements of the *Landcom 2004 Managing Urban Stormwater: Soils and Construction – Volume 1* (commonly known as the 'Blue Book'). The ESCP will be progressively updated to reflect the changing nature of the Project site as construction activities progress.
W7	Inspection and monitoring of the erosion and sediment control measures and the internal SEF drainage network will be undertaken regularly throughout the construction period and following large rainfall events. Any increase in sediment loads resulting from construction activities may necessitate more frequent maintenance of the SEF drainage network, including the on-site detention tank and oil-water separators
W8	An incident response procedure will be prepared to manage the response for potential spills on-site. This may include closing off the isolation valve at the drainage outlet of the Project Site to prevent any stormwater discharge from the Project Site drainage network.
Operation	
W9	Project Site operational procedures will be reviewed and updated as required to ensure sufficient flood emergency management procedures are in place for the Project.

13 Social and Economic

This chapter draws on a Social Impact Assessment (SIA) and an Economic Impact Assessment (EIA) prepared by HillPDA to assess the potential social and economic impacts associated with the Project. The SIA has been included as Appendix H, and the EIA has been included as Appendix I.

Appendix A provides a summary of the relevant SEARs which relate to social and economic impacts, and where these have been addressed in this EIS.

13.1 Social assessment

13.1.1 Methodology

The SIA was completed in accordance with the requirements of the *Social Impact Assessment Guideline 2023* (DPE, 2023) (SIA Guideline). The study area for the SIA was defined as Smithfield suburbs and localities, which were likely to experience social impacts from the Project.

Social impact was defined as the net effect of an activity on a community and the wellbeing of individuals and families, including impacts to way of life, community, access, culture, health and wellbeing, surroundings, livelihoods and decision-making systems.

To establish the social baseline, a desktop review was conducted, examining data provided by the Proponent and consulting public databases such as the Australian Bureau of Statistics (ABS), NSW Bureau of Crime Statistics and Research (BOCSAR), DPE and Council resources.

Potential impacts identified in the scoping process were analysed based on the nature of the impact and its predicted severity. This information was used to determine the level of significance as per Table 13-1. Detailed information about the methodology adopted can be found in Appendix H.

Table 13-1: Level of significance adapted from the SIA Guideline.

Likelihood	Magnitude				
	Minimal	Minor	Moderate	Major	Transformational
Almost certain	Low	Medium	High	Very high	Very high
Likely	Low	Medium	High	High	Very high
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

13.1.2 Existing Environment

The Project Site is located within the Smithfield Industrial Estate, which forms part of the broader Smithfield-Wetherill Park Industrial Estate. The broader estate accommodates almost 3,000 businesses and supports approximately 20,000 jobs. It is strategically connected to national and international transport networks,

including the M4 and M7 Motorways and the new Western Sydney Airport. The nearest residential land uses are located approximately 370 metres to the south of the Project Site.

A review of the 2021 census data for Smithfield and its surrounding suburbs revealed that there were 13,160 people living in the area, with a median age of 38. The median weekly household income in the region was $1,300 per week, with 4,040 people employed in the work force. The most common industries of employment were supermarket and grocery stores, road freight transport and hospitals.

The Smithfield area has relatively high socio-economic disadvantage, with rates of crime also generally higher than the Cumberland LGA and NSW.

The industrial nature of the Project Site and surrounds limits the availability of social infrastructure in the vicinity of the Project Site. However, there are open space, recreational, and community facilities located in proximity to the Project Site.

13.1.3Potential Impacts

Activities associated with the construction and operation of the Project have the potential to be disruptive to the day-to-day lives of residents, workers, visitors and businesses in the surrounds. The social impacts from the Project that may arise are influenced by:

- The social and geographic context of the Project Site
- The construction process, final built form, and operations of the Project
- Any measures put in place to mitigate against identified negative impacts and enhance positive impacts.

An evaluation of the potential social impacts and the proposed mitigation response during the construction and operation phase is provided in Table 13-2.

The SIA concluded that the Project can be effectively mitigated through the implementation of a range of measures, as documented throughout this EIS and summarised in Chapter 19.

Table 13-2 Social impact evaluation and mitigation

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
Construction				
Way of life	• Additional construction vehicle movements may increase congestion on surrounding roads and impact neighbouring businesses way of reducing life, access and livelihoods for surrounding residents, workers, and businesses. • Noise and vibration from construction activity may negatively affect amenity for residents, workers and businesses surrounding the Project Site, impacting upon quiet enjoyment of surroundings, way of life and health and wellbeing	Low	Implement mitigation measures T1-T3, NV1 – NV4	Low
Access	• Potential changes to access for surrounding businesses and residences (including from parking for workers on site) during construction, impacting on accessibility	Low	Implement mitigation measures T1-T3	Low
Culture	• Potential impact on community and culture through fear of impacts to Aboriginal cultural and historic heritage sites during construction	Low	Implement mitigation measures H1	Low
Health and wellbeing	• Dust from construction activity could cause a decline in air quality, impacting the amenity of surroundings and health and wellbeing of neighbouring workers • Release of hazardous building materials during construction could potentially impact the health and wellbeing of neighbouring workers.	Low	Implement mitigation measures AQ1-AQ8, LC1, LC3, HR8	Low
	• Potential for increased safety risks to local workers during the construction phase, associated with undertaking construction activities at the Project site.	Medium	Implement mitigation measures T1-T3, H8	Low
Livelihoods	• Additional employment opportunities on site arising from construction activity (direct and indirect) positively impacting livelihoods	High (Positive)	Refer to EIA in Appendix I	High (Positive)
Decision making systems	• Potential feeling of powerlessness or lack of means to have input or say on the Project during construction for surrounding properties and the wide community, negatively impacting decision-making systems	Medium	Implement mitigation measures SE1	Low

Aspect	Detail	Evaluation	Project specific measures	Residual impact significance
Operation				
Way of life	• Noise emissions from the operation of the facility could potentially impact residents, workers, and businesses (on site and surrounding) enjoyment of surroundings, way of life and health and wellbeing	Low	Implement mitigation measure NV5-NV6	Low
Access	• Impact to surrounding parking availability from on-site uses, impacting accessibility and way of life for surrounding residents, workers and visitors, and livelihoods for nearby businesses who rely on existing parking	Low	Project would be operated remotely and suitable existing parking available at the SEF	Low
Health and wellbeing	• Potential for negative impacts on local workers health and wellbeing resulting from the storage of dangerous goods, which could potentially lower the overall safety of the area. • Potential for fire involving the lithium-ion battery to start at the Project Site with the potential to spread offsite, increasing risks to the health and wellbeing of surrounding workers and residents	Low	Implement mitigation measure LC3, HR1-7 and HR9	Low
Surroundings	• Improvements to the surroundings, which could improve feelings of safety for residents and workers in the area, due to increased activity and passive surveillance surrounding the Project Site	Low (Positive)	N/A	Low (Positive)
	• Potential impacts to the surroundings (and community) for local residents through visual impacts and changes to visual amenity associated with the Project	Low	Implement mitigation measures V1 – V2	Low
	• Potential for a fire (from battery specific failure modes) and/or toxic gas generation result in offsite impacts, including impacts to the surroundings	Medium	Implement mitigation measure HR1-7 and HR9	Low
Livelihoods	• Additional employment opportunities on site arising from operational activity (direct and indirect) positively impacting livelihoods	Low (Positive)	Refer to EIA in Appendix I	Low (Positive)
Decision making systems	• Potential feeling of powerlessness or lack of means to have input or say during operations, negatively impacting decision-making systems	Low	Implement mitigation measure SE2	Low

13.2 Economic assessment

13.2.1Methodology

Direct impacts refer to the economic activity supported onsite by the Project during its construction or operational phase. Direct economic activity was based on IBIS World 2023 world reports and ABS Input Output tables. Indirect economic activity was estimated using Australian National Accounts Input Output tables 2020-21. Specifically, the multipliers for the Electricity Transmission in Australia and Electricity Distribution in Australia have been applied to determine indirect economic activity. It is important to note that these multipliers generally result in an overestimation of impacts.

Economic activity supported by the Project was assessed through an examination of output, employment, wages and gross value added. The economic impacts were assessed at the NSW state level for the following phases:

- Design and construction phase: is the economic activity generated/supported through the design and construction phase of the Project
- Operational phase (post-construction): is the economic activity generated/supported during and post-construction or operational phase.

The methodology used to estimate number of jobs was:

- Derived from the CIV for the Project to identify design and construction job years
- Provided by the Proponent for operations based on previous experience in the industry.

13.2.2Existing Environment

The economic contribution that the Project Site currently generates is referred to as the base case. Currently, the Project Site supports 26 full-time equivalent jobs, four of which are directly generated on the Project Site. The existing land use generates a total of $5.1 million in generated and supported output, and a total of $1.6 million in generated and supported wages. The gross value added to the NSW economy each year is $5 million.

13.2.3Potential Impacts

Construction

The Project would have a direct impact on construction output as well as stimulating other industries which assist in production.

The gross value-added measures the contribution of a particular industry to gross regional product, and is calculated by subtracting the costs of inputs from the value of outputs. Design and construction would directly contribute approximately $12 million to the NSW economy.

The economic implications during the construction phase of the Project are summarised in Table 13-3.

Table 13-3: Construction phase economic impact summary

Performance indicator	Direct effects	Production induced effects	Consumption induced effects	Total
Employment (job years)	81	125	92	298
Output ($)	37,000,000	42,000,000	28,000,000	107,000,000
Remuneration ($)	6,000,000	10,000,000	7,000,000	23,000,000
Gross value added ($)	12,000,000	18,000,000	15,000,000	44,000,000

Operation

The net increase in economic activity supported on the Project Site during the operation phase is summarised in Table 13-4.

Table 13-4: Operation phase net economic impact summary

Impact metric	Direct	Indirect	Total
Employment (full-time equivalent)	1	6	7
Gross output ($/annum)	500,000	800,000	1,300,000
Remuneration ($/annum)	100,000	300,000	400,000
Gross value added ($/annum)	400,000	900,000	1,300,000

13.3 Mitigation measures

Table 13-5 summarises the mitigation measures for managing social and economic impacts during construction and operation of the Project.

Table 13-5: Social and economic mitigation measures

ID	Mitigation Measures
Construction	
SE1	Undertake community and stakeholder engagement in the lead up to and during construction of the project. This would help to ensure that: • The community and stakeholders have a high level of awareness of all processes and activities • The community and stakeholders are made aware of any potential disturbances and/or disruptions well in advance of them occurring. • Accurate and accessible information is made available. • A timely response is given to issues and concerns raised by the community. • Feedback from the community is encouraged. • Opportunities for input are provided.
Operation	
SE2	A transparent process for resolving complaints by neighbours and community members will be implemented. This process will be transparent and with clear timeframes for resolution of matters.

14 Waste Management

14.1 Methodology

The waste management assessment was prepared with reference to the following plans/policies/guidelines:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA 2014)
- NSW Waste Classification Guidelines (EPA 2014)
- *Waste Avoidance and Resource Recovery Act 2001.*

A desktop assessment was undertaken, which included the following tasks:

- Identifying potential waste generating activities during construction and operation
- Identifying waste management options for key waste types
- Providing measures to avoid, reduce and manage wastes in accordance with the waste hierarchy.

14.2 Likely waste streams for the Project

The construction and operation of the BESS will generate waste from a variety of sources and activities. Waste will be managed where feasible, in accordance with the hierarchy of priorities for the efficient use of resources, which is consistent with the objectives of the *Waste Avoidance and Resource Recovery (WARR) Act 2001*. The waste hierarchy is as follows (EPA, 2022):

- **Avoidance**: Including action to reduce the amount of waste generated by households, industry and all levels of government
- **Resource recovery**: Including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
- **Disposal**: Including management of all disposal options in the most environmentally responsible manner.

Types of waste generated for construction and operation of the BESS is presented in Table 14-1. The life of the BESS units is approximately 20 years, during this time various components of the BESS may require maintenance or replacement.

The lithium-ion batteries are expected to be returned to the supplier or a suitably licenced processing facility for recycling, repurposing, or appropriate disposal at a licenced facility. These materials will be managed in accordance with the waste management measures which will be prepared as part of the OEMP.

Table 14-1: Estimates of waste streams generated during construction and operation

Waste Type	Description	Proposed management
Construction		
Construction waste	Packaging, timber, drums, waste concrete, scrap metal, plastic wrapping, plasterboard and cables	Removed off-site to return to suppliers or recycling contractors where feasible
Hazardous and chemical materials	Adhesives, lubricants, waste fuel and oil, engine coolant, batteries, hoses and tyres from the	Off-site disposal at an appropriately licenced facility

Waste Type	Description	Proposed management
	maintenance of construction plant, vehicles and equipment, spill from construction vehicles and equipment	
Excavated material	Natural rock, soils and clay excavated during earthworks	Excavated material to be reused on-site for construction fill where possible
Recyclables from activities at construction compounds and site office(s)	Paper, carboard, plastics, glass, printer cartridges	Recycling contractors
General waste	Foods scraps and other putrescibles which are not recyclable	Off-site disposal at an appropriately licenced facility
Sewage and greywater from washdown activities and staff amenities	Sewage and greywater from staff amenities, dust suppression and washdown activities.	Existing Sydney Water sewage connection and trade agreement Off-site disposal at an appropriately licenced facility
Operation		
Battery units	Lithium-ion batteries and battery components replacement / maintenance	Returned to the supplier for repurposing or appropriate disposal at a licenced facility
Recyclables from activities at site office	Paper, carboard, plastics, glass, printer cartridges	Recycling contractors
Hazardous and chemical material	Used spill kit consumables	Off-site disposal at an appropriately licenced facility
Sewage and greywater from washdown activities and staff amenities	Sewage and greywater from staff amenities, dust suppression and washdown activities.	Off-site disposal at an appropriately licenced facility
Stormwater systems	Sediment removed from stormwater treatment devices and stormwater management systems.	Off-site disposal at an appropriately licenced facility if required or reused onsite where feasible.

14.3 Mitigation Measures

Table 14-2 summarises the mitigation measures for managing waste during construction and operation of the Project.

Table 14-2: Waste mitigation measures

ID	Mitigation Measures
Construction	
W1	All materials requiring removal from the Project Site will be classified in accordance with the *NSW EPA (2014) Waste Classification Guidelines*. Where required, material will be transported from the Project Site to an appropriately licensed landfill for disposal, or to an appropriately licenced recycling facility.
W2	The resource management hierarchy principles established under the WARR Act of avoid / reduce / reuse / recycle / dispose will be applied where feasible.
W3	Waste management measures will be included in the CEMP, detailing appropriate procedures for waste management in accordance with the waste management hierarchy.
W4	Wastes will be appropriately transported, stored and handled in accordance with NSW EPA waste classification and in a manner that prevents pollution of the surrounding environment.
W5	The handling and management of special wastes will be carried out in accordance with relevant legislation, codes of practice and Australian standards.
W6	A Waste Register will be maintained for the duration of construction. The register will detail the type of waste, volume/quantity of waste and recycle/disposal options.
W7	Working areas will be maintained, kept free of rubbish, and cleaned up at the end of each working shift.
Operation	
W8	A decommissioning plan will be prepared prior to the removal of project components.
W9	Waste will be managed and disposed of in accordance with the relevant applicable legislation, policies and guidelines, including the WARR Act and the NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA 2014).

15 Visual Amenity

This chapter of the EIS provides an assessment of the potential visual amenity impacts associated with the Project. A summary of the relevant SEARs and where they are addressed in this section is provided in Appendix A.

15.1 Methodology

The visual impact of the Project was assessed based on the following key steps:

- **Viewpoint identification**: A review of the applicable guidelines and a desktop analysis of the surrounding area was undertaken to identify areas that would potentially be subject to visual impacts as a result of the Project. Based on this assessment, viewpoints (as provided in Table 15-3 and Figure 15-1) were selected on the basis of:
  - Public locations surrounding the Project Site potentially subject to views of the Project. This was related to proximity and/or elevation
  - Representation of the range of viewer types in the area.
- **Site inspection**: Through a site inspection, the relevance of the locations identified in the previous step could be validated. Photographs were taken from key viewpoints and are presented in Section 15.3.
- **Assessment of visual impact**: The visual impact from the key viewpoints was then assessed qualitatively based on prescribed assessment criteria. This included identification of the sensitivity of the viewer and the magnitude of the modification to the view created by the Project.

For each viewpoint, these criteria were addressed under three categories, described in Table 15-1 below.

Table 15-1: Visual impact assessment criteria

Criteria	Description
Visual sensitivity	Visual sensitivity refers to the susceptibility of a view to accommodate change without losing valued attributes. The values of a view refer to any aspect of landscape or views people consider to be important. Visual sensitivity depends on the distance between the viewer and a development, the category of the viewer (e.g. resident, worker, open space user) and the importance of the view (e.g. is it a view people deliberately seek out). In general, views can be classified as: • High sensitivity: Locations where the quality of view is important to the viewer, there is a sustained duration of view and/or large numbers of viewers (e.g. public look-out spots) • Moderate sensitivity: Locations where the quality of view is important to the viewer, but the duration of views and/or number of viewers are lower than high sensitivity views (residential communities with direct view) • Low sensitivity: Locations where the quality of view is not particularly important to the viewer (e.g. industrial areas with employees focused on work).

Criteria	Description
Magnitude of visual change	The magnitude of visual change refers to the scale of the Project and the extent and proximity of the view to it. The four levels of magnitude used in the assessment are as follows: • High magnitude: Considerable or uncharacteristic modification to the visual setting • Moderate magnitude: Prominent but not substantially uncharacteristic modification to the visual setting • Low magnitude: Minimal alteration and modification consistent with the existing visual setting • Negligible magnitude: No discernible change to the existing visual setting.
Visual impact	The visual impact is a result of the visual sensitivity and the visual modification and is summarised on a qualitative basis. The resulting overall visual impact rating for each viewpoint was then determined using the assessment matrix presented in Table 15-2 below.

Table 15-2: Overall impact rating as a combination of visual sensitivity and visual adaption

		Magnitude of visual change			
		High	**Moderate**	**Low**	**Negligible**
Visual sensitivity	**High**	High	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible

15.2 Existing environment

The Project Site is located within an existing industrial area, known as the Smithfield Recycling and Manufacturing Precinct, and is accessed via Herbert Place, a 40 km/hr dual lane local road.

The Project Site is bounded to the south, west and east by the Visy site, a paper and plastics sorting and recycling facility. Kingspan Insulation is located to the north and includes a large carparking area and a warehouse used for assembly, service and storage of retail and commercial water tanks.

The nearest residential receivers to the Project Site are located in the suburbs of Smithfield and Guildford West. The nearest residential receiver is located around 400 metres south of the Project Site.

The Project Site is an existing electricity generating asset which includes 40 metre high power trains and 12 metre high noise walls along the south, southeast and west of the Project Site.

15.3 Potential impacts

15.3.1Construction

During construction, construction traffic would access the Project Site via the Herbert Place. Parking for construction workers would be within and adjacent to the Project Site.

The main construction activities would include site enabling works, vehicle movement, and preparation for operation, which would include the following main visual activities:

- Delivery of equipment for civil works within the Project Site
- Earthworks, levelling, and other civil and ground preparation activities
- Stockpile of excavated materials and use of laydown areas
- Movement of plant and equipment such as trucks, forklifts, excavators, and mobile crane
- Installation and electrical fit-out for the Project, including control building, battery enclosures, inverters, transformers and associated cabling and infrastructure
- Use of construction compound including a site office and amenities
- Testing and commissioning.

Visual impacts from the construction of the Project are likely to be low due to the temporary nature and industrial setting in which heavy vehicles and plant and equipment are used.

15.3.2Operation

Typical BESS model dimensions are provided in Section 4.2 and are expected to be up to 3m high. Given the size of these units, operation of the Project would generally be consistent with the visual built form and visual character of the SEF and is not anticipated to result in substantial visual impacts to the surrounding receivers.

Night lighting for the BESS facility will be located at the Project Site for security purposes. Night lighting will be designed to ensure that there is minimal impact on surrounding receivers consistent with the night lighting standards.

The viewpoint locations selected for the visual impact assessment are identified in Table 15-3 and Figure 15-1.

Table 15-3: Viewpoints surrounding the Project Site

ID	Location	Type	Reason for selection	Distance
01	31 Chisholm Street, Smithfield	Residential	Nearest residential receiver to the Project Site	400 m
02	6 Low Street, Smithfield	Residential	Nearby residential receiver to the southwest	450 m
03	3 Herbert Place, Smithfield	Industrial	Nearest industrial receiver to the Project Site	30 m
04	1 Herbert Place, Smithfield	Industrial	Nearby industrial receiver to the northwest	50 m
05	McCredie Road	Industrial	Nearby industrial receivers to the east	120 m

Figure 15-1: Viewpoints surrounding the Project Site

15.3.2.1 Viewpoint 1

Visual sensitivity – Moderate

Viewpoint 1 (V1) is located in front of 31 Chisholm Street, Smithfield NSW 2164. This viewpoint represents residential views south of the Project Site. There are number of residential viewers and recreation areas along Prospect Creek. Therefore, this viewpoint is of moderate sensitivity.

Magnitude of visual change – Negligible

This location is slightly lower in elevation in comparison to the Project Site. The BESS facility is located approximately 400 metres from the residential receivers and recreation areas along Prospect Creek. Given the dense vegetation along Prospect Creek, the Visy Site located north of Prospect Creek and the SEF southern noise wall, the Project would not be visible.

Based on a moderate sensitivity and negligible magnitude, this viewpoint would be subject to a negligible visual impact.

Figure 15-2: Viewpoint 1

Vegetation along Prospect Creek screens the view from the residential area to the Project Site. The Visy Site (not visible in the view) is located north of the vegetation and provides further screening and buffer to the Project Site.

15.3.2.2 Viewpoint 2

Visual sensitivity – Moderate

Viewpoint 2 (V2) is located in front of 6 Low Street, Smithfield NSW 2164. This viewpoint represents residential views southwest of the Project Site. There are number of residential viewers and recreation areas along Prospect Creek. Therefore, this viewpoint is of moderate sensitivity.

Magnitude of visual change – Negligible

This location is at a similar elevation in comparison to the Project Site. The BESS facility is located approximately 450 metres from the residential receivers and recreation areas along Prospect Creek. Given the dense vegetation along Prospect Creek, the Visy Site located north of Prospect Creek and the SEF eastern noise wall, the Project would not be visible.

Based on a moderate sensitivity and negligible magnitude, this viewpoint would be subject to a negligible visual impact.

Figure 15-3: Viewpoint 2

Vegetation along Prospect Creek screens the view from the residential area to the Project. The noise wall of the SEF (not visible in the view) is located northeast of the vegetation and provides further screening to the Project Site.

15.3.2.3 Viewpoint 3

Visual sensitivity – Low

Viewpoint 3 (V3) is located in front of 3 Herbert Place, Smithfield NSW 2164. This viewpoint represents the nearest neighbouring industrial views north of the Project Site. There are number of industrial viewers on Herbert Place where the quality of view is not particularly important to the viewer (e.g. employees focused on work). Therefore, this viewpoint is of low sensitivity.

Magnitude of visual change – Low

This location is at a similar elevation in comparison to the Project Site. The BESS facility is located adjacent to this property. Given the existing electrical infrastructure within the area including the overhead transmission line and the SEF, the alteration would be consistent with the existing visual setting. Signage would also be viewed from this viewpoint.

Based on a low sensitivity and low magnitude, this viewpoint would be subject to a low visual impact.

Figure 15-4: Viewpoint 3

The Project would be located within the SEF (in place of the four cell cooling towers). Neighbouring industrial receivers would see the Project, however given the existing electrical infrastructure within the area (overhead transmission, power trains) the alteration would be consistent with the existing visual setting. The northern boundary fence would screen part of the Project from this viewpoint.

15.3.2.4 Viewpoint 4

Visual sensitivity – Low

Viewpoint 4 (V4) is located in front of 1 Herbert Place, Smithfield NSW 2164. This viewpoint represents the industrial views of the Project Site from Herbert Place. There are number of industrial viewers on Herbert Place where the quality of view is not particularly important to the viewer (e.g. employees focused on work). Therefore, this viewpoint is of low sensitivity.

Magnitude of visual change – Low

This location is at a similar elevation in comparison to the Project Site. Given the existing electrical infrastructure within the area including the overhead transmission line and the SEF, the alteration would be consistent with the existing visual setting.

Based on a low sensitivity and low magnitude, this viewpoint would be subject to a low visual impact.

Figure 15-5: Viewpoint 4

The Project would be located within the SEF (in place of the four cell cooling towers). Neighbouring industrial receivers would see the Project, however given the existing electrical infrastructure within the area (overhead transmission, power trains) the alteration would be consistent with the existing visual setting. The northern boundary fence would screen most of the Project from this viewpoint.

15.3.2.5 Viewpoint 5

Visual sensitivity – Low

Viewpoint 5 (V5) is located at the cul-de-sac on McCredie Road, Smithfield NSW 2164. This viewpoint represents the industrial views of the Project Site from the east. There are number of industrial viewers on McCredie Road where the quality of view is not particularly important to the viewer (e.g. employees focused on work). Therefore, this viewpoint is of low sensitivity.

Magnitude of visual change – Negligible

This location is at a similar elevation in comparison to the Project Site. Given the existing electrical infrastructure within the area including the overhead transmission line and the SEF, the alteration would be consistent with the existing visual setting. The vegetation along the Kingspan property screens the Project Site.

Based on a low sensitivity and negligible magnitude, this viewpoint would be subject to a negligible visual impact.

Figure 15-6: Viewpoint 5

Vegetation along the Kingspan property would screen visual changes from neighbouring industrial receivers on McCredie Road.

15.4 Mitigation measures

The Project Site has been determined to have either a negligible or low impact on visual amenity (including night lighting) at viewpoints. Table 15-4 outlines the mitigation measures that would be implemented to minimise any visual amenity impacts.

Table 15-4: Visual amenity mitigation measures

ID	Mitigation Measures
Operation	
V1	Cut off and direct light fittings (or similar technologies) would be used where appropriate to minimise glare and night light spill onto private property
V2	External lighting design would be consistent with AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace, Part 5: Outdoor workplace lighting and AS 4282-1997 Control of the obtrusive effects of outdoor lighting.

16 Air Quality

16.1 Methodology

A qualitative air quality impact assessment was undertaken to determine the potential air quality impacts associated with the construction, operation, decommissioning and rehabilitation of the Project. This assessment included:

- Review of the existing environment
- Identification of construction activities which may lead to emissions
- Identification of nearby sensitive receivers
- Identification of mitigation measures to manage air quality impacts.

16.1.1 Applicable guidelines and legislation

The air quality assessment was prepared with reference to the following plans/policies/guidelines:

- The POEO Act sets the statutory framework for managing air quality in NSW, including establishing the licensing scheme for major industrial premises and offences and penalties for a range of air pollution issues. The Act is supported by the *Protection of the Environment Operations (General) Regulation 2022*.
- The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) lists the statutory methods to be used for modelling and assessing emissions of air pollutants in NSW EPA 2022 supersedes the 2016 version and took effect on 9 September 2022.
- The NSW Government is also a signatory to the *National Environment Protection (Ambient Air Quality) Measure* (NEPC, 2021) (AAQ NEPM) which sets out the standards for six key air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), ozone (O_3) and particulates of aerodynamic diameter <10 µm and <2.5 µm (PM_{10} and $PM_{2.5}$). The AAQ NEPM was established by the National Environmental Protection Council and has been varied several times since inception in 1998, with the most current variation taking effect on 18 May 2021.

16.1.2 Ambient air quality criteria

The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) prescribes the impact assessment criteria for NSW. These are replicated in Table 16-1.

Table 16-1: Impact assessment criteria for pollutants (EPA, 2022)

Pollutant	Averaging period	Concentration		Source
Sulfur dioxide (SO_2)	1 hour	10 pphm [a]	286 µg/m^3	NEPC (2021)
	1 hour	7.5 pphm [b]	215 µg/m^3	NEPC (2021)
	24 hours	2 pphm	57 µg/m^3	NEPC (2021)
Nitrogen dioxide (NO_2)	1 hour	8 pphm	164 µg/m^3	NEPC (2021)
	Annual	1.5 pphm	31 µg/m^3	NEPC (2021)

Pollutant	Averaging period	Concentration		Source
Photochemical oxidants (as ozone)	8 hours	6.5 pphm	139 µg/m^3	NEPC (2021)
Lead	Annual	–	0.5 µg/m^3	NEPC (1998)
PM2.5	24 hours	–	25 µg/m^3	NEPC (2021)
	Annual	–	8 µg/m^3	NEPC (2021)
PM10	24 hours	–	50 µg/m^3	NEPC (2021)
	Annual	–	25 µg/m^3	NEPC (2021)
Total suspended particulates (TSP)	Annual	–	90 µg/m^3	NHMRC (1996)
Deposited dust [e]	Annual	2 g/m^2/month [c]	4 g/m^2/month [d]	NERDDC (1988)
Carbon monoxide (CO)	15 minutes	87 ppm	100 mg/m^3	WHO (2000)
	1 hour	25 ppm	30 mg/m^3	WHO (2000)
	8 hours	9 ppm	10 mg/m^3	NEPC (2021)
Hydrogen fluoride	90 days	0.5 µg/m^3 [f]	0.25 µg/m^3 [g]	ANZECC (1990)
	30 days	0.84 µg/m^3 [f]	0.4 µg/m^3 [g]	ANZECC (1990)
	7 days	1.7 µg/m^3 [f]	0.8 µg/m^3 [g]	ANZECC (1990)
	24 hours	2.9 µg/m^3 [f]	1.5 µg/m^3 [g]	ANZECC (1990)

Notes

a. This impact assessment criterion applies to assessments prepared before 1 January 2025

b. This impact assessment criterion applies to assessments prepared after 1 January 2025

c. Maximum increase in deposited dust level

d. Maximum total deposited dust level

e. Dust is assessed as insoluble solids as defined by AS 3580.10.1–1991 (AM-19)

f. General land use, which includes all areas other than specialised land use

g. Specialised land use, which includes all areas with vegetation sensitive to fluoride, such as grapevines and stone fruits

16.2 Existing environment

16.2.1Sensitive receivers

The Project Site is located in an industrial setting with the nearest sensitive receivers being:

- An industrial receiver located 30 metres southeast of the Site.
- An industrial receiver located 40 metres north of the Site.
- Two Industrial receivers located 60 metres south and west of the Site respectively.

16.2.2Emission sources

The Smithfield area and surrounding suburbs are characterised by general industrial land uses which have a considerable influence on the local and regional air quality. Sources of industrial emissions close to the Project Site include:

- CSR Gyprock – Wetherill Park
- VISY Beverage Smithfield
- Dunlop Foams

The National Pollutant Inventory (NPI) is maintained by the DCCEEW and contains emission estimates for 93 toxic substances which can affect human health and the environment. The inventory includes the source and location of these emissions. A review of the NPI was undertaken to identify the types and sources of emissions within the Smithfield area for the 2021-2022 reporting year.

The search indicated that the existing air quality in Smithfield is primarily influenced by emissions from manufacturing industries. Thirty-seven substances were identified as being emitted by local industry.

The most common substances include:

- Carbon monoxide
- Oxides of nitrogen
- Total volatile organic compounds
- PM_{10}
- $PM_{2.5.}$

Other emission sources in the locality include service stations, motor vehicles, domestic wood fires, railways, lawn mowing, domestic/commercial solvents and aerosols, windblown dust and bushfires.

16.2.3Ambient air quality

A review of Air Quality Data Services (DPE, 2023) was undertaken to identify average particulates ($PM_{2.5}$ and PM_{10}) concentrations within the area. Prospect, the closest monitoring station approximately 8.4 kilometres northwest of the Project site, is considered representative of the Project area. Data for the period July 2019 and May 2023 was reviewed.

As shown in Figure 16-1, the PM_{10} and $PM_{2.5}$ concentrations for the period between September 2019 and March 2020 were considerably higher than the rest of the records for the period 2019-2023, and correlate with the Black Summer bushfires.

For the period 2019-2023, monthly PM_{10} concentrations average 18.6 µg/m^3 (below the annual criterion of 25 µg/m^3), while monthly $PM_{2.5}$ concentrations average 7.9 µg/m^3 (below the annual criterion of 8 µg/m^3)

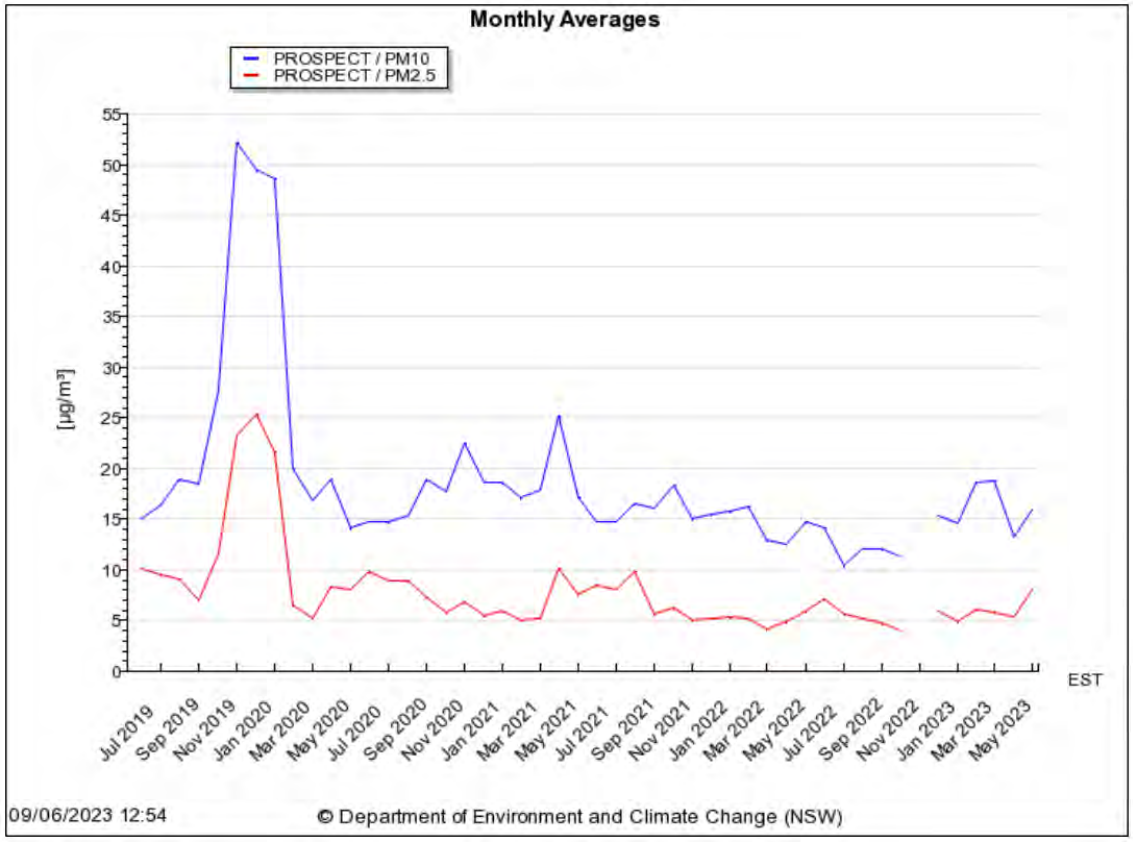


Figure 16-1: Measured PM10 and PM2.5 concentrations – Prospect, 2023 (DPE, 2023

16.3 Potential impacts

16.3.1Construction

The most likely impacts to air quality during construction of the Project relate to potential fugitive dust emissions from earthworks and emissions from construction vehicles, plant and equipment. The construction period would be approximately 12 months.

Construction activities that may result in the generation of dust and emissions include:

- Earthworks and levelling
- Stockpiling of excavated material
- Stockpiling and placement of material for site preparation activities
- Construction of fencing and site access
- Excavations for footings, potential underground cabling and electrical infrastructure
- Construction of ancillary infrastructure.

The Project Site generally comprises of sealed roads and hardstands, therefore fugitive dust emissions from construction would be considered negligible and can be appropriately managed with the implementation of a construction environmental management plan.

Other emissions from construction vehicles, plant and equipment are considered negligible in the context of the industrialised nature of the surrounding area.

Additionally, given the short term and temporary nature of construction works, the Project unlikely to have a significant impact on the local air quality during construction. Potential impacts during construction will be managed with the implementation of the proposed mitigation measures listed in Section 16.3.3.

16.3.2Operation

Operation of the BESS will not result in any emission of particulates or other pollutants. Dring operation, staff movements are estimated to be up to five vehicles per day and would have a negligible impact on local air quality.

Decommissioning and rehabilitation of the project is expected to produce similar or less emissions and impact than construction. Therefore, these emissions and impacts have not been further assessed.

16.3.3Mitigation measures

Table 16-2 summarises the mitigation measures for managing air quality issues during construction and operation of the Project.

Table 16-2: Air quality mitigation measures

ID	Mitigation Measures
Construction	
AQ1	Reasonable and feasible dust suppression will be implemented during construction activities to minimise fugitive dust emissions.
AQ3	All vehicles transporting materials to and from the Project Site will be covered and secured.
AQ4	Speed limits on the site will be established and enforced during construction.
AQ5	All plant and equipment will be inspected before it is used on-site and maintained in accordance with manufacturers specifications and would comply with relevant vehicle emission standards, where applicable.
AQ6	All plant and equipment will be switched off when not in use for extended periods.
AQ7	Air quality measures will be included in the CEMP.
AQ8	Dust and air quality complaints will be managed in accordance with the overarching complaints handling process for the Project. Appropriate corrective actions; if required, will be taken to reduce emissions in a timely manner.
Operation	
AQ9	Speed limits on the site already exist and will continue to be enforced.
AQ10	Maintain plant and equipment in good condition to minimise ignition risk of fuel or chemicals, spills and air emissions that may cause nuisance.

17 Other

This chapter provides an overview of other environmental matters for those environmental aspects that, based on existing information and assessment would not result in adverse impact and require limited mitigation. These matters, the assessment methodology and potential impacts are summarised in Table 17-1.

Table 17-1: Other impacts summary

Environmental matter	Methodology	Existing environment	Potential impacts
Biodiversity	A detailed overview of the methodology undertaken to assess potential biodiversity impacts can be found in the Appendix D of the Smithfield BESS Scoping Report (BDAR Waiver Application). The methodology included desktop review, database searches, site inspection and two dusk fly out surveys.	The Project Site is in a highly urbanised environment and has no native vegetation cover. Small patches of *Taraxacum officinale* (Common Dandelion) sporadically appear in the gravel substrate. Potential microbat habitat was identified on-site. However, the habitat would not be suitable for threatened microbat species as it fails to facilitate the movement required to maintain their lifecycle.	Construction of the Project would occur on land that is cleared of vegetation. No vegetation removal is proposed. Potential construction impacts to biodiversity may include the introduction and spread of noxious weeds and other invasive species and impacts to downstream waterways if construction water is not managed. Once the site is operational, there is unlikely to be any adverse impacts to biodiversity. Following receipt of the BDAR Waiver Application, a BDAR Waiver approval was granted as the development is not likely to have a significant impact on biodiversity values. The BDAR Waiver approval is attached in Appendix J.
Bushfire	Desktop review involving review of NSW Rural Fire Service and Cumberland Local Environmental Plan registers and mapping.	The Project Site is not mapped as bushfire prone land, with the nearest bushfire prone land being located over 3.5 km northwest of the Project Site.	Given the Project Site is located within an industrial area that has been highly disturbed and cleared of vegetation, and is not mapped as bushfire prone land, the risk of bushfires is considered low.
Aboriginal heritage	A search of the DPE Aboriginal Heritage Information System (AHIMS) database was undertaken on 8 February 2023 to identify known areas of Aboriginal significance in proximity to the Project Site.	The search identified no items of Aboriginal heritage significance within one kilometre of the Project Site	The Project Site and immediate surrounds have been heavily disturbed due to the industrial nature of the surrounding land use. Therefore, it is considered highly unlikely that any Aboriginal items would be uncovered during construction of the Project. Any unexpected finds would be managed by the standard unexpected finds protocol.
Non-Aboriginal Heritage	Desktop review involving review of the State Heritage Register, Transport and Sydney Waters' Section 170 Heritage and Conservation Registers, and Cumberland Local Environmental Plan registers and mapping	The search identified no items of Aboriginal heritage significance within one kilometre of the Project Site	The Project Site and immediate surrounds have been heavily disturbed due to the industrial nature of the surrounding land use. Therefore, it is considered highly unlikely that any non-Aboriginal heritage items would be uncovered during construction of the Project. Any unexpected finds would be managed by the standard unexpected finds protocol.

Table 17-2 summarises the mitigation measures for managing these other aspects during construction and operation of the Project.

Table 17-2: Other mitigation measures

ID	Mitigation Measures
Construction	
B1	Biodiversity measures will be included in the CEMP to ensure that runoff from the Project Site is managed to prevent the spread of noxious weeds and other invasive species.
H1	An unexpected finds protocol will be prepared and included in the CEMP. This protocol will outline the procedure for managing the identification of items of potential heritage significance during construction.

18 Cumulative Impacts

18.1 Introduction

Cumulative impacts result from incremental, sustained or combined effects of an activity or project when added to other current, planned, or reasonably anticipated future impacts (DPE, 2022). The extent to which another development or activity could interact with the construction or operation of the Project would depend on its scale, location and timing.

18.2 Methodology

A desktop review of government planning portals was undertaken on 23 August 2023 to identify proposed or approved developments in the vicinity of the Project having the potential to result in cumulative impacts. The desktop review included:

- Developing screening criteria that would be used to determine whether a project should be assessed for cumulative impacts
- Identifying projects that could potentially result in cumulative impacts during the construction and operation of the Project
- Applying the screening criteria to determine which projects should be taken forward to the cumulative impact assessment
- Identifying potential impacts of the above projects where known
- Assessing whether the impacts of the Proposal would combine with the impacts of these projects to create a cumulative effect
- Assessing whether management and mitigation measures considered in this EIS would be sufficient to manage impacts, or need modifying or supplementing.

18.2.1 Screening Criteria

Screening criteria were developed, as shown in Table 18-1. These criteria were applied to determine whether each development that may have the potential to result in a cumulative impact with the Project should be included in the cumulative impact assessment. Projects that satisfied at least one of the triggers in each of the screening criteria in Table 18-1 were included in the cumulative impact assessment.

Table 18-1: Screening criteria for cumulative impact assessment

Criteria	Triggers
Location A development was considered relevant for consideration where it met one of the triggers	Direct overlap: construction footprint(s) intersect with the Project
	In the vicinity: within one kilometre of the construction footprint of the Project
Timeframe A development was considered relevant where it met one of the triggers	Concurrent construction programs
	Consecutive construction programs (less than 18 months between the Project and the development's construction program(s))
	Concurrent operational programs
Status A development was considered relevant where it was at one of the following stages of the statutory assessment and approval process	Approved projects (statutory approvals received), including approved projects that have not started construction, projects currently under construction, and recently completed projects
	Proposed projects (currently under statutory environmental impact assessment which includes where an application has been lodged)
Scale of potential impact A development was considered relevant where the project involved substantial impacts to one or more of the following	• Traffic and transport • Noise and vibration • Hazard and risk • Water quality, flooding and water use

18.2.2Identification of Projects

A search for the relevant surrounding projects was undertaken using the following databases:

- Cumberland City Council Development Application Register
- Fairfield City Council Development Application Register
- DPE Major Projects Planning Portal.

Projects within one kilometre of the Project were considered for the cumulative impact assessment and were measured against the triggers for the screening criteria identified in Table 18-1 .

Developments within one kilometre of the Project considered to have potential to result in cumulative environmental impacts with the Project are described in Section 18.3 and shown in Figure 18-1:.

18.3 Surrounding Developments

Table 18-2 identifies relevant proposed developments in the surrounding area that were identifies to meet the screening criteria outlined in Section 18.2.1. The Projects are described further in the following sections.

Table 18-2: Projects with potential to result in cumulative impacts

Database searched	Address	Development
DPE Major Projects Planning Portal	132-144 Warren Road, Smithfield	SSD-19425495 Smithfield Recycling Centre

18.3.1Smithfield Recycling Centre (SSD-19425495)

The EIS for the Smithfield Recycling Centre (SSD-19425495) (MRA Consulting Group, 2022) indicates that the proposed development seeks to use an existing warehouse to receive up to 150,000 tonnes per annum of domestic and commercial recyclable materials. The recycling centre would then sort these materials into categories for transportation to dedicated reprocessing facilities. The development is located around 300m from the Project Site and may utilise Herbert Place to provide Visy with offtake materials. As the development may be constructed or become operational concurrently with the construction or operation of the Project, the cumulative impacts of the Smithfield Recycling Centre development have been considered.

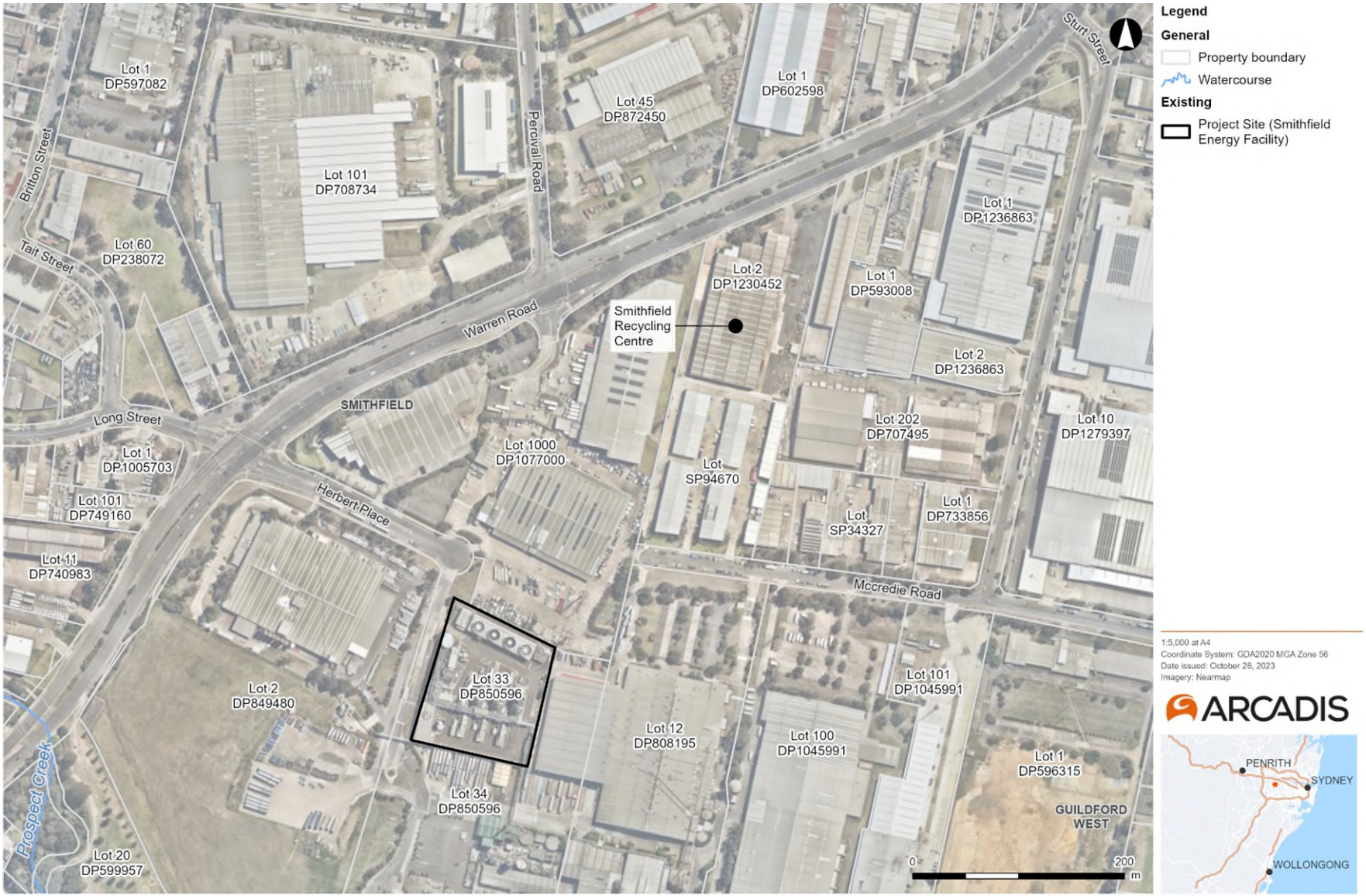


Figure 18-1: Surrounding developments with potential to result in cumulative impacts.

18.4 Potential Impacts

Given the nature of the environmental impacts outlined in this EIS and Smithfield Recycling Centre EIS, potential cumulative impacts are considered to be minimal or negligible. Construction of the Project is expected to take around 12 months to complete. This is considered to be a relatively short-term impact and cumulative impacts are not expected to be significant, given the location and scale of the Project.

Traffic was identified as having the greatest potential for cumulative impacts. Table 18-3 details the cumulative impact assessment with regards to these aspects for both construction and operational overlapping scenarios.

Table 18-3: Cumulative impact assessment

Aspect	Cumulative impacts
Traffic	The Smithfield Recycling Centre (SSD-19425495) (MRA Consulting Group, 2022) indicates that: • Construction is anticipated to take around 4 months. The site would be accessed during construction hours of 7am to 6pm weekdays and 7am to 1 pm on Saturdays. It would be expected that approximately 30 light vehicles and 2 trucks would access the site daily for construction and installation works • During operations, the total number of vehicular movements is 190 truck movement per day, 72 passenger vehicle movement per day and 4 visitor vehicle movement per day. The maximum number of trucks would occur in the late morning, between 11 am and 12 am. Traffic modelling for the worst case scenario (construction of the Project, overlapping with operation of the Smithfield Recycling Centre) has been incorporated into the model and is presented in Section 8.4.1 and Appendix C. Modelling results show there would be no change to the performance of the Cumberland Highway, Long Street, and Herbert Place intersection.

18.5 Mitigation measures

No substantial additional impacts or exceedances of criteria have been identified. Thus, the mitigation measures identified for the Project would effectively mitigate any cumulative impacts identified within this chapter.

19 Environmental Management

The EIS for the Project has identified a range of environmental impacts and recommended management and mitigation measures to avoid, mitigate or remedy these impacts (refer to Chapters 8 to 18 of this EIS).

A high-quality detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development is provided in Figure 19-1.

Table 19-1 presents a summary of the mitigation measures (excluding mitigation measures that are built into the physical layout and design of the Project and captured in the project description) which Iberdrola is committed to implementing either prior to construction, during construction or during operation for the Project.

These mitigation measures may be revised in response to public submissions to the EIS or design changes following public exhibition of this EIS. It is envisaged that these mitigation measures will form the basis for the Conditions of Approval which would be provided for the Project, subject to successful approval.

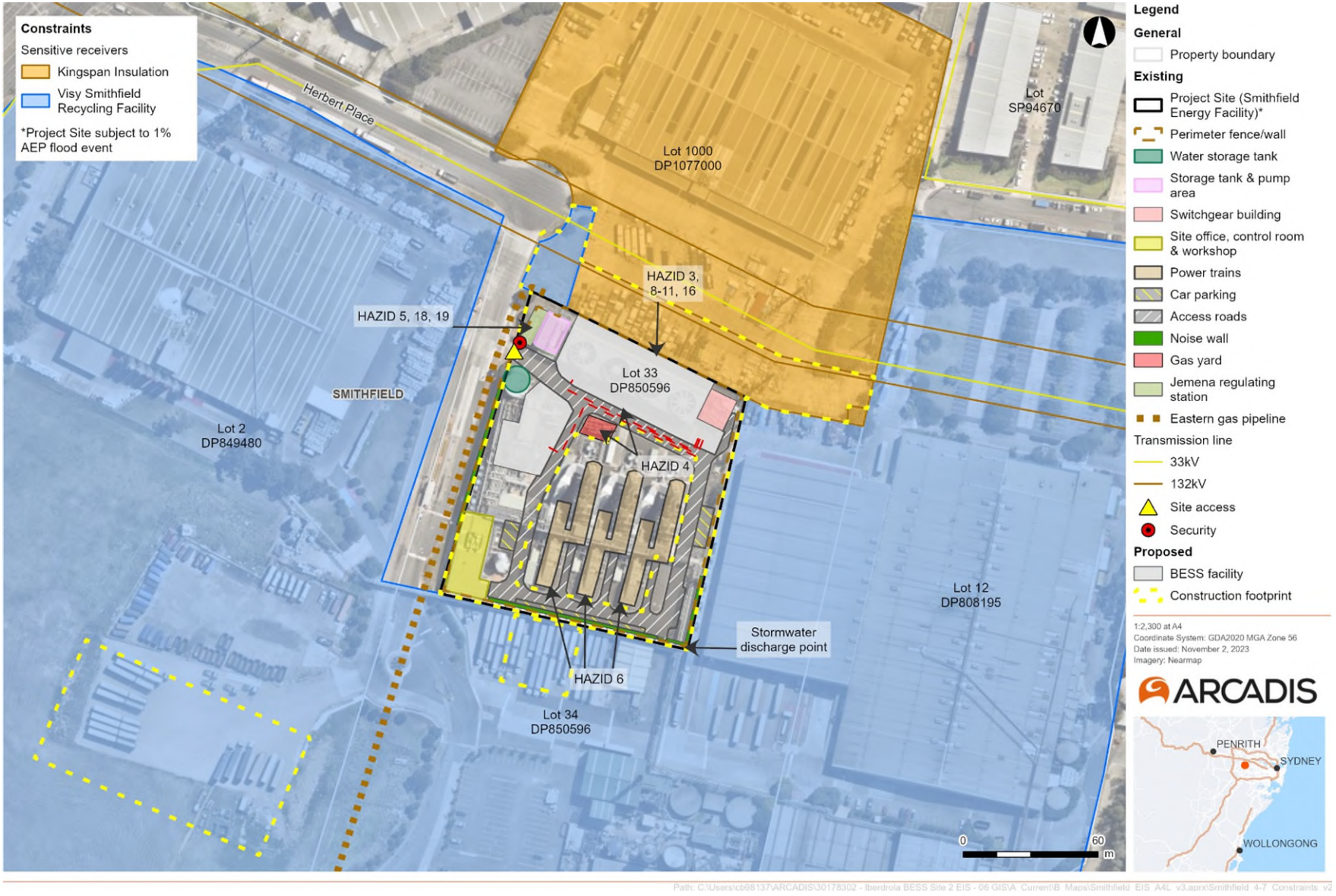


Figure 19-1: Constraints map

Table 19-1: Compilation of mitigation measures

ID	Mitigation Measures	Timing
Traffic and transport		
T1	Develop a CTMP, prior to construction, in consultation with the relevant road authority. Include, at a minimum, the following management measures: • Undertake consultation with the relevant road authorities and adjacent landowners during preparation of the CTMP. • A process for ongoing consultation with relevant authorities. • A process for managing OSOM deliveries. • Routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses. Secondary alternative construction route activities should be included, in the event of the primary route is blocked off by an emergency. • Identification of parking areas for the workforce to minimise impacts on sensitive land uses and businesses. • Implement measures to manage and facilitate the ingress/egress of the plant delivery truck to ensure safety for all users along Herbert Place, including, as required regulatory and direction signposting, variable message signs, traffic management personnel and all other traffic control devices necessary for the implementation of the CTMP. • Ensure the performance of project traffic arrangements is monitored during construction.	Pre-construction
T2	Induct employees and contractors to raise awareness and understanding of traffic and transport mitigation measures will be implemented during construction.	Construction
T3	To minimise the potential for parking disruptions, the following management hierarchy will be applied: • Existing parking within the SEF will be utilised. • Car parking will occur within the proposed construction compound. • In consultation with neighbouring landowners.	Construction

ID	Mitigation Measures	Timing
Noise and vibration		
NV1	Restrict noise-generating construction activities to the recommended standard hours of work: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturday • No work on Sundays or public holidays. Note certain activities may be required outside of the standard construction hours. Key stakeholders would be informed prior to out of hours activities. These activities potentially include: • Delivery of plant and equipment for safety reasons (e.g. OSOM vehicles) • Commissioning and testing activities that must align with demands on the grid • Emergency work to avoid damage to persons or property and/or to prevent environmental harm • Construction works where it can be demonstrated and justified that these works are required to be undertaken outside of standard construction hours.	Construction
NV2	Undertake and provide consultation avenues during construction including: • Notifying impacted receivers prior to works commencing • Maintaining community relations throughout construction period • Complaints handing through appropriate channels and response mechanism.	Construction
NV3	Worksite induction training and / or toolboxes will include education for workers on noise issues related to the Project Site and to be aware of the mitigation measures to be implemented.	Construction
NV4	Identify feasible and reasonable approaches to reduce noise and vibration impacts in the CEMP as per the NSW Department of Environment and Climate Change's I*nterim Construction Noise Guideline 2009.*	Pre-construction
NV5	The OEMP will include measures and processes for managing noise resulting from the operation of the Project. The OEMP should have consideration to: • The Noise Policy for Industry (EPA, 2017) • Approved methods for the measurement and analysis of environmental noise in NSW (EPA, 2021) • A process for managing complaints.	Pre-operation

ID	Mitigation Measures	Timing
NV6	A complaints procedure will be developed and captured to manage situations where nearby receivers perceive noise to be a problem. The procedure will contain the following as a minimum: • Responsibility for investigation into the complaint • Exploration of at-source mitigation if problem noise source identified • If required, noise monitoring at the complainant's property should be undertaken if a noise source if the complainant is not satisfied with the corrective action • Recording mechanism of all complaints and corrective actions. • Notification of potentially affected receivers if observations indicate that the noise criteria is being exceeded due to site activities. The affected receiver will be notified in writing of exceedances and the source of the impact in a prompt manner.	Pre-operation
Hazards and risk		
HR1	The BESS OEM will meet NFPA 855 or UL 9540A test performance requirements	Detailed Design
HR2	Review the investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) and implement relevant findings for the Project when finalising design and preparing for operations. The publicly available investigation reports include: • Energy Safe Victoria: Statement of Technical Findings on fire at the Victorian Big Battery • Fisher Engineering and Energy Safety Response Group: Report of Technical Findings on Victorian Big Battery Fire.	Detailed Design
HR3	Measures to minimise the offsite fatality potential from radiation and toxic gas effects from a full BESS module fire at the northern site boundary will be investigated during detailed design. Mitigation measures could include: • Setback of the BESS units as per the estimated PHA radiation fatality distances for the chosen BESS type • Fire wall (engineering measure) along the northern boundary • Orientation of BESS units to minimise radiation impact distance.	Detailed Design
HR4	Measures would be implemented to minimise the potential for a natural gas leak from the SEF towards the BESS modules. Mitigation measures could include: • Flange guards on the gas yard pipework • Vapour barrier along the gas yard.	Detailed Design
HR5	A Final Hazard Analysis will be undertaken for the chosen BESS type to confirm that the spacing and setback distances will minimise the potential for offsite radiation and toxic gas impacts from a BESS fire as well as incident propagation.	Detailed Design

ID	Mitigation Measures	Timing
HR6	A Fire Safety Study will be prepared to identify measures to eliminate the expansion of any fire incident.	Detailed Design
HR7	The final BESS layout will include the specified clearances recommended by the OEM.	Detailed Design
HR8	Prior to construction, a construction safety management study in accordance with Jemena protocols will be developed with participation from Jemena to further consider the credible threats and mitigation to the Eastern Gas Pipeline and regulating station, including consideration of AS4853 -Electrical Hazard Assessment.	Pre-construction
HR9	The existing SEF Emergency Response Plan will be updated to include consideration of: • How emergency services can safely access the northern site boundary and respond to a BESS fire and toxic gas (hydrogen fluoride) generation in this area • Communication and response to a BESS fire with the current neighbour, Kingspan on the northern site boundary.	Pre-operation
Land and contamination		
LC1	An Unexpected Finds Protocol will be included in the CEMP to manage any disturbance of material that is odorous, stained or containing anthropogenic materials, in the event these are encountered during construction.	Pre-construction
LC2	Should fill be identified at the location of the cooling towers, further sampling will be undertaken to address the data gap present and for waste classification	Construction
LC3	The OEMP prepared for the Project will include measures to manage any spills that occur during operation.	Pre-operation
Water		
W1	Where feasible the design of the Project will consider the following stormwater management principles: • Maintaining existing sub-catchment areas • Maintaining existing overland flow paths to the downstream • Maintaining existing drainage outlet connection to the downstream • Maximising pervious areas • Minimising fill, infrastructure and building footprints below the 1% AEP flood level • Ensuring potentially contaminated runoff is sufficiently collected and treated appropriately • Minimising potential contaminant sources on site, and where feasible ensuring any dangerous goods are stored above the 1% AEP flood level plus 500 mm freeboard.	Detailed Design

ID	Mitigation Measures	Timing
	The detailed design will meet applicable Australian standards and guidelines including the Australian Building Codes Board – Construction of buildings in flood hazard areas.	
W2	The detailed design will verify that flood impacts off-site are minimised and to confirm flood levels within the Project Site to inform the design. Project infrastructure will be elevated above flood levels in accordance with applicable industry standards and guidelines. For the batteries and electrical equipment these will be elevated above the 1% AEP flood level as a minimum. Non-habitable floor levels (such as the proposed additional switch room) will be located 0.15 metre above the 1% AEP flood level at a minimum where the 1% AEP flood depth is greater than 100 mm.	Detailed Design
W3	Sufficient safety measures (i.e., Battery Management System) will be incorporated into the design to prevent any risk of electrical current discharging during a flood event.	Detailed Design
W4	The detailed design will verify that the Project does not result in any increase to stormwater runoff peak flows discharging from the site for all design storm events up to the 1% AEP.	Detailed Design
W5	The existing water quality treatment measures and maintenance schedules will be reviewed during detailed design to verify the Project aligns with the existing stormwater strategy and avoid impacts on the downstream environment.	Detailed Design
W6	A Soil and Water Management Plan and Erosion and Sediment Control Plan (ESCP), or equivalent, would be incorporated into the CEMP. These plans would be developed and implemented in accordance with the principles and requirements of the Landcom 2004 Managing Urban Stormwater: Soils and Construction – Volume 1 (commonly known as the 'Blue Book'). The ESCP will be progressively updated to reflect the changing nature of the Project site as construction activities progress.	Pre-construction
W7	Inspection and monitoring of the erosion and sediment control measures and the internal SEF drainage network will be undertaken regularly throughout the construction period and following large rainfall events. Any increase in sediment loads resulting from construction activities may necessitate more frequent maintenance of the SEF drainage network, including the on-site detention tank and oil-water separators	Construction
W8	An incident response procedure will be prepared to manage the response for potential spills on-site. This may include closing off the isolation valve at the drainage outlet of the Project Site to prevent any stormwater discharge from the Project Site drainage network.	Pre-construction
W9	Project Site operational procedures will be reviewed and updated as required to ensure sufficient flood emergency management procedures are in place for the Project.	Pre-operation

ID	Mitigation Measures	Timing
Social and economic		
SE1	Undertake community and stakeholder engagement in the lead up to and during construction of the Project. This would help to ensure that: • The community and stakeholders have a high level of awareness of all processes and activities • The community and stakeholders are made aware of any potential disturbances and/or disruptions well in advance of them occurring. • Accurate and accessible information is made available. • A timely response is given to issues and concerns raised by the community. • Feedback from the community is encouraged. • Opportunities for input are provided.	Pre-construction
SE2	A transparent process for resolving complaints by neighbours and community members will be implemented. This process will be transparent and with clear timeframes for resolution of matters.	Operation
Waste management		
W1	All materials requiring removal from the Project Site will be classified in accordance with the *NSW EPA (2014) Waste Classification Guidelines*. Where required, material will be transported from the Project Site to an appropriately licensed landfill for disposal, or to an appropriately licenced recycling facility.	Construction
W2	The resource management hierarchy principles established under the WARR Act of avoid / reduce / reuse / recycle / dispose will be applied where feasible.	Construction
W3	Waste management measures will be included in the CEMP, detailing appropriate procedures for waste management in accordance with the waste management hierarchy.	Pre-construction
W4	Wastes will be appropriately transported, stored and handled in accordance with NSW EPA waste classification and in a manner that prevents pollution of the surrounding environment.	Construction
W5	The handling and management of special wastes will be carried out in accordance with relevant legislation, codes of practice and Australian standards.	Construction
W6	A Waste Register will be maintained for the duration of construction. The register will detail the type of waste, volume/quantity of waste and recycle/disposal options.	Construction
W7	Working areas will be maintained, kept free of rubbish, and cleaned up at the end of each working shift.	Construction
W8	Decommissioning plan will be prepared prior to the removal of project components.	Pre-decommissioning

ID	Mitigation Measures	Timing
W9	Waste will be managed and disposed of in accordance with the relevant applicable legislation, policies and guidelines, including the WARR Act and the NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA 2014).	Operation
Visual amenity		
V1	Cut off and direct light fittings (or similar technologies) would be used where appropriate to minimise glare and light spill onto private property.	Operation
V2	External lighting design would be consistent with AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace, Part 5: Outdoor workplace lighting and AS 4282-1997 Control of the obtrusive effects of outdoor lighting.	Operation
Air Quality		
AQ1	Reasonable and feasible dust suppression will be implemented during construction activities to minimise fugitive dust emissions.	Construction
AQ3	All vehicles transporting materials to and from the Project Site will be covered and secured.	Construction
AQ4	Speed limits on the site will be established and enforced during construction.	Construction
AQ5	All plant and equipment will be inspected before it is used on-site and maintained in accordance with manufacturers specifications and would comply with relevant vehicle emission standards, where applicable.	Construction
AQ6	All plant and equipment will be switched off when not in use for extended periods.	Construction
AQ7	Air quality measures will be included in the CEMP.	Pre-construction
AQ8	Dust and air quality complaints will be managed in accordance with the overarching complaints handling process for the Project. Appropriate corrective actions, if required, will be taken to reduce emissions in a timely manner.	Construction
AQ9	Speed limits on the site already exist and will be continue to be enforced.	Operation
AQ10	Maintain plant and equipment in good condition to minimise ignition risk of fuel or chemicals, spills and air emissions that may cause nuisance.	Operation
Biodiversity		
B1	Biodiversity measures will be included in the CEMP to ensure that runoff from the Project Site is managed to prevent the spread of noxious weeds and other invasive species.	Pre-construction
Heritage (Aboriginal and non-Aboriginal)		
H1	An unexpected finds protocol will be prepared and included in the CEMP. This protocol will outline the procedure for managing the identification of items of potential heritage significance during construction.	Construction

20 Ecologically Sustainable Development

This chapter outlines how the Project is consistent with the principles of ESD.

20.1 Existing environment

Australia's *National Strategy for Ecologically Sustainable Development*[2] *(1992)* defines ecologically sustainable development as '*using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased*'.

In NSW, the commitment to the concept of environmental sustainability is expressed in current legislation. It is an objective of the EP&A Act (section 1.3 (b)) to facilitate ESD by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment, through the implementation of the four principles of ecologically sustainable development. The four principles of ESD are defined in the EP&A Regulation (clause 193). They are:

- **Precautionary principle:** namely, is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

  (a) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
  (b) An assessment of the risk-weighted consequences of various options.

- **Inter-generational equality:** namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- **Conservation of biological and ecological integrity:** namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.
- **Improved valuation, pricing and incentive mechanisms**: namely, that environmental factors should be included in the valuation of assets and services, such as:
  - Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
  - The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
  - Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

An assessment of the Project's consistency with the principles of ESD has been undertaken, it evaluates how those principles have been considered and incorporated into the design, construction and operation of the Project.

[2] https://webarchive.nla.gov.au/awa/20130905024205/http://www.environment.gov.au/about/esd/publications/strategy/index.html

20.2 Assessment of Project consistency

20.2.1 The precautionary principle

The precautionary principle deals with certainty in decision making. It provides that if there are risks of serious or irreversible environmental damage associated with a proposed development, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle approach has been applied throughout the development of the Project and in the preparation of all technical studies associated with the Project. The main intent is to minimise any potential environmental impacts. This included identifying opportunities to avoid and minimise potential impacts to the surrounding environment and sensitive residential receivers. This is described in Chapter 3 (Project justification, need and alternatives). The Project Site has been selected in order to locate the BESS with existing energy dispatch infrastructure (i.e. the SEF). The Project Site is suitable for the proposed development and is consistent with other existing uses of the site.

This EIS details the evaluation of environmental impacts associated with the Project and was prepared by adopting a conservative approach which included assessing worst-case impacts and scenarios. It has been undertaken using the best available technical information and has adopted best practice environmental standards, goals and measures to minimise environmental risks. The environmental assessment has been undertaken in collaboration with key stakeholders and relevant statutory and agency requirements.

The risk of serious or irreversible environmental damage is the fundamental rationale for implementing the precautionary principle. Environmental risks associated with the Project were identified during the development of the EIS. Appropriate mitigation measures have been identified to ensure the minimum environmental impacts during design, construction, and operation of the Project and that no such impact results or serious or irreversible environmental damage. See Chapter 7 (environmental risk assessment) for more information.

Technical specialist studies that were undertaken to provide detailed information to assist with the assessment and development of the Project

The specialist studies identified that through the implementation of mitigation measures, the potential impacts of the Project will be appropriately managed. As a result, the Project would not cause serious and irreversible environmental damage. Mitigations measures are summarised in Chapter 1.

20.2.2 Inter-generational equity

Inter-generational equity refers to the premise that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The Project has been considered in terms of intergenerational equity through the management of potential environmental and social impacts discussed throughout this EIS.

As detailed in Chapter 3, NSW is undergoing an energy sector transformation which will change how energy is generated and used throughout the State. The need to increase the generation of renewable energy as some of the State's largest coal-fired power stations begin to close has been identified. The Project provides benefits to both existing and future generations through the provision of large-scale battery storage which is expected to contribute to the ability of the electricity grid to accommodate renewable energy sources (particularly wind and solar).

The mitigation measures provided in Chapter 1 of this EIS, in particular those relating to traffic and transport, noise and vibration, water quality and social and economic impact are reflective of the commitment of Iberdrola (as the Proponent) to ensuring that the Project does not adversely affect quality of the environment for future generations.

20.2.3Conservation of biological diversity and ecological integrity

This ESD principle stipulates that biological diversity and ecological integrity should be a fundamental consideration when assessing the impacts of a Project.

The Project is located within an existing industrial area within the Smithfield Recycling and Manufacturing Precinct. The Project Site has no native vegetation and proposed laydown areas would be either located on hardstand or on areas with maintained exotic grassland, with low habitat value for locally occurring flora and fauna.

The Project is located around 200 metres north of a coastal wetland and littoral rainforest proximity area. The mitigation measures provided in Chapter 1 of this EIS, in particular those relating to water quality would minimise adverse impacts on ecological values.

Based on the findings of the site surveys, a BDAR Waiver was prepared and was approved by the DPE (see Appendix J). It was determined that the Project is not likely to have a significant impact on biodiversity values.

20.2.4Improved valuation, pricing and incentive mechanisms

This principle requires that costs to the environment are incorporated or internalised in terms of the overall project costs, ensuring that decision making considers the environmental impacts. As a result, this EIS has, where possible, avoided or minimised environmental impacts and identified mitigation measures for areas where adverse environmental impacts may occur as part of this Project.

These requirements would result in an economic cost to the proponent, indicating that environmental resources have been given appropriate valuation in the development of the Project. The Project has been designed with an objective of minimising potential impacts on the surrounding environment. This indicates that the project has been developed with consideration of environmental outcomes.

Burning of fossil fuels like coal and oil has increased the concentration of atmospheric carbon dioxide which is known to contribute to climate change. Climate change impacts could potentially impose a significant financial burden on governments and taxpayers through rising health care costs, destruction of property, increased food prices, and more. The social cost of carbon is a measure of the economic harm from those impacts, expressed as the dollar value of the total damages from emitting one tonne of carbon dioxide into the atmosphere.

The construction of the Project will facilitate the increased uptake of renewable energy projects, which it is expected will ultimately replace fossil fuels in energy generation. Economic benefits will be achieved through minimising emissions of carbon dioxide into the atmosphere.

20.3 Conclusion

Each ecologically sustainable development principle has been considered and incorporated in the development of Project. With appropriate mitigation measures as identified throughout this EIS undertaking the Project in the manner proposed is consistent with the principles of ESD.

21 Justification and Conclusion

21.1 Project justification

21.1.1 Project objectives

The objectives of the Project are to:

- Increase firming infrastructure and the potential for additional renewable energy assets to be built in NSW
- Improve the security, resilience and sustainability of NSW's electricity grid
- Help reduce the direct carbon emission of the NSW's electricity grid (by not relying on traditional fossil fuel firming assets)
- Minimise adverse impacts on the environment and community during construction and operation.

21.1.2 Need for the Project

Over the last 10-15 years, there has been a steady increase in the number of renewable projects which have come online and are generating electricity for use in the NEM, while more of the older traditional coal fired power stations have been retired and decommissioned. This transition from thermal generation to renewable generation is expected to continue into the future. To support this transition, energy storage will be required to support the intermittent nature of generating electricity from renewable energy sources and to provide a reliable and secure source of electricity to consumers and the local population.

The Federal, State and Local Governments have put in place a number of plans, strategies and roadmaps, to progress and optimise consumer benefits through a transition of the energy market. These include:

- *2020 Integrated System Plan for the National Electricity Market* (2020 ISP) (Australian Energy Market Operator (AEMO), 2020)
- The Transmission Infrastructure Strategy (DPIE, 2018)
- The Electricity Strategy (DPIE,2019)
- Electricity Infrastructure Roadmap (DPIE, 2020)
- *NSW Climate Change Policy Framework* (NSW Office of Environment and Heritage (OEH), 2016)

Wind and solar generation are variable in their output and need to be complemented with firm and flexible technologies such as hydro, batteries, bioenergy, concentrated solar power, demand management and gas-fired generators. When variable generators are unable to satisfy demand, other technologies which can provide electricity on demand, dispatchable firm generation (i.e. gas and battery storage) is able to meet electricity demand, provided there is sufficient firm generation capacity.

Without the development and operation of short and long-term dispatch infrastructure to support increasing investment in renewable energy, there is the potential for a future deficit in capacity and consequently the reliability of the NSW power supply system is exposed. In a worst-case scenario, this can lead to load shedding or blackout events.

The Project involves the development of a large-scale BESS. BESS facilities, such as that proposed by the Project, would provide enabling infrastructure to protect the ongoing reliability of electricity supply during the expansion of the renewable energy industry in NSW.

21.1.3Site suitability

The Project is located within an existing industrial area within the Smithfield Recycling and Manufacturing Precinct. The Project Site has been selected in order to locate the BESS with existing energy dispatch infrastructure (i.e. the SEF peaking plant).

The Project Site is suitable for the proposed development as is consistent with other existing uses at the site, appropriately zoned for energy infrastructure and on land that is leased by the Proponent. The location of the BESS facility is proposed in an area which is expected to be vacant following the removal of redundant SEF infrastructure (DA94/165-MOD3).

Alternative sites within and near the SEF were also considered through the site selection exercise. The key limiting factors to an alternative site were identified as being potential increased costs and environmental impacts associated with the acquisition of a suitable property and the increased extent of connecting infrastructure between the BESS and Guildford substation.

The Project Site has been refined since the submission of the Scoping Report as a result of design development, consultation with key stakeholders and to reduce the environmental impact.

21.2 Conclusion

Smithfield BESS Pty Ltd as owned by Iberdrola Australia Limited (Iberdrola) (the Proponent) is seeking development consent for the construction, operation and maintenance of a large-scale Battery Energy Storage System (BESS) at the Smithfield Energy Facility (SEF) (Lot 33, DP850596) at 6 Herbert Place, Smithfield NSW 2164 (the Project Site). The BESS would have a capacity of up to 72 Megawatts (MW) and up to 260 Megawatt-hours (MWh) of battery storage capacity (the Project).

The Project would involve construction and operation of the following:

- A BESS including battery enclosures, inverters, transformers, switch room and control room
- Medium voltage cables between the transformers and the existing switchgear building in the northeast corner of the SEF
- Switchgear building upgrades to facilitate connection of the BESS
- Site access to the BESS from Herbert Place
- Utilities to support operation of the BESS
- Stormwater management infrastructure, lighting, fencing and security.

Construction is expected to commence in mid to late 2024 and will continue for approximately 12 months. Environmental investigations were undertaken during the preparation of the EIS to assess the potential environmental impacts of the Project.

The EIS concludes that many of the potential impacts identified would be effectively managed through Project design. To manage other impacts, and in some cases eliminate them completely, a number of mitigation and management measures would be implemented as outlined in Chapter 19.

The EIS includes an assessment of the permissibility of the Proposal under relevant EPIs and legislation (Chapter 5). The Project is permissible with consent and is State Significant Development (SSD) under Part 4, Division 4.7 of the EP&A Act.

In conclusion the Project has been assessed in accordance with the EP&A Act and the SEARs. The Project satisfies the requirements of the SEARs (Appendix A) and is consistent with the principles of ecologically sustainable development (Chapter 20). The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. The assessment concluded that no significant environmental impacts have been identified as a result of the Project. It is considered that any potential impacts can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Project has been assessed against, and has been found to be consistent with, the priorities and targets adopted in relevant published and draft State plans, as well as Government policies and strategies.

The Project is considered critical in supporting the NSW Government's electricity strategy for a reliable, affordable and sustainable electricity future that supports a growing economy. Overall, the EIS concludes that the Project is in the public interest and approval is recommended.

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APPENDIX A CONSOLIDATED SEARS COMPLIANCE

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
General	
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the *Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)* and must have regard to the State Significant Development Guidelines.	Throughout the EIS Statement of Validity Appendix B
In particular, the EIS must include:	See below
• A stand-alone executive summary;	Executive Summary
• A full description of the development, including:	See below
– Details of construction, operation and decommissioning;	Chapter 4
– A high quality site plan at an adequate scale showing all infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process);	Figure 4-1 Figure 4-6
– A high quality detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development;	Figure 19-1
• A strategic justification of the development focusing on site selection and the suitability of the proposed site with respect to potential land use conflicts with existing and future surrounding land uses (including existing land use, rural/residential development, Crown lands adjacent to the site and neighbouring developments);	Chapter 21 Chapter 3
• An assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including:	N/A
– A description of the existing environment likely to be affected by the development using sufficient baseline data;	Chapters 8-18 Appendix C - Appendix I
– An assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing or proposed developments in the region, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice including *the Cumulative Impact Assessment Guideline (DPIE, 2021);*	Chapters 8 - 18 Appendix C - Appendix I
– A description of the measures that would be implemented to avoid, mitigate and/or offset the impacts of the development (including draft management plans for specific issues as identified below); and	Chapters 8-18 Chapter 19
– A description of the measures that would be implemented to monitor and report on the environmental performance of the development;	Chapters 8-18 Chapter 19
• A consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS;	Chapter 19
• A detailed evaluation of the merits of the project as a whole having regard to:	See below

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
– The requirements in Section 4.15 of the *Environmental Planning and Assessment Act 1979,* including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development;	Chapter 20 Appendix B
– The suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses; and	Section 21.1.3
– Feasible alternatives to the development (and its key components), including the consequences of not carrying out the development;	Section 3.4
• A detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter.	Section 3.2
Capital Investment Value and Employment • Provide a detailed calculation of the capital investment value (CIV) of the development, prepared by an AIQS Certified Quantity Surveyor or RICS Chartered Quantity Surveyor in accordance with Planning Circular PS 21-020: Calculation of Capital Investment Value. The calculation of the estimated CIV is to be accurate at the date of application and include details of all components and assumptions from which it is derived; and	Separate report and will be provided to DPE as part of the EIS Lodgement
• Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the development, including details of the methodology to determine the figures provided.	Chapter 13
The development application must be accompanied by:	See below
• The consent of the owner/s of the land (as required in Section 23(1) of the Regulation); and	Provided to DPE prior to determination
• A declaration from a Registered Environmental Assessment Practitioner that the EIS includes the information specified in the Department's Registered Environmental Assessment Practitioner Guidelines.	Statement of Validity
Key Issues	
The EIS must address the following specific matters:	See below
Biodiversity	
• An assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW), the Biodiversity Assessment Method 2020 (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), unless a BDAR Waiver is issued for the development;	Chapter 17 Appendix J
• The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; and	Not applicable
• If an offset is required, details of the measures proposed to address the offset obligations.	Not applicable

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
Land	
• A detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints;	Chapter 3 Chapter 5 Chapters 8-18
• An assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including:	See below
– Flood prone land, acid sulphate soils and Crown lands; and	Chapter 11-12
– A cumulative impact assessment of nearby developments;	Chapter 18
• An assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including consideration of the zoning provisions applying to the land, including subdivision;	Chapter 5 Chapter 11
Visual	
• A detailed assessment of the likely visual impacts (including night lighting) of all components of the project on surrounding residences and key locations and provide details of measures to mitigate and/or manage potential impacts;	Chapter 15
Noise	
• An assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area), and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria.	Chapter 9 Appendix D
Transport	
• An assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation;	Chapter 8 Appendix C
• An assessment of the likely transport impacts to the site access route and site access point(s) particularly in relation to the capacity and condition of the roads, road safety and intersection performance;	Chapter 8 Appendix C
• A cumulative impact assessment of traffic from nearby developments; and	Chapter 8 Appendix C Chapter 18
• Details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority.	Chapter 8 Appendix C Appendix C
Water	

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
• An assessment of the likely impacts of the development (including flooding) on surface water and groundwater resources and measures proposed to monitor, reduce and mitigate these impacts;	Chapter 12 Appendix G
• Details of water requirements and supply arrangements for construction and operation; and	Chapter 12 Appendix G
• A description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with *Managing Urban Stormwater: Soils & Construction (Landcom 2004*).	Chapter 12 Appendix G
Hazards	
• A preliminary risk screening completed in accordance with *State Environmental Planning Policy (Resilience and Hazards)*;	Chapter 10 Appendix E
• A Preliminary Hazard Analysis (PHA) must be prepared in accordance with the Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment (DoP, 2011). The PHA must consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning (DoP, 2011);	Chapter 10 Appendix E
• Consultation with the pipeline operator for any nearby high-pressure pipelines and report on the hazard analysis and consultation outcomes;	Section 6.5
• An assessment of potential hazards and risks including but not limited to bushfires, spontaneous ignition, electromagnetic fields or the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields;	Chapter 10 Appendix E
Social impact	
• An assessment of the social impacts in accordance with Social Impact Assessment Guideline (DPIE, 2021)	Chapter 13 Appendix H
Economic	
• An assessment of the economic benefits and/or impacts of the project to the region and the State as a whole; and	Chapter 13 Appendix I
Waste	
• Identify, quantify and classify the likely waste stream to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.	Chapter 14
Plans and documents	
• The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Part 3 of the Regulation. Provide these as part of the EIS rather than as separate documents.	Various Figures throughout the EIS

Secretary's Environmental Assessment Requirements	Where addressed in the EIS
• In addition, the EIS must include high quality files of maps and figures of the subject site and proposal	Various Figures throughout the EIS
Legislation, Policies & Guidelines	
• The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified.	Chapter 5
• A list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at:	Chapter 5
https://www.planning.nsw.gov.au/Policy-and-Legislation/Planning-reform s/Rapid-Assessment-Framework/Improving-assessment-guidance	Chapter 5
https://www.planningportal.nsw.gov.au/major-projects/assessment/polici es-and-guidelines; and	Chapter 5
http://www.environment.gov.au/epbc/publications#assessments	Chapter 5
Consultation	
• During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups, affected landowners and any exploration licence and/or mineral title holders.	Chapter 6
• In particular you must undertake detailed consultation with affected landowners surrounding the development, Cumberland City Council and relevant government agencies.	Chapter 6
The EIS must: • Detail how engagement undertaken was consistent with the Undertaking *Engagement Guide: Guidance for State Significant Projects* (DPIE, 2021); and	Chapter 6
• Describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, an explanation should be provided.	Chapter 6
Expiry Date	
• If you do not lodge a Development Application and EIS for the development within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date.	Noted

APPENDIX B EP&A REGULATION CHECKLIST

Requirement	Where addressed in EIS
Part 8 Division 5 cl 190. Form of the environmental impact statement	
(1) An environmental impact statement must contain the following information: (a) the name, address and professional qualifications of the person who prepared the statement	Statement of Validity
(b) the name and address of the responsible person	Statement of Validity
(c) the address of the land: (i) to which the development application relates, or (ii) on which the activity or infrastructure to which the statement relates will be carried out,	Statement of Validity
(d) a description of the development, activity or infrastructure	Statement of Validity
(e) an assessment by the person who prepared the statement of the environmental impact of the development, activity or infrastructure, dealing with the matters referred to in this Division	Statement of Validity
(2) The person preparing the statement must have regard to: (a) for State significant development – the *State Significant Development Guidelines*, or (b) for State significant infrastructure – the *State Significant Infrastructure Guidelines*.	Statement of Validity
(3) An environmental impact statement must also contain a declaration by a relevant person that: (a) the statement has been prepared in accordance with this Regulation, and (b) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure, and (c) the information contained in the statement is not false or misleading, and (d) for State significant development or State significant infrastructure—the statement contains the information required under the *Registered Environmental Assessment Practitioner Guidelines*.	Statement of Validity
(4) In this section— ***registered environmental assessment practitioner*** means a person who is registered or certified under a professional scheme that is specified as a registered environmental assessment practitioner scheme in the *Accredited Registered Environmental Assessment Practitioner (REAP) Schemes* published on the NSW Planning Portal on 1 July 2021. ***Registered Environmental Assessment Practitioner Guidelines*** means the Registered Environmental Assessment Practitioner Guidelines prepared by the Planning Secretary as in force from time to time and published on the Department's website. ***relevant person*** means: (a) for State significant development or State significant infrastructure—a registered environmental assessment practitioner, or	Statement of Validity

Requirement	Where addressed in EIS
(b) otherwise—the person who prepares the environmental impact statement.	
Part 8 Division 5 cl 191 Compliance with environmental assessment requirements	
The environmental impact statement must comply with the environmental assessment requirements notified under section 176 or the Act, section 5.16(4).	Statement of Validity
Part 8 Division 5 cl 192 Content of the environmental impact statement	
(1) An environmental impact statement must contain the following:	
(a) a summary of the environmental impact statement,	Executive Summary
(b) a statement of the objectives of the development, activity or infrastructure,	Section 1.1
(c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives, including the consequences of not carrying out the development, activity or infrastructure,	Section 3.4
(d) an analysis of the development, activity or infrastructure, including (i) a full description of the development, activity or infrastructure, and	Chapter 4
(ii) a general description of the environment likely to be affected by the development, activity or infrastructure and a detailed description of the aspects of the environment that are likely to be significantly affected, and	Executive Summary Chapters 8-18
(iii) the likely impact on the environment of the development, activity or infrastructure, and	Executive Summary Sections 8-19 Appendix C-Appendix I
(iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and	Sections 8-19 Appendix C-Appendix I
(v) a list of the approvals that must be obtained under another Act or law before the development, activity or infrastructure may lawfully be carried out,	Chapter 5
(e) a compilation, in a single section of the environmental impact statement, of the measures referred to in paragraph (d)(iv),	Section 19
(f) the reasons justifying the carrying out of the development, activity or infrastructure, considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in section 193.	Chapters 3, 20-21

APPENDIX C TRAFFIC IMPACT ASSESSMENT

APPENDIX D NOISE AND VIBRATION ASSESSMENT

APPENDIX E PRELIMINARY HAZARD ANALYSIS

APPENDIX F PRELIMINARY SITE INVESTIGATION

APPENDIX G WATER IMPACT ASSESSMENT

APPENDIX H SOCIAL IMPACT ASSESSMENT

APPENDIX I ECONOMIC IMPACT ASSESSMENT

APPENDIX J BDAR WAIVER APPROVAL