Port of Newcastle

September 2023

Confidential

Scoping Report

Clean Energy Precinct Concept Plan

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Scoping Report
Clean Energy Precinct Concept Plan

Port of Newcastle

WSP
Level 3, 51-55 Bolton St
Newcastle NSW 2300
PO Box 1162
Newcastle NSW 2300

Tel: +61 2 4929 8300
Fax: +61 2 4929 8382
wsp.com

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	Name	Date	Signature
Prepared by:	Lizzie Whiting; Annie Pinnock	07/09/2023	
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Approved by:	Mark Maund	07/09/2023	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Abbreviations

ABS	Australian Bureau of Statistics
AEMO	Australian Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
ASC	Australian Soil Classification
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity development assessment report
BIA	Biologically important area
Biodiversity and Conservation SEPP	State Environmental Planning Policy (Biodiversity and Conservation SEPP) 2021
Biosecurity Act	*Biosecurity Act 2015*
BOM	Bureau of Meteorology
BOS	Basic oxygen slag
BSAL	Biophysical Strategic Agricultural Land
CBD	Central business district
CLM Act	*Contaminated Land Management Act 1997*
CO_2	Carbon dioxide
COP	Convention on Climate Change Conference of Parties
COP26	26th annual Convention on Climate Change Conference of Parties
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCCEEW	Department of Climate Change, Environment, Energy and Water (Cth)
DISER	Department of Industry, Science, Energy and Resources
DPE	Department of Planning and Environment (formerly DPIE)
DPIE	Department of Planning, Industry and Environment (now DPE)
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
EnergyCo	Energy Corporation of NSW
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*

ESD	Ecologically sustainable development
ESOO	Electricity Statement of Opportunities
EU	European Union
EV	Electric vehicle
FM Act	*Fisheries Management Act 1994*
GDE	Groundwater dependent ecosystem
GGBF	Green and Golden Bell Frog
GHG	Greenhouse gas
GW	Gigawatts
GWh	Gigawatt hours
IPC	Independent Planning Commission
ISP	Integrated System Plan
KFH	Key Fish Habitat
KIWEF	Kooragang Island Waste Emplacement Facility
kg	Kilograms
km	Kilometres
ktpa	Kilotonnes per annum
kV	Kilovolt
LUSS	Land Use Safety Study
LCGs	Large-scale Generation Certificates
LEP	Local Environmental Plan
LGA	Local government area
LRET	Large-scale Renewable Energy Target
MHF	Major hazard facility
MCA	Multi-criteria analysis
MNES	Matters of National Environmental Significance
MW	Megawatts
NCIG	National Coal Infrastructure Group
NEM	National Electricity Market
NML	Noise management level
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*

NSW	New South Wales
ODP	Optimal development path
OEH	Office of Environment and Heritage (now Heritage NSW)
PCT	Plant Community Type
PEM	Proton Exchange Membrane
PHA	Preliminary hazard analysis
PM	Particulate matter
PMST	Protected Matter Search Tool
POEO Act	*Protection of the Environment Operations Act 1997*
PON	Port of Newcastle
PV	Photovoltaic
REAP	Registered Environmental Assessment Practitioner
Resilience and Hazards SEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
RET	Renewable Energy Target
REZ	Renewable Energy Zone
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SIA	Social impact assessment
SSD	State Significant Development
SSI	State Significant Infrastructure
STEM	Science, Technology, Engineering and Mathematics
SALs	Suburbs and localities
TECs	Threatened ecological communities
TfNSW	Transport for NSW
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
UCLs	Urban centres and localities
VRE	Variable renewable energy
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WHS	Work Health and Safety

Glossary

Applicant	The applicant for this State Significant Development (SSD) project is Port of Newcastle.
Construction footprint	Area that would be impacted during construction including temporary development that would be removed once operational. The construction footprint is similar size to the development footprint at 107 hectares.
Concept Plan	Plan that sets out concept proposals for development of the site, subject to future development applications.
Development application	A development application seeking consent for SSD under division 4.7 of the EP&A Act.
Development footprint	The development footprint is comprised areas of both the permanent and temporary footprint that represent the total area physically disturbed by development of the project.
Disturbance area	Disturbance of up to 107 hectares. The disturbance footprint is similar size to the development footprint.
Operational footprint	Area with permanent development to be used during operation including buildings, hard stand and roads.
Permanent footprint	The permanent footprint comprises the land that would be permanently altered for the operation of the project.
Project	The proposed Clean Energy Precinct and associated infrastructure that would allow energy generation and storage and connection into the National Electricity Market (NEM).
Project site	The project site including all land within the proposed Concept Plan boundary.
Project study area	Includes the project site and a 10 kilometre (km) buffer around the site for database searches to inform the environmental assessment.
Proponent	Port of Newcastle (PON)
REZ	Renewable Energy Zone – area of high energy resource potential where strategic transmission infrastructure upgrades can connect multiple projects at lower cost.
Strategy	Diversity and Inclusion Strategy prepared by PON.
Temporary footprint	The temporary footprint comprises the land that would be temporarily disturbed during construction. These areas would then be rehabilitated following construction.

Executive summary

Port of Newcastle (PON) propose to construct and operate the Clean Energy Precinct (the project), a facility for clean energy in Newcastle, New South Wales (NSW). The project, a clean energy development, would provide renewable energy that would contribute to the NSW and Commonwealth renewable energy targets and help achieve affordable, clean and reliable energy.

Project site

The proposed site for the Clean Energy Precinct is located at the former Kooragang Island Waste Emplacement Facility (KIWEF) site on Kooragang Island within the City of Newcastle local government area and Awabakal Local Aboriginal Land Council. Existing land uses of the project site and surrounds are predominantly industrial, shipping and port operations, with environmental conservation land comprising of wetlands, including Ramsar wetlands, to the north of the port.

The project site is approximately 170 kilometres (km) by road north of Sydney and approximately 760 km south of Brisbane.

Project description

The project involves Concept Plan to be delivered in nominally three stages for the proposed Clean Energy Precinct in Newcastle, NSW. Fully constructed, the project would help facilitate clean energy production, storage, transmission, domestic distribution and international export.

The project is uniquely placed to produce the clean energy required to help satisfy emerging domestic and export markets by leveraging existing capacity across the electricity, water and port infrastructure. PON envisage the Clean Energy Precinct would activate new investment in renewable electricity zones across NSW and the newly announced offshore wind zones off the coast of the port. Many of Australia's largest users of energy and gas are located proximate to the project site and clean energy offtake cases have been identified by PON including mobility (trucks, buses, cars, trains, aeroplanes and boats), agriculture, power generation, gas blending, export and bunkering.

A separate development application has been submitted for the establishment of infrastructure and ammonia storage within the Clean Energy Precinct to enable early infrastructure works for the site. This would prepare the site for the Concept Plan while further detailed environmental impact assessment, design works and community consultation and stakeholder engagement are undertaken on the Concept Plan proposed in this development application. This separate development application includes establishment of electrical infrastructure, water infrastructure and ancillary works, construction vehicle and workforce vehicle parking, construction laydown and stockpiles and construction of an ammonia storage facility.

PON has advised that the Clean Energy Precinct (when fully developed) would provide an estimated 5,800 jobs (5,261 construction jobs and 539 ongoing jobs) and produce $4.2 billion in gross regional production.

It is expected that the project would be operational in late 2026 or early 2027.

Statutory planning

Environmental planning approval for the project is required in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act), *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and other relevant statutory requirements. Approval for the project is sought under Part 4, Division 4.4 (Concept development applications) of the EP&A Act.

Other relevant statutory matters are addressed in the Scoping Report, including potential impact of the project on Matters of National Environmental Significance (MNES) under the EPBC Act.

Consultation

Engagement relating to this project has been an iterative process over the last two years that has sought to involve stakeholders and the community as PON diversifies to grow its export base and a clean energy future locally and internationally.

PON has identified an extensive list of relevant key stakeholders who are affected by or have an interest or influence on the project. PON is maintaining a comprehensive Stakeholder List that currently contains 604 engaged stakeholders. This would be a primary database that would grow as the project develops and would be used as a central database for communications across future stages.

Engagement to date has focused on the economic, social and environmental opportunity the project represents. Key areas of interest from industry and government include:

- potential for new industries in the Hunter region
- job creation and leveraging the current workforce into new industries and capabilities
- opportunities for existing industry to provide services locally and expand their capability into new technology
- the relationship between the Clean Energy Precinct and the roll-out of NSW Renewable Energy Zones (REZs)
- opportunities for research and development and to showcase Hunter businesses as leaders in this field
- business and investment opportunities.

PON engaged with internal and external stakeholders to develop a *Diversity and Inclusion Strategy* (the Strategy). The Strategy identified opportunities to further support and engage with local First Nations communities that has informed PON's Reconciliation Action Plan.

This project provides an opportunity for PON to put commitments in the *2023 Reconciliation Action Plan* into action. As part of this project, the team have engaged an Indigenous Advisor from the Institute for Regional Futures that would be available to advise on this project.

A comprehensive Communications and Stakeholder Engagement Strategy is currently being drafted that would outline the messages, activities and channels for future phases of the planning process including exhibition of the Environmental Impact Statement, construction and operation.

Preliminary environmental assessment

Biodiversity

The project study area contains Saline Wetlands vegetation formations from the Saltmarsh and Mangrove Swamps vegetation classes.

Desktop assessment identified seven Threatened Ecological Communities (TECs) listed under the EPBC Act with potential to occur within the project study area. Database searches identified 21 threatened flora species listed under the EPBC Act that are predicted or known to occur within 10 km of the project site. Desktop searches identified 50 threatened fauna species, and two conservation dependent fauna species, listed under the EPBC Act, that are predicted or known to occur within 10 km of the project site.

Of most concern is the Green and Golden Bell Frog, listed as vulnerable under the EPBC Act, that has a high likelihood of occurrence as records for this species occur in the project site and the site is part of key local habitat for this species.

One Ramsar wetland or Wetland of International Importance was identified by the Protected Matters Search Tool in the buffer zone of the project study area, which is the Hunter Estuary Wetlands. The project study area contains mapped Key Fish Habitat along the Hunter River and associated wetlands.

Heritage

Aboriginal heritage

The project site is within the Awabakal Local Aboriginal Land Council Area. Aboriginal occupation and use of the land occurred for many years prior to European settlers, and the area was used for hunting, fishing and gathering activities by the Awabakal and the Worimi people.

The Aboriginal Heritage Information Management Search (AHIMS) found 52 sites within the surrounding area, most of which are located south of the project site. The area comprises mainly surface artefacts (isolated finds or artefact scatters) that are generally distributed along water courses, or beside wetlands, with a few also associated with middens.

There are no AHIMS sites within the project site.

Non-Aboriginal heritage

The project site is known historically as Ash Island that was surrounded by a number of other islands before they were all joined to create Kooragang Island. Being estuary islands, Ash Island, along with the others, were a rich hunting area and food resources included shellfish and fish.

Heritage registers including the World Heritage List, National Heritage List, State Heritage Register and the Newcastle Local Environmental Plan 2012 were searched, and no non-Aboriginal heritage items were found to occur within the project site.

Landscape character and visual amenity

The Clean Energy Precinct would be developed within an existing port environment that contains port and industrial activities including existing rail lines, local roads and port related infrastructure. Construction of the project would alter the visual environment during various activities including earthworks, movement of plant and material and construction of buildings and infrastructure.

Buildings would be designed to consider the existing visual environment through both practicality as a heavy industrial activity and principles that consider the location near wetlands and Green and Golden Bell Frog habitat. Infrastructure, including electrical, water and roads, would be designed to appropriate standards with consideration of the role and function of the Clean Energy Precinct.

A detailed Landscape Character and Visual Impact Assessment would be prepared as part of the EIS to identify potential visibility of the project from different viewpoints along the corridor.

Hazard and risk

There is currently no ammonia or hydrogen storage or production at the project site. For the project, potentially hazardous materials that have been identified includes ammonia and hydrogen. The proposed facility exceeds the screening threshold for storage of ammonia and hydrogen and is therefore classed as potentially hazardous. A Preliminary Hazard Analysis would be prepared as part of the EIS to further consider the risks and identify measures to reduce potential impact of the development. The project would also be considered a major hazard facility under the Work Health and Safety Regulation 2017.

Noise and vibration

The project site is adjoined by multiple heavy industrial land uses and large areas of unused land that acts as a buffer zone to any nearby noise sensitive receivers. The site is generally surrounded by a highly urban and industrialised environment, influenced primarily by noise from road and rail traffic, and industrial sources, in addition to operations within the existing port and harbour areas. Ground vibration associated with road traffic is generally low, and large separation distances between the project site and residential receivers mean that risk of existing vibration impacts at sensitive receivers is considered low.

A detailed construction and operational noise and vibration assessment would be included in the EIS. Background noise level monitoring would also be conducted as part of the EIS.

Traffic and access

The road network within the project study area includes several roads used for operations of PON including Cormorant Road, Southbank Road and Delta Road. Two main intersections in the area surrounding the project site are the Industrial Drive/George Street intersection and the Industrial Drive/Ingall Street intersection. Main road access to the proposal site is from Tourle Street, Delta Road and Minyan Way, all via Industrial Drive.

Rail infrastructure is available to service the project site. The project site is also accessible to cargo ships via the shipping channel in the South Arm of the Hunter River.

There may be some temporary disruptions to traffic movements along roads during the construction stages. Construction may require temporary traffic management or lane closures for safety; however, this would be scheduled to minimise impacts during peak traffic periods.

The assessment in the EIS would consider requirements for maintaining access to properties, roads and active and passive recreation areas near the project site. Site access management strategies to minimise conflict and improve safety would be developed, along with management and mitigation measures to reduce impact of traffic during construction and operation.

Soils, topography and contamination

Hunter and Central Coast Development Corporation (HCCDC) are in the final stages of closing the KIWEF site landfill in accordance with the Surrender Notice and handing control over to PON. The closure works carried out by HCCDC comprise of an interim capping layer that may need to be upgraded to accommodate development of the works.

Significantly contaminated materials encountered during remediation works were processed according to a materials management plan. It is understood that a thinner capping layer may be present across much of the remainder of the site (outside of the capped audited areas) where there exists potential for significantly contaminated materials to be encountered during shallow excavations.

Based on the review of available information, the key contaminants of concern at the site are understood to be generally associated with wastes placed as fill materials.

Contamination across the site has generally been identified as being a low to moderate risk to human health or environment; however, a number of areas were identified as containing significantly contaminated material that may pose a higher level of risk to human health or the environment.

It is understood that HCCDC are currently working with the NSW Environment Protection Authority (EPA) on developing a plan of management for the site. This plan of management would address the ongoing management and monitoring for the existing (undeveloped) site. PON would develop its own plan of management in consultation with the NSW Treasury (the Landowner) and the EPA to take into account development of the infrastructure associated with the project. PON's plan of management would be developed in accordance with the requirements of the Remediation Deed, the Surrender Notice and any future environmental licencing requirements.

Air quality and greenhouse gas

Primary industrial sources of air emissions within and surrounding the project site include the OneSteel and Smorgen facility at Mayfield, Orica and Incitec plants on Kooragang Island and the Tomago Aluminium smelter to the north, emissions from coal and grain and three fuel storage facilities in Newcastle, as well as Stolthaven bulk liquids Mayfield No. 7 berth. The Lower Hunter map for air quality at the Mayfield station on 10 March 2023 showed PM_{10} was fair, and all other levels listed for air quality were good.

During construction, local air quality within the project study area may be temporarily affected by particulate (dust) and greenhouse gas emissions. Air quality impacts from construction are expected to be short-term and minor due to the existing industrial operations in the area. During operation, the project is not anticipated to significantly impact local air quality or GHG.

Waste and resource use

Potential waste streams for current activities at the port include putrescible and non-putrescible solid waste and municipal waste. Waste management and waste transfer facilities within and near the project site include the Summerhill Waste Management Centre and Solo Resource Recovery Centre.

Construction of the project would result in a range of typical waste materials including but not limited to vegetation waste, spoil from excavations, surplus construction materials, and general domestic waste. During operation, the main source of waste material is expected to be from putrescible and non-putrescible general solid waste from operation and maintenance personnel.

While the project would result in some increased demand on local and regional resources, it would be unlikely that the project alone would result in any resource becoming scarce or in short supply.

Cumulative impacts

Cumulative impact assessments focus on various environmental issues from within the project and their combined effect, the project's interaction with other projects (and proposed projects) and where construction and/or operational timeframes are likely to be concurrent.

Future environmental assessment for issues such as biodiversity, hazards and risk, noise and vibration, visual, and traffic for the project would involve identifying a baseline condition, including impacts of other potential projects, and determining cumulative impacts of the project.

EPBC Act

The project would impact on known habitat for Green and Golden Bell Frog. A referral to the Commonwealth Minister for the Environment would occur to determine if the project is a controlled action.

1 Introduction

This chapter gives an overview and background to the Clean Energy Precinct Concept Plan (the project). This chapter provides a summary of the project details, the concept plan, and the purpose and structure of this Scoping Report.

1.1 Clean Energy Precinct

Port of Newcastle (PON) (the proponent) propose to construct and operate the new Clean Energy Precinct (the project), a facility for clean energy in Newcastle, New South Wales (NSW) (see Figure 1.1 for the regional context of the project). Fully constructed, the project would facilitate clean energy production, storage, transmission, domestic distribution and international export using common user shared infrastructure.

The proponent is seeking approval for the project under Part 4, Division 4.4 (Concept development applications) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

A separate development application has been submitted for the establishment of infrastructure and ammonia storage within the Clean Energy Precinct to enable early infrastructure works for the site. This would prepare the site for the Concept Plan while further detailed environmental impact assessment, design works and community consultation and stakeholder engagement are undertaken on the Concept Plan to be delivered in three stages proposed in this development application. This separate development application includes establishment infrastructure including electrical infrastructure, water infrastructure and ancillary works, construction vehicle and workforce vehicle parking, construction laydown and stockpiles and construction of an ammonia storage facility.

The National Electricity Market (NEM) is transitioning towards renewable energy production, as evidenced by the proposed Hunter-Central Coast Renewable Energy Zone (REZ) been identified as one of NSW's priority energy zones. To assist this transition the project would enable production, storage and transmission of clean energy at the precinct. This would assist the NSW and Commonwealth achieve their zero emission targets, as discussed in Section 2.1.

1.2 Purpose of this report

This Scoping Report has been prepared on behalf of PON. The purpose of this report is to describe the project and present the preliminary environmental assessment of potential environmental issues that would be covered as part of an Environmental Impact Statement (EIS) for the project.

This report is intended to provide sufficient information to allow preparation of Secretary's Environmental Assessment Requirements (SEARs) to guide preparation of an EIS for the project in accordance with Part 4, Division 4.4 of the EP&A Act and the requirements of Part 8 Division 5 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), that apply to applications seeking Concept Plan approval.

The information and recommendations in this Scoping Report would be used to further inform the options investigations and ongoing design process for the project with an aim to avoid or minimise environmental, economic and social impacts wherever practicable.

1.3 The proponent

PON is a Newcastle-based company that provides trade and port development. PON currently handles around 4,697 ship movements and 166 million tonnes of cargo annually (PON, 2022). PON's vision is to diversify its trade and strive to create a safe, sustainable and environmentally and socially responsible future.

Table 1.1 Proponent details

Proponent details	
Name	Port of Newcastle Operations Pty Limited as Trustee for The Port of Newcastle Unit Trust
Address	Level 4, 251 Wharf Road Newcastle NSW 2300
ABN	97 539 122 070

1.4 Report terminology

The following terms are used throughout this Scoping Report:

- Clean Energy: Energy produced from renewable, zero emission sources which when used, releases low or zero emissions greenhouse gases (GHG) to the atmosphere.
- Clean Energy Precinct: Proposed precinct for clean energy infrastructure and projects.
- Concept Plan: Plan showing potential development of the precinct allowing for flexibility subject to stakeholder engagement, emerging technologies and clean energy developer interest over time.
- Green hydrogen: Hydrogen produced by splitting water into hydrogen and oxygen using renewable electricity through a process such as electrolysis, that results in low or zero carbon emissions.
- Green ammonia: Ammonia that is renewable and carbon-free. Various technologies are available, one way it is produced is by using hydrogen from water electrolysis and nitrogen separated from the air, both hydrogen and nitrogen are reacted together at high temperatures and pressures to produce ammonia.
- Renewable Energy Zone (REZ): Areas of high energy resource potential where strategic transmission infrastructure upgrades can connect multiple projects at lower cost (Australian Energy Market Operator [AEMO], 2020).
- The project: the proposed Clean Energy Precinct.
- Disturbance footprint: Area of land that would be disturbed by the establishment of the Clean Energy Precinct. The estimated disturbance footprint is approximately 107 hectares plus the establishment of a 17 hectare green corridor.
- Construction footprint: Area of land that would be disturbed during construction of the Clean Energy Precinct. The construction footprint is similar size to the development footprint at 107 hectares.

1.5 Project overview

PON propose to construct and operate the Clean Energy Precinct (the project) in Newcastle, NSW, that enables production, storage, distribution and export of clean energy such as green hydrogen and green ammonia using common user shared infrastructure. The project is located approximately 170 km (by road) north of Sydney and approximately 760 km south of Brisbane. The project is located within the City of Newcastle Local Government Area (LGA) and Awabakal Local Aboriginal Land Council at the former Kooragang Island Waste Emplacement Facility (KIWEF) site on Kooragang Island (see Figure 1.1). Existing land uses of the project site and surrounds are predominately industrial, shipping and port operations, with environmental conservation land comprising of wetlands, including Ramsar wetlands, to the north of the port.

Fully constructed, the project would facilitate clean energy production, storage, transmission, domestic distribution and international export. A separate development application has been submitted for the establishment of electrical infrastructure, water infrastructure and ancillary works, construction vehicle and workforce vehicle parking, construction laydown and stockpiles and an ammonia storage facility within the Clean Energy Precinct.

The project would also facilitate potential development of clean energy facilities, infrastructure and associated works such as:

- green hydrogen production facilities comprising:
  - water treatment facility
  - electrolysers
  - hydrogen compression and drying equipment
  - hydrogen storage
- green ammonia production infrastructure including:
  - air separation
  - nitrogen gas compression
  - ammonia synthesis
  - loading and export systems.
- Research and Innovation Hub:
  - facility associated with heavy industry research and facilities to enable the investigation of regulations and standards for new, clean, energy technologies
  - prototyping and testing of clean energy technologies and associated equipment
  - training facilities to support workforce development and transition into the clean energy industry
  - space and office facilities to enable co-location of industry, research and development and trade associations to promote innovation in clean energy technologies and industry (e.g. Science, Technology, Engineering and Mathematics (STEM) in schools)
  - foster community outreach programs to raise awareness and knowledge of clean energy technologies and industry
- parking for operational staff
- permanent site offices and amenities during operation, including control rooms, stores, warehousing and maintenance facilities.

It is expected that construction of the Clean Energy Precinct would commence in early 2025 and take about two years to complete. It is anticipated that the project would be operational in late 2026 or early 2027.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 1-1
Regional Context of the Project

Legend

- Road
- Railway
- Watercourse
- Project Site
- National Park

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:40,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

1.6 Project objectives

The project supports the NSW Governments objectives to accelerate decarbonisation and clean energy opportunities by increasing renewable energy generation, storage and investment under the Electricity Infrastructure Roadmap (Department of Primary Industries and Environment [DPIE], 2020).

The project aims to:

- leverage the Hunter's existing infrastructure, and skilled workforce to activate a 228 hectare Clean Energy Precinct (107 hectares of disturbance footprint plus a 17 hectare green corridor) to enable the large-scale production, storage, transport and export of clean energy across multiple vectors, such as hydrogen and ammonia
- support the build out of REZs across the region and state by creating a large electrical load demand at the Port of Newcastle
- assist Australia to meet its emissions reduction targets of reducing gas emissions to 43 per cent below 2005 levels by 2030 (Department of Climate Change, Energy, the Environment and Water [DCCEEW], 2022a).

PON has advised that the project (once fully developed) would provide $4.2 billion in additional gross regional product and approximately 5,800 new jobs in the Hunter Region by 2040, while decreasing domestic carbon emissions by approximately 660 kilotons per annum and decreasing export carbon emissions by approximately 1 megaton per annum while underpinning 3 GW in renewable electricity generation.

The objectives of the project include:

- establish infrastructure to enable development of clean energy production, storage, distribution and export of clean energy vectors from the Clean Energy Precinct
- support the build out of REZs within regional and state context
- provide energy security and a decarbonisation pathway for key local industry
- utilise existing infrastructure providing an efficient and lowest cost path of the energy transition and development of the clean energy industry
- diversify trade of commodities at the PON
- support the Hunter's workforce transition to clean energy
- provide facilities for the storage, domestic distribution and local industry use of clean energy
- provide facilities and a pathway to scale to enable the export of clean energy to international markets
- help achieve economies of scale for low-cost, clean and reliable electricity
- minimise potential adverse impacts on the environment.

1.7 Related development

Within the Hunter region, there are a number of clean energy related development proposals at various stages that may interact with the PON's Clean Energy Precinct in the future. These include proposals from the following proponents:

- Origin and Orica
- AGL and Fortescue Future Industries (FFI)
- Energy Estate
- PON's Infrastructure and Ammonia Storage within the proposed Clean Energy Precinct.

There are also a number of renewable energy projects proposed to be developed within the Hunter-Central Coast REZ. These projects would be subject to separate assessment and approval; however, may interact with the Clean Energy Precinct through the common user, shared infrastructure, export facilities or outcomes of research and development. For example, the Liddell and Bayswater power stations provide a regionally significant opportunity in the transition to renewable energy. The Upper Hunter's power transmission lines allow ready access to the grid for energy projects (Department of Planning and Environment [DPE], 2023).

Other potential renewable energy projects within the Hunter-Central Coast REZ include (DPE, 2023):

- 24 solar energy projects
- 13 onshore and seven offshore wind energy projects
- 35 large-scale batteries
- Eight pumped hydro projects.

Infrastructure upgrades would occur to support the project that would interact with clean energy developments (subject to separate approval). These would be considered and approved by the relevant agency including EnergyCo, Transgrid, Ausgrid and Hunter Water.

1.8 Structure of this report

The structure and content of this report is as follows:

- Chapter 1 – Introduction: Outlines the background and need for the project and purpose of this report.
- Chapter 2 – Strategic context and alternatives: Provides an overview of the strategic and regulatory context and anticipated benefits of the project. An overview of the options assessment that led to the preferred option is also presented.
- Chapter 3 – Project description: Provides an outline of the key features of the project.
- Chapter 4 – Statutory context: Provides an overview of the relevant statutory approvals framework for the project, including applicable legislation and planning policies.
- Chapter 5 – Stakeholder and community engagement: Provides an overview of stakeholder engagement activities that have been undertaken to date with regards to the project. An overview of the proposed future engagement activities is also provided.
- Chapter 6 – Preliminary environmental assessment: Provides a preliminary description of the existing environment and an initial consideration of potential direct and indirect impacts that may result from this proposal.
- Chapter 7 – Preliminary scoping: Provides a preliminary environmental risk analysis for the project, taking into account current scope and the existing environment.
- Chapter 8 – Conclusion: Outlines justification for the project and conclusion of this report.
- Chapter 9 – References: Identifies the key reports and documents used to generate this report.
- Appendices to this report includes:
  - Appendix A – Preliminary Biodiversity Assessment (WSP, 2023)
  - Appendix B – Preliminary Desktop Cultural Heritage Assessment (Heritage Now, 2023)
  - Appendix C – Initial Social Impact Assessment Scoping Report (WSP, 2023).

1.9 Limitations

The information presented in this Scoping Report has been based on preliminary desktop studies (Appendices A to C) and preliminary desktop review and assessment of published data including relevant databases, reports and other available literature. More detailed investigations of potential environmental issues, including field inspections, would occur during preparation of the EIS for the project.

2 Strategic context and alternatives

This chapter considers the need for the project. This chapter presents the strategic options that were considered and the benefits of the project. The project is also presented in the context of key government strategies and policies.

2.1 Need for emissions reduction

Climate change, which is linked to an increased level of GHG emissions in the atmosphere, is having worldwide impacts on society, the economy and the environment. In the 2015 Paris Agreement and the 2021 Glasgow Climate Pact (Convention on Climate Change Conference of Parties (COP26)), the European Union (EU) and 198 countries committed to try and limit global warming to 1.5°C to minimise impacts of climate change (United Nations (UN), 2022). A global commitment to achieve net zero GHG emissions by 2050 was agreed through strong policies, measures and actions. In view of this commitment, the Australian Government has set interim emission reduction targets, including a commitment to reduce emissions by 43 per cent below 2005 levels by 2030 (DCCEEW, 2022a). Independently, every state and territory in Australia has set a goal or target to achieve net zero emissions by the second half of this century (Climate Change Authority, 2020). NSW is set to halve emissions by 2030 under updated projections and objectives released as part of the Net Zero: Stage 1 Implementation Update (Department of Planning, Industry and Science, 2021).

The Renewable Energy Target (RET) Scheme reflects current efforts to achieve this goal. The scheme was implemented in 2009 with an initial target of 44,000 gigawatt hours (GWh) of renewable energy generation by 2020. The RET has driven more than 50 per cent reduction in the cost of large-scale wind and solar projects over the last 10 years (Clean Energy Council, 2022).

Electricity generation is currently Australia's largest source of emissions, accounting for 33 per cent of Australia's total annual emissions in 2020 (Climate Change Authority, 2020). Fossil fuels contributed 71 per cent of total electricity generation in 2021, including coal, gas and oil. Renewables contributed 29 per cent of total electricity generation in 2021, including solar, wind and hydro (DCCEEW, 2022b). The project would contribute to meeting Australia's commitments through enabling the production, storage, domestic distribution and international export of clean energy and resultant annual reduction in greenhouse gas emissions. The project would also contribute to domestic decarbonisation, clean energy production at scale, and aim to drive down electricity costs for consumers. Specifically, the project would contribute to achieving NSW's objective to deliver a 50 per cent cut in emissions by 2030 compared to 2005 levels.

2.2 Existing transmission network

The NEM incorporates around 40,000 kilometres of transmission lines and cables across Queensland, NSW, Australian Capital Territory, Victoria, South Australian and Tasmania. The NEM connects the southern and eastern states and territories in Australia and delivers around 80 per cent of Australia's electricity consumption. To meet Australia's emission reduction targets, the NEM needs to significantly transition from traditional energy sources to lower emission alternatives including renewable energy (DCCEEW, 2022c).

The existing transmission network was established to transport electricity primarily from generators in fossil fuel rich areas to local centres. As the supply mix changes and evolves, transmission networks need to be reconfigured to connect regions with high-quality renewable energy resources to load centres. The project is located within the Hunter-Central Coast Renewable Energy Zone (REZ). The Hunter-Central Coast regions have unique features which make them ideal for locations for a REZ, and have excellent renewable energy resources, existing power stations, rehabilitated mining land, electricity network infrastructure, port and transport infrastructure and skilled workforce (EnergyCo, 2022). The project would support the broader objectives of the Hunter-Central Coast REZ through providing investor certainty and underpinning renewable developments (see Figure 2.1).

2.3 Shift towards renewable energy

The shift to renewables is accelerating and the energy sector is undergoing rapid transformation; over the past five years the share of wind and solar in the NSW electricity generation mix has tripled (DCCEEW, 2022a).

The 2022 *Integrated System Plan* (ISP) (AEMO, 2022) forecasts the need for over 125 GW of additional Variable Renewable Energy (VRE) by 2050, to meet demand as coal-fired generation withdraws. To replace coal-fired generation, the renewable share of total annual generation would rise from approximately 28 per cent in 2020–2021 to 83 per cent in 2030–2031, to 96 per cent by 2040, and 98 per cent by 2050 (AEMO, 2022).

Retirement of coal generation is expected to be most rapid in NSW, with Mount Piper expected to be the sole remaining coal-fired generator in NSW after the expected closure of the Eraring and Bayswater power stations by 2035. This has potential to put pressure on future supply of energy, particularly when considering that electricity consumption in NSW is forecast to increase over the next ten years (Transgrid, 2022).

The project represents an investment in new large scale clean energy. Fully completed the Clean Energy Precinct would provide up to approximately 1.5 GW of green hydrogen and ammonia production for use in domestic decarbonisation with further potential for export of green energy to international markets as well as research and innovation opportunities to advance emerging technologies.

2.3.1 Decarbonising the Hunter Region

Decarbonisation presents significant economic opportunities for NSW to develop and advance decarbonised technologies, services and skills. The economic opportunities for Australia include:

- leveraging its competitive advantages to fulfil increasing local and international demand for innovative technologies and services that enable decarbonisation and climate change resilience
- deploying new decarbonised products and services, including technologies to reduce or capture emissions, that can service the domestic economy and be exported
- attracting private and sovereign investment, for decarbonised and climate change resilient infrastructure, technology and businesses
- growing climate change resilient industries, communities and ecosystems that support the efficient transition of the NSW economy while adapting to a changing climate.

The Hunter Region has a mature and thriving industrial economy and contributes significantly to the gross regional product through a variety of heavy industries in combination with the PON. Decarbonisation is required to enable NSW to reach net zero, and to continue the Hunter's 16,000-strong workforce in the energy and resources sector.

In 2019–2020, the Hunter Region's CO_2 emissions were approximately 4.9 million tCO_2-e. Industry contributes significantly to these emissions through electricity and gas used to power the manufacturing and transport of minerals and resources that the region produces. The region has potential to become a clean energy powerhouse, leveraging existing energy markets, skills and capabilities.

Based on the indicative demand, there is potential for the Hunter Region to supply sufficient clean hydrogen to reduce carbon emissions and PON has advised:

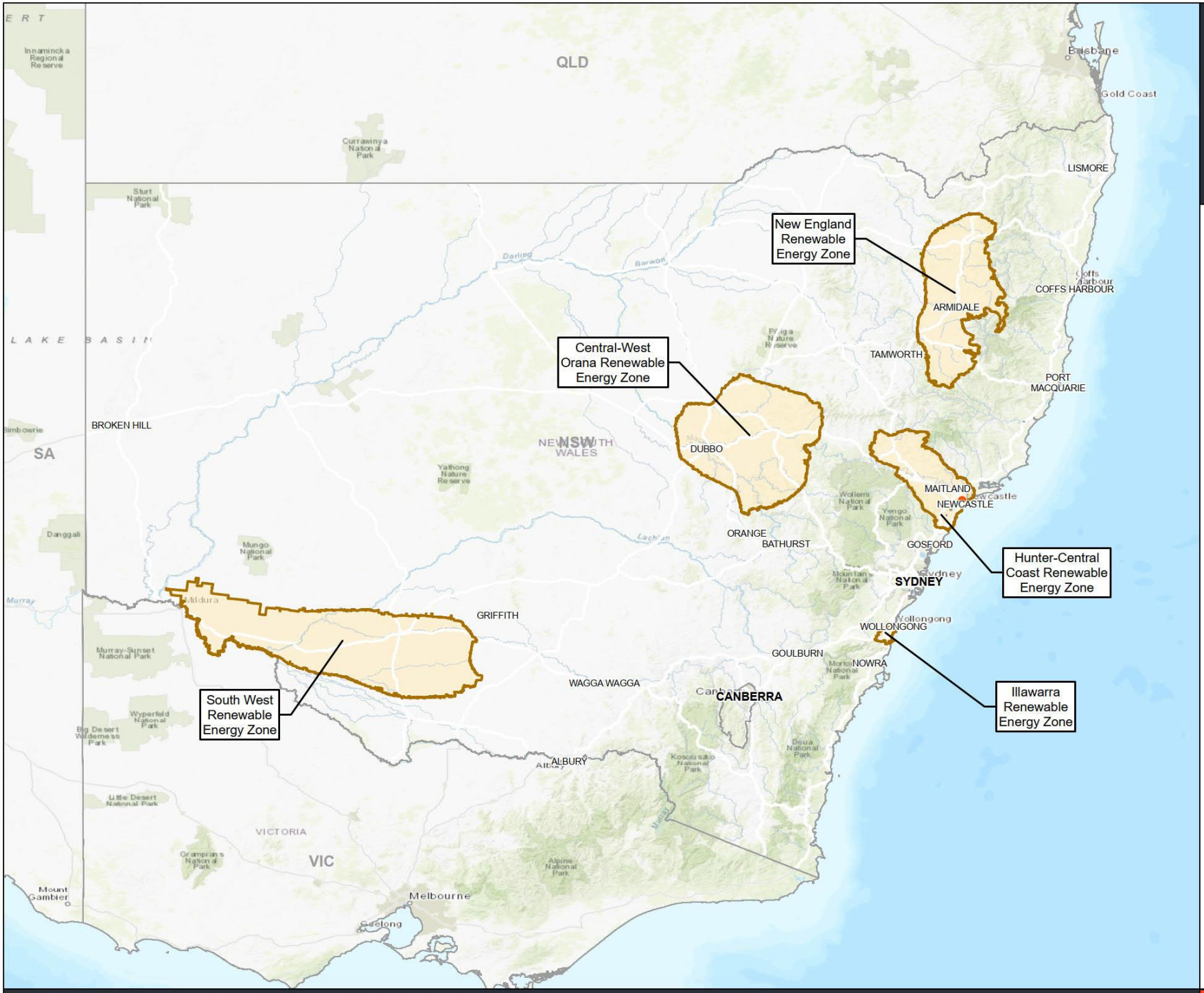
- in NSW, 660k tCO_2-e potential emissions could be avoided domestically each year through clean hydrogen production
- 4.1 million tCO_2-e potential emissions could be avoided each year as a result of clean product export.

2.4 Contribution to the National Electricity Market

The AEMO 2022 *Electricity Statement of Opportunities* (AEMO, 2023) provides updates of forecasts for demand and supply of electricity. The 2022 report noted the following:

- expanded production from large industrial customers in Victoria and South Australia contributes to a forecast growth in electricity consumption from 2022–23 in these regions, compared to the 2021 *Electricity Statement of Opportunities* (ESOO) and the Update to the 2021 ESOO
- electrification, particularly of businesses and take-up of electric vehicles (EVs) are the primary drivers of operational consumption being forecast to grow by approximately 15 per cent over the next 10 years
- operation of distributed photovoltaics (PV), battery storages, EVs and demand side response is projected to partially offset the growth in underlying consumption, potentially lessening the relative impact on forecast reliability
- with the projected sustained uptake of distributed PV, minimum demand forecasts continue to show a rapid decline
- pace, scale and location of electrification and other emerging opportunities, such as hydrogen production, remain an uncertain influence on the growth of NEM electricity consumption, particularly as the economy evolves to target net zero emissions. The uncertainty is increased by domestic and international challenges such as social licence and supply chain considerations. The spread of forecast outcomes is therefore wide across scenarios to reflect this uncertainty.

The project would help meet forecast increasing demand for energy in the NEM as forecast demand increases from 2025–2026 onwards through clean energy production, storage and transmission.



PON Clean Energy Precinct Concept Plan Scoping Report

Figure 2-1
Renewable Energy Zones within NSW (indicative)

Legend

- Project Site
- Renewable Energy Zones

0 125 250 Kilometers

Coordinate system: GCS GDA 1994

Scale ratio correct when printed at A3

1:5,000,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Geoscience Australia

2.5 Consistency with strategic planning and policy

2.5.1 Australian government policy context

2.5.1.1 Climate change policy

On 10 November 2016, Australia ratified the United Nations Paris Agreement and the Doha Amendment to the Kyoto Protocol, representing the Australian Government's commitment to provide action on climate change, setting interim emission reduction targets. Since then, the Australian Government has committed to reduce emissions by 43 per cent below 2005 levels by 2030. In 2017, the Australian Government reviewed its climate change policies to ensure they remain effective in achieving Australia's 2030 target and Paris Agreement commitments.

The Australian government adopted the *Long-Term Emissions Reduction Plan* (Department of Industry, Science, Energy and Resources [DISER], 2021) to drive down cost of low emission technologies and help regional industries and communities move into new energy markets. COP26 was the 26th annual United Nations climate change Convention on Climate Change Conference of Parties (COP) held in Glasgow 2021 and Australia joined the Glasgow Breakthroughs Initiative, that sets global goals to make clean technologies the most affordable and accessible option before 2030.

The project would contribute to meeting Australia's commitments through enabling the production, storage, domestic distribution and international export of clean energy and the associated resultant annual reduction in GHG emissions. The project would also support other renewable energy projects in the region.

2.5.1.2 Integrated System Plan 2022

The ISP provides an integrated roadmap for development of the NEM over the next 20 years. The 2022 ISP outlines an optimal development path (ODP) to support the power system's transformation from oil and gas to renewables, batteries and other forms of firming capacity to 2050 (AEMO, 2022).

The project is located in proximity to three of the proposed renewable energy zones; the Central West Orana REZ, New England REZ and Hunter-Central Coast REZ. Connecting the project to one or more of these REZ's would support the build out of the REZ and facilitate renewable generation development to replace energy provided by retiring coal fired generators. Supporting the build out of the REZ's complements the energy transition and assists with energy security and a pathway to decarbonisation of industry in the Hunter region.

2.5.1.3 Large-scale Renewable Energy Target

The Large-scale Renewable Energy Target (LRET) incentivises development of renewable energy in Australia, through a market involving creation and sale of certificates known as Large-scale Generation Certificates (LGCs). Power stations accredited under the LRET can create LGCs for the electricity generated from renewable energy sources, that can then be sold to liable entities that must meet compliance obligations under the LRET. Once operational, the project would connect up to approximately 1.5 GW electricity that would be used for the production of clean energy.

The project would therefore seek to contribute to the LRET target of additional renewable energy to be generated annually.

2.5.1.4 Commonwealth Hydrogen Strategy

Australia's National Hydrogen Strategy (Council of Australian Governments Energy Council, 2019) sets a vision for a clean, innovative, safe and competitive hydrogen industry that benefits all Australians. The Strategy aims to:

- explore Australia's clean hydrogen potential
- consider future scenarios with wide ranging growth possibilities
- outline an adaptive approach that equips Australia to scale up quickly
- include nationally coordinated actions involving governments, industry and communities.

The project would enable development of clean, innovative, safe and competitive hydrogen and ammonia production for multiple potential uses. The project would utilise existing, common user shared infrastructure providing an efficient path for the hydrogen industry development and enables a path to scale up as the export opportunity grows.

2.5.2 NSW government policy context

2.5.2.1 Net Zero Plan Stage 1: 2020–2030

The *Net Zero Plan Stage 1: 2020–2030* (Department of Planning, Industry and Science, 2021) sets the foundation for NSW's action on climate change and how the NSW Government would deliver on its objective to achieve net zero emissions by 2050. The Plan outlines the NSW Government's plan to grow the economy and create jobs and is an overarching strategy to reduce emissions and mitigate the impacts of climate change.

The project would contribute to the NSW Government's Net Zero Plan by reducing NSW's GHG emissions and enabling clean, renewable energy development. The project would seek to deliver on the NSW Government's Plan to strengthen the prosperity and quality of life of people and would contribute to achieving NSW's objectives to deliver a 50 per cent reduction in emissions by 2030 compared to 2005 levels.

2.5.2.2 NSW Electricity Infrastructure Roadmap

The *NSW Electricity Infrastructure Roadmap* (EnergyCo, 2020) provides a coordinated framework for transition of the existing electricity sectors move to renewable energy sources. The roadmap builds on the 2019 *NSW Electricity Strategy* (DPIE, 2019) and the 2018 *NSW Transmission Infrastructure Strategy* (DPE, 2018) to streamline delivery of a low-cost, cleaner and more reliable energy system. There are three proximate REZ's to the project, including the Central West Orana REZ, the New England REZ and the Hunter-Central Coast REZ.

The project would support the build-out of these REZ's with an underpinning around 1.5 GW green electricity connection at the PON. The project would assist in meeting the NSW Government's emissions reductions targets, NSW's energy generation and storage requirements and NSW's transition from coal-fired power generation to renewable energy.

2.5.2.3 NSW Electricity Strategy

The NSW Government released its *NSW Electricity Strategy in 2019* (DPIE, 2019), that outlines a plan for a reliable, affordable and sustainable electricity system. The Strategy identifies challenges such as the existing fleet of power stations reaching the end of their technical lives, congestion in the transmission system and the location of areas with the strongest renewable resource potential being located away from the existing network.

Consistent with the Strategy, the project would support the build out of renewable energy production and storage capacity that, together with other renewable generation projects, would provide energy security and a decarbonisation pathway for the state.

2.5.2.4 NSW Transmission Infrastructure Strategy

The *NSW Transmission Infrastructure Strategy* (DPE, 2018) is the NSW Government's plan to unlock private sector investment in priority transmission infrastructure projects, which can deliver lower cost energy to customers through to 2040 and beyond. The Strategy aims to:

- increase NSW's energy capacity by prioritising Energy Zones in the Central-West, South-West and New England regions of NSW, which would become a driving force to deliver affordable energy into the future
- boost interconnection between Victoria, South Australia and Queensland, and unlock more power from the existing Snowy Hydro Scheme
- work with other states and regulators to streamline regulation and improve conditions for investment. By increasing transmission capacity and low-cost generation, NSW would support an orderly transition of the energy sector over the next two decades.

The project would support the broader build out of the proximate REZ's, resulting in an increase to NSW's renewable energy capacity. Further, it would provide renewable energy electrical infrastructure and long-term storage for both hydrogen and ammonia and other future energy vectors, complementing renewable generation.

2.5.2.5 State Infrastructure Strategy 2022–2042

The *State Infrastructure Strategy 2022–2042* (Infrastructure NSW, 2022) establishes the strategic directions, projects and initiatives to meet the infrastructure needs of a growing population and a growing economy. Key strategic objectives for the energy sector within the Strategy include:

- to achieve an orderly and efficient transition to net zero
- to successfully transitioning the energy and water sectors.

The project is aligned with this objective as it accelerates the build out of the REZ's within NSW.

2.5.2.6 NSW Climate Change Policy Framework

The *NSW Climate Change Policy Framework* (Office of Environment & Heritage [OEH], 2016) outlines NSW's long-term objectives to achieve net zero emissions by 2050 and to make NSW more resilient to a changing climate. The framework states that NSW would be part of the global transformation of the world's energy system and that boosting energy and resource productivity can reduce the impact of rising energy prices and the cost of transition to a net zero emissions economy.

The project is aligned with this framework, as it would provide a key piece of strategic infrastructure that would enable the transition to a lower emissions economy.

2.5.2.7 Renewable Energy Zone Access Schemes

REZ access schemes are a key part of the NSW Government's work to coordinate and encourage investment in REZs, and to realise objectives of the Electricity Infrastructure Roadmap and its enabling legislation.

REZ access schemes would:

- govern the volume of projects that may be granted access rights to connect to REZ scheme infrastructure
- enable investment in new, low-cost generation and storage projects by providing increased certainty
- create a streamlined connection process for projects (EnergyCo, 2022a).

The project would connect to one or more of the proximate REZs and would support broader objectives of the REZ.

2.5.2.8 Electricity Infrastructure Investment Act (2020)

Section 23 of the *Electricity Infrastructure Investment Act 2020* identifies REZs in NSW. The project site is located proximate to the Central West Orana REZ, the New England REZ and the Hunter-Central Coast REZ.

2.5.2.9 Hunter-Central Coast Renewable Energy Zone

EnergyCo is in the early stages of planning a REZ in the Hunter and Central Coast regions on the lands of the Awabakal, Bahtabah, Biraban, Darkinjung, Mindaribba, Wanaruah and Worimi people.

The proposed location of the Hunter-Central Coast REZ (shown in Figure 2.1) has been identified as a NSW priority energy zone. The Hunter-Central Coast REZ region has unique features that make it an ideal location, including excellent renewable energy resources that can utilise existing power stations, rehabilitated mining land, electricity network infrastructure, port and transport infrastructure and a skilled workforce (EnergyCo, 2022).

The project would be located within the Hunter-Central Coast REZ, with potential connection into the REZ providing additional renewable, low-cost energy to NSW.

2.5.2.10 NSW Hydrogen Strategy

The *NSW Hydrogen Strategy* (DPIE, 2021) is a framework that brings together the NSW Government's existing and new policies to support the development of a commercial hydrogen industry in NSW. The NSW Hydrogen Strategy sets out NSW's vision and path for developing a thriving green hydrogen industry. The policies set out in the strategy aim to:

- reduce the cost of green hydrogen by $5.80 per kg in the next decade
- provide up to $3 billion of incentives to support industry development
- deliver NSW 2030 targets of 110,000 tonnes of annual green hydrogen production and 700 MW of electrolyser capacity
- drive decarbonisation in transport, industrial and energy sectors to help achieve net zero by 2050.

The Strategy outlines the Hunter as having potential to be one of Australia's largest hydrogen hubs, due to its access to existing high voltage transmission infrastructure and the proximity to the REZ's.

The project is aligned with the NSW hydrogen strategy as it would:

- utilise existing infrastructure providing an efficient path for the energy transition and development of the hydrogen industry
- provide common user shared infrastructure for renewable energy projects
- provide jobs and new skills for the existing, highly trained Hunter workforce
- promote the establishment of a research and development innovation hub.

2.5.2.11 Hunter Regional Plan 2041

The *Hunter Regional Plan 2041* aims to ensure continued prosperity and wellbeing of the Hunter's vibrant and connected communities (DPE, 2022). The Plan builds on previous efforts and responds to this era of rapid change to promote sustainable growth, connections and resilience.

The Plan outlines the importance of PON acting as a global gateway, providing NSW the opportunity to access new markets. The Plan also outlines the importance of green hydrogen production to reposition the Hunter as a global leader in clean, zero-emission energy. Hydrogen hubs would decarbonise heavy transport fleets, support economic diversification and capture longer term opportunities for hydrogen in the export, steel electricity and synthetic fuel markets (DPE, 2022).

The project would assist NSW diversify and decarbonise existing industries and allow NSW to lead the hydrogen economy. The establishment of hydrogen production infrastructure is considered a critical component of the Hunter and NSW's transition to renewable energy and would be supported by this project.

2.6 Project need

PON has advised the port is the world's largest and most efficient energy export port with a reputation developed over decades. In 2018, trade through the port relied on a single commodity, coal, for 98 per cent of its volume and 71 per cent of port revenue. With the acceleration toward decarbonisation and away from fossil fuels, PON is now embarking on a transformation journey to remain a world leading energy export powerhouse with the goal to diversify its revenue streams to more than 50 per cent from trade other than coal by 2030.

The Clean Energy Precinct involves enabling the production, storage, distribution and export of clean energy using common user shared infrastructure. Fully constructed, the Clean Energy Precinct (the project) is expected to connect approximately 1.5 GW of green electricity, that has potential to be connected into the NEM and support the broader build out of the NSW REZ's, support domestic decarbonisation and continue to deliver energy security to our key markets in Asia.

The project provides another critical step in Australia's transition to renewable energy. Investment in new renewable energy infrastructure would provide NSW with affordable, reliable, secure and clean energy for the future. The project is consistent with the NSW Government and Federal Government's targets for the reduction of GHG emissions and investment in clean energy technology and supports regional investment and development.

The NSW REZ's are a critical step in the process to provide infrastructure that gives certainty to developers that there would be sufficient transmission capacity to distribute and sell their energy. The project would contribute to development of the REZ resulting in an increase to NSW's renewable energy capacity.

PON has identified the Hunter region as being perfectly placed to become Australia's clean energy powerhouse, as it provides strategic advantages that could be leveraged for clean emerging including:

- existing infrastructure, with PON that there is excellent existing infrastructure adjacent to the port and could supply up to 1.5 GW of green electricity for clean energy production
- existing supply chains
- the region's skilled workforce who would possess relevant skills to become the backbone of the clean energy industry.

PON has identified the project is needed to provide critical infrastructure for the development of a Clean Energy Precinct and other renewable projects in the region.

2.7 Key benefits of the project

The project would support the build out of renewable energy infrastructure that would help deliver low-cost, renewable energy to the NEM and would contribute to the Commonwealth and NSW Government's emission reduction targets by:

- enabling the production, storage, distribution and export of clean energy to supplement NSW and national energy requirements, supporting transition away from coal-fired energy to renewable energy production and assisting in reducing GHG emissions
- providing jobs and new skills for transitioning the existing Hunter workforce
- utilising existing infrastructure providing an efficient path for the energy transition and development of the clean energy industry
- providing energy security and a decarbonisation pathway for heavy industry
- providing a path to scale quickly as the export opportunity emerges
- complementing the energy transition accelerating the build out of renewable energy
- providing opportunity for research and innovation in clean energy technology in NSW and Australia
- allowing for ongoing investment into clean energy.

The project would deliver benefits to the local region and communities including:

- direct investment in the Newcastle region
- job opportunities throughout development of the Clean Energy Precinct would provide up to 5,261 jobs and during operation of the Clean Energy Precinct (once fully constructed) up to 539 ongoing jobs
- providing re-deployment opportunities for the workforce away from GHG intensive heavy industries within the Hunter Valley
- re-using historical waste lands located at the port for production of clean energy
- enabling development of the clean energy supply chain in the region
- re-using and re-purposing existing infrastructure and assets
- providing open access, common user, shared infrastructure at lowest cost practicable
- development of new skilled labour in the region within the growing renewable energy industry.

2.8 Project development and feasible alternatives

As part of the development of the project, feasible alternative options have been assessed, including:

1. Do nothing option
2. Alternate energy option
3. Alternate siting of the Clean Energy Precinct option
4. Proposed Clean Energy Precinct option.

The key attributes of the project site outweigh each of the alternatives that have been evaluated.

2.8.1 Do nothing option

The 'do nothing' approach that comprise of no change to the land use at KIWEF i.e. the project would not be developed. Without the project going ahead, the local and wider region would not realise the benefits of the project including providing jobs and new skills, new pathways to scale as the export opportunity emerges and contribution to renewable energy including more efficient energy and lower electricity costs.

The 'do nothing' option does not meet NSW renewable energy objectives and would lead to a missed opportunity to produce, store and export clean energy vectors. This option would also not provide opportunities to contribute to the NEM and the NSW REZ's.

From a local port perspective, lands remediated by the NSW Government and handed back to PON would not be used to drive economic growth and prosperity within the region. The remediated lands would need to be managed with ongoing costs for the maintenance.

The 'do nothing' option does not contribute to reducing GHG emissions and therefore does not contribute to limiting the impacts of climate change.

2.8.2 Alternate energy option

Both the NSW Government and the Commonwealth Government have committed to reducing GHG emissions to limit the impact of climate change. The project would enable development of REZ's within the state by underpinning up to 3 GW of renewable energy.

The former KIWEF is the optimum site for the project due to the following:

- proximity to approximately 70 per cent of NSW electricity generation
- proximity to three proposed NSW REZ's
- access to multiple sustainable water solutions (including recycled water and desalination)
- vacant land with adequate separation distance from sensitive receptors and good access to power, water, utilities and berths
- deep water port operating at 50 per cent capacity
- a highly skilled, local workforce
- a community proud of its industrial heritage and desire to develop the clean energy economy.

The alternative energy option to using clean energy would be to continue to use fossil fuels (such as coal and natural gas). The reliance on these forms of energy would result in continued release of GHG emissions into the atmosphere. The continued use of fossil fuels for energy would not aid in Australia's commitment to limit the impact of climate change.

2.8.3 Alternate siting of the Clean Energy Precinct option

As part of initial feasibility studies on the siting of green hydrogen and ammonia facilities at PON, a multi criteria analysis (MCA) was carried out on three precincts within the port. Of the three precincts evaluated, two of the precincts were discounted for being established as a Clean Energy Precinct due to either insufficient separation distance to residential areas and/or constrained access to utilities (such as power, water and gas pipelines).

KIWEF, the proposed site for the project was identified as the most suitable site due to:

- large area of available land seeking development
- ability to scale (due to land availability) as international demand for clean energy evolves
- proximity to existing or proposed transmission networks (such as electricity transmission lines)
- proximity to port and shipping operations
- proximity to transport infrastructure
- appropriate separation distance to sensitive receptors including residential areas.

Following identification of KIWEF as the preferred precinct, an overall preliminary concept plan layout has been developed considering site specific constraints. The key constraints identified at the site included:

- maximising separation distances between major hazards storage facilities (for example, ammonia and hydrogen storage tanks) from sensitive receptors (for example residential areas, other port users and public transport corridors)
- locating new electrical infrastructure near existing electrical network transmission infrastructure
- locating the Clean Energy Precinct near existing water and wastewater infrastructure
- avoiding areas and minimising impact to biodiversity including threatened ecological communities (particularly Green and Golden Bell Frog and Ramsar wetlands)
- avoiding areas of high contamination or areas that are required to vent to the atmosphere due to contaminants contained within those areas.

The EIS and associated technical assessments would further assess identified constraints to facilitate detailed design refinements in response to the identified values and constraints, as well as strategies to mitigate potential impacts.

Based on the above, alternate siting of the project would not be viable and therefore would not contribute to the reduction in GHG emissions and minimise the impact of climate change.

2.8.4 Proposed Clean Energy Precinct (preferred option)

The project would contribute to Australia's transition to clean energy and would contribute to NSW objectives to achieve net zero emissions by 2050 and to make NSW more resilient to a changing climate. The project would also deliver potential financial and social benefits to a regional NSW community. The project site is suitable for the proposed Clean Energy Precinct due to its close proximity to shipping and port operations, utilities and services, transport, accessibility and existing compatible land uses of the site and surrounding areas of Kooragang Island and location within the Hunter-Central Coast REZ and proximity to the New England and Central West Orana REZ's.

The project would utilise existing infrastructure with capacity, local skilled labour force and local manufacturing opportunities to provide efficient and lower cost and cleaner energy to the region and to NSW.

2.9 Potential cumulative impacts

The purpose of a cumulative impact assessment is to assess project specific impacts from an existing baseline condition as well as combined impacts of the project with other known or foreseeable future developments. The cumulative impacts of the project would be assessed in the EIS in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022). The guidelines provide a framework for assessing and managing project-level cumulative impacts.

A search on DPEs online major projects database was carried out in March 2023 to identify SSD and State Significant Infrastructure (SSI) projects in the locality. Development within 20 km of the project site is discussed in Section 6.18 and Table 6.14.

3 Project description

This chapter describes the proposed Clean Energy Precinct (the project) including construction and operation and associated activities such as enabling works and property identification.

The design and layout of the project is provided, including development of design criteria and principles. The current design for the project is described in this chapter; however, further design refinement is required and would occur following the lodgement of the Scoping Report.

3.1 Project overview

PON is seeking Concept Plan approval for a new Clean Energy Precinct (the project).

The main components of the Concept Plan are outlined in Table 3.2 and Figure 3.1, and include the following:

- infrastructure
- green hydrogen production and storage
- green ammonia production and storage
- expansion of storage of other clean energy products
- utility easements within the Clean Energy Precinct
- internal roads and car park
- administration buildings
- warehousing and laydown facilities.

Potential development at the site is expected to be carried out in a staged approach (outlined in Table 3.3). Indicative stages of development include:

- Stage 1: hydrogen production and storage and ammonia production and storage
- Stage 2: expansion of storage and facilities for export
- Subsequent stages would be refined based on the development of new clean energy technologies and market demand. Further expansion of the Clean Energy Precinct may also include establishing an Innovation Hub ancillary to activities within the Clean Energy Precinct.

A separate development application has been submitted for infrastructure and ammonia storage within the proposed Clean Energy Precinct.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 3-1
Concept Plan Layout

Legend

- Project Site

Proposed Staging

- Stage 1 (Hydrogen and Ammonia Production and Storage)
- Stage 2 (Expansion of Storage)
- Stage 3 (Innovation Hub)
- Green Corridor
- Green and Golden Bell Frog Habitat
- Infrastructure and Ammonia Storage (Subject to separate approval)
- Electrical Transmission Corridor
- Road, Utilities and Pipeline Corridor
- Road
- Watercourse

Clean Energy Storage will be subject to the development of the domestic and international clean energy market as well as how the emerging technolog, storage, distribution and transport infrastructure evolves over time and will be subject to change and design refinement.

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 6/09/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

3.2 Project context and location

3.2.1 Study area

The project site is comprised of an area approximately 228 hectares. The project site is approximately 170 km (by road) north of Sydney and approximately 760 km south of Brisbane. The project site is within the City of Newcastle LGA and Awabakal Local Aboriginal Land Council at the former KIWEF. The site is currently zoned SP1 – Special Activities under the State Environmental Planning Policy (Transport and Infrastructure) 2021 (see Section 4.1.1 for further detail).

The project site includes the sites listed in Table 3.1, surrounding areas of port infrastructure, residential, commercial and industrial land uses as well as conservation and aquatic environments within 5 km of the project site. There are some occasions where desktop searches would extend further including 10 km for EPBC and 100 km for developments that may result in cumulative impact on the project.

3.2.2 Site

The project site is relatively flat with low relief, at an elevation of approximately 12 metres above sea level. Existing land uses of the project site and surrounds are predominately industrial, shipping and port operations. The site was previously used by BHP Newcastle Steelworks as a landfill site from the late 1960's up to 1999 when BHP ceased operations. Some areas of KIWEF have been remediated with capping and related environmental improvement works to close the landfill.

The site is located adjacent to the Hunter Wetlands National Park within the lower estuarine reaches of the Hunter River, and within proximity to habitat of the Green and Golden Bell Frog (discussed further in Section 6.2). The wetland system in the National Park is of international importance and listed under the Ramsar Convention on Wetlands (DPE, 2023a).

A number of residential suburbs surround the site including Stockton approximately 5 km east of the project site (and across the Hunter River), and Tighes Hill, Carrington, Mayfield and Mayfield East situated approximately 1.5–2 km south of the site across the Hunter River South Channel.

The lots within the project site are detailed in Table 3.1.

Table 3.1 Project site Lot and DP details

Deposited Plan (DP)	Lot(s)
DP1155723	22
DP1207051	3, 7
DP1184229	29, 30, 31, 32, 33
DP119752	8
DP262783	16

3.2.3 Key features of the site

3.2.3.1 Local and regional community

The project would be located in the City of Newcastle LGA. An overview of the project's regional context is provided in Figure 1.1.

The project site is approximately 6 km from the Newcastle Central Business District (CBD). Health Care and Social Assistance are the most common industries worked in by residents in Newcastle, followed by education and training, retail trade, construction and accommodation and food services (Australian Bureau of Statistics [ABS], 2021). The mining industry accounted for just two per cent of employed persons aged over 15 years old in Newcastle (ABS, 2021).

Employment in Newcastle includes 29 per cent of people employed as Professionals, 13.4 per cent are Community and Personal Service Workers, 12.1 per cent are Technicians and Trades Workers and 11.6 per cent are Clerical and Administrative Workers. Other occupations include Managers, Sales Workers, Labourers and Machinery Operators and Drivers (ABS, 2021).

3.2.3.2 Features of the natural and built environment

The project is located within the regional city of Newcastle NSW. The site is located on the former KIWEF, located on Kooragang Island, that extends from Stockton in the southeast to the north-eastern bridge at Hexham and is predominantly flat with a slight slope towards the Hunter River South Channel. Majority of the project site is heavily disturbed, with some existing vegetation on the southern borders. Portions of the site contain habitat for the Green and Golden Bell Frog that is listed as vulnerable under the EPBC Act and endangered under the *Biodiversity Conservation Act 2016* (BC Act). Refer to Section 6.2 for further discussion on biodiversity.

The site is bounded by wetlands, including Ramsar wetlands, to the north and west, Hunter River South Channel to the south and the Newcastle Coal Infrastructure Group (NCIG) terminal is directly east of the site. This NCIG terminal receives inbound coal, that is stacked in the stockyard prior to exportation.

On the opposite bank of the Hunter River South Channel, approximately 340 metres south of the site, the land is primarily zoned IN1 – Industrial and comprises local industrial businesses such as Benedict Recycling Plant and multiple warehouses. The nearest residential receiver is approximately 870 metres southwest of the site on Maitland Road.

The proposed Clean Energy Precinct Concept Plan falls within the PON Lease Area.

3.2.3.3 Current port activities

PON operates within an industrial precinct surrounded by predominantly other businesses complementary to port operations.

Current activities at the Port include the following:

- trade and port development
- management of 792 hectares of port land
- wharf and berth services including channel capacity for more than 2,500 vessels per year
- maintenance of major port assets
- vessel scheduling
- dredging and survey services
- cruise shipping
- legal, planning and environmental management
- finance
- community and stakeholder relations.

PON currently operates 20 berths and has total land holdings of 792 hectares, including 200 hectares of vacant PON land. The port currently handles 4,697 ship movements and 166 million tonnes of cargo annually, and with a Deepwater shipping channel operating at 50 per cent of its capacity, significant port land available and access to national rail and road infrastructure. PON is positioned to further underpin the future of the Hunter, NSW and Australia (PON, 2022).

3.2.3.4 Existing major infrastructure

Existing major infrastructure within the project study area includes:

- Cormorant Road (adjacent to existing site) and other internal roads
- KIWEF site which is a former BHP landfill site that received waste from the Newcastle Steelworks
- NCIG and PWCS rail balloon loops
- Transgrid and Ausgrid 330 kV and 132 kV networks
- Hunter Water, water supply and sewerage networks
- Conexa recycled water network
- Jemena gas network.

Other major infrastructure near the project study area include:

- Newcastle Coal Infrastructure Group (NCIG) coal stockpiles
- coal export berths from Kooragang Berth 4 (K4) through to K10
- navigation channel and turning circle
- mixed use Kooragang Berths K2 and K3
- Mayfield Bulk Liquids Berth 7 (M7) and associated storage facilities
- Mayfield Berth 4 (M4) and associated hardstand and laydown areas
- road and rail infrastructure
- Kooragang Island Coal Terminal
- Orica site including ammonia plant, nitric acid plants, two ammonium nitrate plants and a product dispatch facility
- BOC
- Cargill
- Ameropa
- Incitec Pivot Limited.

3.2.3.5 Risks and hazards

Key risks and hazards within the existing environment include:

- storage and transport of dangerous goods and hazardous materials
- biosecurity risks
- traffic and transport on existing roads and rail
- port and shipping operations.

A preliminary risks and hazards assessment has been undertaken and is provided in Section 6.1.

3.3 Key components of the project

Key components of the project are summarised in Table 3.2 and presented in Figure 3.1, potential stages of the project are summarised in Table 3.3 and building and structure details are summarised in Table 3.4.

Table 3.2 Summary of key components of the project

Component	Description
Concept development application	
Concept plan – Clean Energy Precinct	PON is seeking to establish a shovel-ready Clean Energy Precinct that enables production, storage, distribution and export of hydrogen and ammonia using common user shared infrastructure. Establishment of the Clean Energy Precinct would also support the broader build out of renewable energy zone developments and other renewable projects in the region.

Table 3.3 Summary of indicative stages of development

Component	Description
Infrastructure and ammonia storage (assessed under a separate development application)	
Infrastructure	This project would involve the establishment of shared common user infrastructure to enable chemical storage and infrastructure within the port. Alignments for transmission power lines and water pipelines would be refined. The proposed infrastructure would involve: — electrical infrastructure, including grid connection, transmission infrastructure and associated easements and corridors, substation and switchyard — water infrastructure, including pipeline connection, pipeline infrastructure and associated easements and corridors for water and sewer — buildings including site buildings, administration buildings and warehousing — roads and paved areas including internal roads, car parking facilities, trailer storage yards and laydown areas.
Ammonia storage facilities	The project would include construction and operation of an ammonia storage facility and associated pipeline to support existing ammonia production facilities within the area. The ammonia storage facility is proposed to support development within the Clean Energy Precinct, other developments in the port and within the broader Hunter region. It would provide shared common user ammonia storage that would be connected by a pipeline that is subject to design refinement and consultation during the EIS phase. The storage facility is expected to be an approximately 30,000 tonnes double-walled ammonia storage tank..
Roads and car park	Internal roads: internal roads would be required to access the various process areas and the trailer staging area. The roads would be designed to accommodate prime movers coupled to a single semi-trailer and possibly B-doubles (prime mover coupled to two semi-trailers). A one-way road system would be implemented where practicable. Car park: a surfaced parking area would be required and would be approximately 945 m^2 (subject to design refinement). Trailer staging area: a trailer staging area (approximately 120 metres x 126 metres) for trailers would be required. The trailer staging area would be sized for approximately 55 trailers with additional area provided to allow for manoeuvring the prime movers across the site.

Component	Description
	Laydown area: a general laydown area would be provided with a minimum size of 500 metres by 100 metres. The laydown area would be gravel surfaced with some areas featuring a concrete pavement and would be fenced and gated. The laydown area would be available during the construction period, in addition to other areas used during construction for the purpose of laying down goods and materials.
Administration buildings	A common administration building, including a control room, would be provided. The approximate size of this would be 365 m^2. The building would feature the following areas: — control room — laboratory — reception area — first aid room — open plan offices — secure offices — information technology and server room — meeting room — tour hosting room — storage room — crib room — locker rooms — male and female facilities — disabled facilities.
Workshop	This project would provide a dedicated workshop facilities to carry out welding, grinding, lubrication, sheet metal working, and electrical testing. The workshop would feature a 10 tonne gantry crane to lift heavy goods and equipment and would provide access for a forklift truck. A small tool store would be incorporated into the workshop space. External to the workshop, there would be a dedicated lubricant storage bay, gas cylinder storage and air compressor. Adjacent to the workshop would also be a component wash bay. The workshop would have direct access to the laydown area by means of a roller door.
Warehouse	A dedicated warehouse/store would be provided for spares and stores that cannot be stored in the laydown area. The warehouse would feature racking and access by forklift truck and forklift battery charging bays. A fenced and secured storage area would be required within the warehouse for the storage of high value spares.
Indicative Stage 1 (subject to design refinement)	
Hydrogen Production and Storage Facilities	Establishment of hydrogen production and storage infrastructure. This infrastructure is a critical component of NSW's transition to clean and/or low emissions energy production. A hydrogen production facility is proposed in the northwest of the project site (see Figure 3.1). The proposed facility would produce green hydrogen and synthesise green ammonia. Hydrogen production facilities generally comprise: — a water treatment facility — electrolysers — hydrogen compression and drying equipment — hydrogen storage.

Component	Description
	The proposed hydrogen production facilities are subject to design refinement in the next stages of the project, but are envisaged to comprise of: — up to 750 MW of electrolysis capacity — electrolysers would be either alkaline or proton exchange membrane (PEM) type which are the two leading technologies in large-scale commercial electrolyser applications — production of up to 103 kilotonnes per annum (ktpa) of hydrogen — 21 ktpa of hydrogen production for distribution — 83 ktpa of hydrogen for ammonia synthesis — an area to allow up to 50 x 670 kilograms of hydrogen tube trailers.
Ammonia Production Facilities	The Clean Energy Precinct would include establishment of ammonia production infrastructure that is a critical component of NSW's transition to clean and/or low emissions energy. An ammonia production facility is proposed in the northwest of the site. The proposed facility would produce green ammonia. Ammonia production facilities generally comprise: — air separation unit — nitrogen gas compression — ammonia synthesis — loading and export systems. The proposed ammonia production facilities are subject to design refinement in the next stages of the project, but are envisaged to comprise of: — 425 ktpa of ammonia production — ammonia would be synthesised using nitrogen extracted from the air (from the air separation unit) and green hydrogen generated from electrolysis using the Haber-Bosch process.
Additional ammonia storage facilities	Construction and operation of additional ammonia storage facilities and associated infrastructure to support development within the Clean Energy Precinct, other developments and operations in the port as well as facilitate clean energy developments within the broader Hunter region. Storage is expected to comprise three, 30,000 tonnes double-walled ammonia storage tanks.The ammonia storage facilities would provide common user storage facility that would be connected by a pipeline that is subject to design refinement and consultation during the EIS phase.
Indicative Stage 2 (subject to design refinement)	
Expansion of storage and facilities for export	Expansion of the Clean Energy Precinct's capabilities for hydrogen storage, ammonia storage and infrastructure to support export of clean energy products. The expansion would involve common user storage facilities and associated pipelines that would be connected by a pipeline that is subject to design refinement and consultation prior to the Stage 2 EIS.
Subsequent stages (subject to design refinement, development of new technologies and market demand)	
Clean energy storage facilities	Potential expansion of the Clean Energy Precinct may include establishing storage facilities for clean energy sources. These potential storage facilities would be subject to the clean energy market developing and maturing, supply and demand market dynamics as well as how the associated emerging technology and, storage, distribution and transport infrastructure evolves. Any further expansion would be subject to future development applications. The Clean Energy Precinct needs appropriate flexibility to provide for emerging technologies and markets.

Component	Description
Innovation Hub	Potential further expansion of the Clean Energy Precinct may include establishing an Innovation Hub ancillary to activities within the Clean Energy Precinct. A Clean Technology Innovation Hub is proposed to accelerate research and development, innovation, industry development and support, workforce skills and training through a variety of business support resources, services and offerings and would include: — collaborative meeting space — Hydrogen Research and Innovation Facility (HyRIF) – research, prototyping, testing — training facilities — working space – start-ups, scale- ups — industry anchor tenants — operations and maintenance (facilities and services) — emergency response services.

3.4 Physical layout and design

The project comprises approximately 228 hectares and is expected to comprise the following infrastructure:

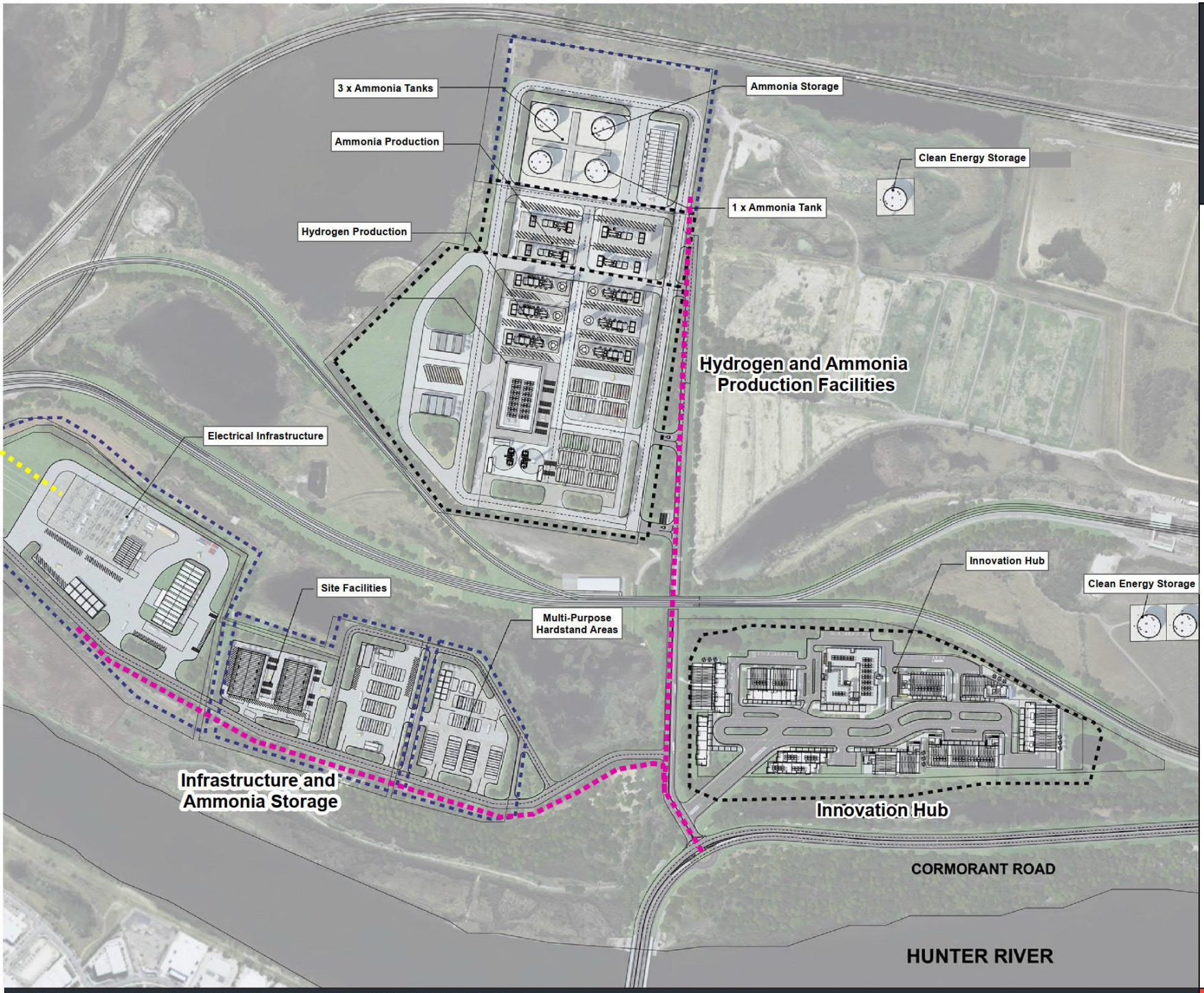
- green hydrogen production facilities
- green ammonia production infrastructure
- research and innovation hub
- parking for operational staff
- permanent site offices and amenities during operation, including control rooms, stores, warehousing and maintenance facilities.

The operational footprint is shown in Figure 3.2 and buildings are summarised in Table 3.4.

Table 3.4 Proposed buildings and structures

Building	Dimensions	Area	Approximate building height
Proposed infrastructure and ammonia storage (separate development application)			
Storage	30 x 68 metres	2,000 m^2	10 metres
Substation	50 x 30 metres	1,500 m^2	10 metres
Warehouse	120 x 40 metres	4,800 m^2	10 metres
Workshop	63 x 80 metres	5,000 m^2	10 metres
Warehouse stores	63 x 80 metres	5,000 m^2	10 metres
Storage	20 x 36 metres	700 m^2	10 metres
Warehouse	22 x 50 metres	1,100 m^2	10 metres
Site office	23 x 12 metres	275 m^2	10 metres
Ammonia tank	30,000 tonnes		40 metres

Building	Dimensions	Area	Approximate building height
Indicative Concept Plan			
Administration building	118 x 62 metres	7,300 m^2	10 metres
Shed	30 x 54 metres	1,600 m^2	10 metres
Shed	58 x 80 metres	1,600 m^2	10 metres
Hydrogen production infrastructure	102 kilotonnes per annum	37,400 m^2	10 metres
Ammonia production infrastructure	422 kilotonnes per annum	28,100 m^2	10 metres
Storage tanks	90,000 tonnes (plus 30,000 tonnes separate application)		40 metres
Warehouse	110 x 42 metres	4,600 m^2	10 metres
Gate house	16 x 10 metres	160 m^2	10 metres
Flare	Subject to design	Subject to design	45 metres



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PON Clean Energy Precinct
Concept Plan Scoping Report

Figure 3-2
Concept Plan

Legend

- Road, Utilities and Pipeline Corridor
- Electrical Transmission Corridor

Data sources: - PON, alfano-studio 2023, Geoscience Australia

3.5 Construction of the project

3.5.1 Project timeframes

The program would continue to be refined and would be further considered in subsequent separate development applications for each stage of the Concept's development.

3.5.2 Construction methodology

Construction activities (subject to separate development applications) would be generally undertaken within the identified project site (see Figure 3.1). Ancillary sites, in particular large centralised staging and accommodation facilities, may be located outside this project site.

In total, construction of all stages of the Clean Energy Precinct is expected to require approximately 5,261 construction workers. However, the construction workforce at any one time would vary depending on the stage of construction and associated activities.

3.5.3 Construction plant and equipment

An indicative list of construction plant and equipment likely to be required for the key construction elements is provided below. Not all the equipment identified below would be required for all phases of the project.

- Air compressors
- Backhoes
- Bob cats
- Bulldozers
- Concrete batch plants
- Concrete agitator
- Concrete pump
- Cranes (various sizes)
- Dumper trucks
- Elevated work platform
- Excavators (various sizes)
- Flatbed hiab trucks
- Fuel trucks
- Generators
- Graders
- Helicopter and associated support plant/equipment
- Piling rigs
- Pneumatic jackhammers
- Rigid tippers
- Rollers
- Semi-trailers
- Tilt tray trucks
- Trenchers
- Transport trucks
- Watercarts.

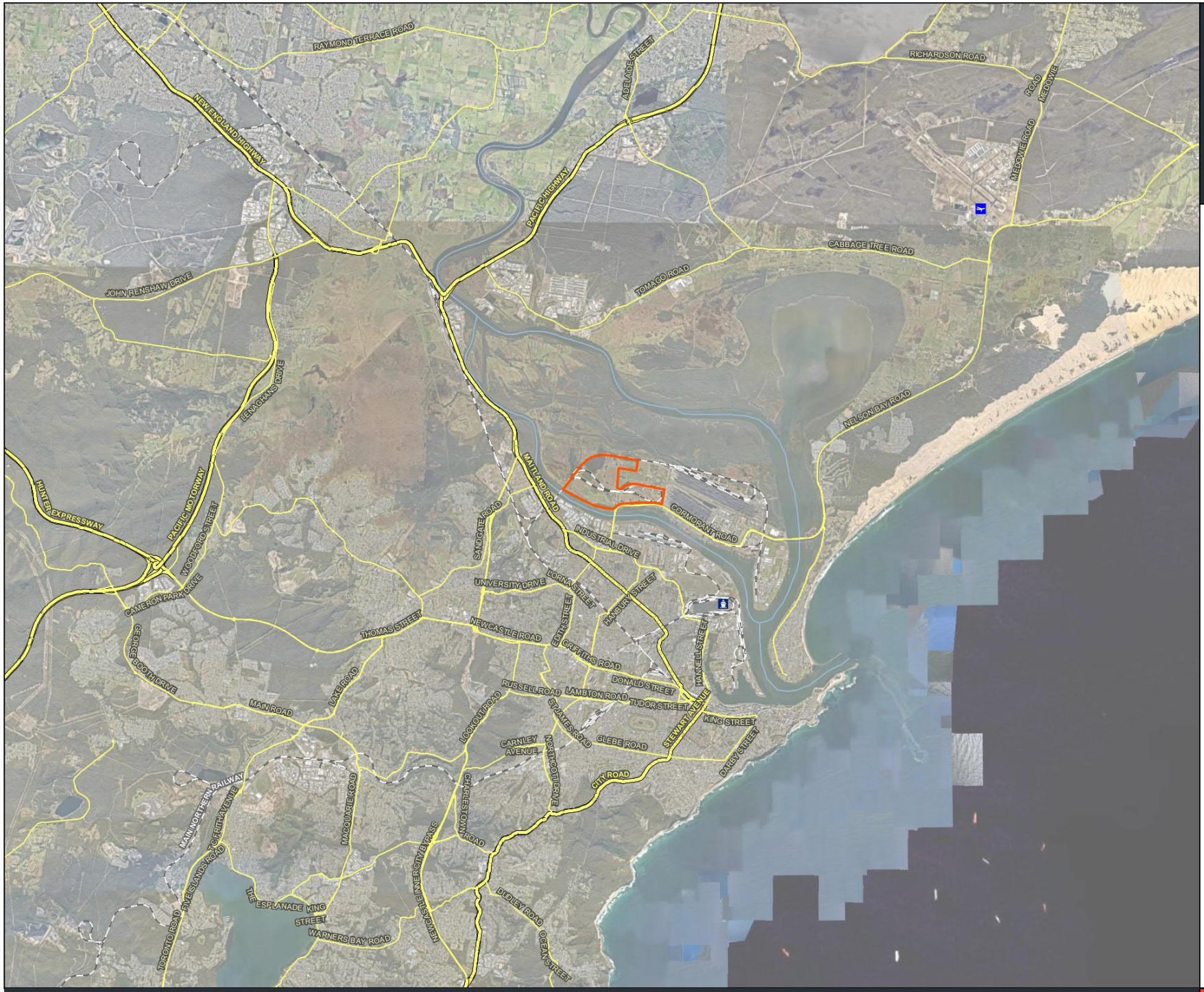
3.5.4 Construction hours

It is proposed that the works would generally be undertaken across a six-day work week between 7 am and 7 pm, during both standard and non-standard construction hours.

3.5.5 Construction traffic

Construction vehicle movements would comprise vehicles transporting equipment, waste, materials and spoil, as well as worker's vehicles. Larger volumes of heavy vehicles would occur during the main civil construction works associated with the construction of the precinct. Primary access to the project site would be from Industrial Drive and Cormorant Road, with potential secondary access from Nelson Bay Road from the north.

The haulage (transit) routes for project related vehicle trips would use much of the surrounding road network between the project study area from the main port area. Indicative haulage routes are provided in Figure 3.3. Haulage routes and traffic, transport and access would be assessed and confirmed as part of the EIS process.



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PON Clean Energy Precinct
Concept Plan Scoping Report

Figure 3-3
Surrounding Road Network
and Potential Haulage Routes

Legend

- Port
- Williamtown Airport
- Waterway
- Railway
- Arterial Road
- Sub-Arterial Road
- Project Site

0 2.5 5 Kilometers

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:100,000 Date: 27/07/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

3.6 Operation and maintenance

Operation of the Clean Energy Precinct (once fully constructed) would involve a core permanent workforce of 539 workers. The majority of maintenance activities would be for preventative maintenance, and activities would include:

- regular inspection of electrical infrastructure
- regular inspection of water and sewer infrastructure
- regular inspection of buildings and amenities
- regular inspection of roads, laydown areas and other areas as appropriate
- regular inspection of storage tanks
- regular inspection of pipelines
- regular inspection of emergency response systems
- regular inspection of stormwater management systems.

3.6.1 Water supply and requirements

PON is working on an integrated water solution to accommodate water volumes as the project scales. This would evaluate potable, recycled and desalinated sources for various uses within the Clean Energy Precinct. Where practicable, it is the PON's preference to utilise sustainable recycled water sources which are currently discharged by ocean outfall. Design refinement during the EIS would include refinement of the water supply for both the electrolysers (that require ultra-pure water) and for the cooling towers (that require greater volumes of water). Table 3.5 provides indicative total water demands associated with the project (subject to design refinement).

Table 3.5 Expected water requirements

Year	Total electrical demand (MW)	Electrolyser electrical demand (MW)	Total water demand (ML/d)	Wastewater discharge (ML/d)
2026	150	75	2.3	0.2
2028	1,500	750	22.6	1.8

3.7 Decommissioning, rehabilitation or repowering

If the site were to be decommissioned at the end of life, the process would be undertaken in accordance with all relevant legislation, regulations and requirements including any conditions of approval.

4 Statutory context

Environmental planning approval for the project is required in accordance with the EP&A Act, EPBC Act and other relevant statutory requirements.

Relevant statutory requirements for the project would be outlined in the EIS.

This chapter presents planning approvals and relevant legislation and guidelines that would need to be applied for by PON to gain approval for the Concept Plan.

4.1 Power to grant approval

Approval for the project is sought under Part 4, Division 4.4 (concept development application) of the EP&A Act, Section 4.22 (1) of the EP&A Act states:

> *a **concept development application** is a development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications.*

Under Clause 5.27 (1) of the Transport and Infrastructure SEPP, a development is classified as SSD if:

> *(a) it is carried out on land within the Lease Area or on unzoned land under this Chapter, and*
>
> (b) *it is, by operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
>
> *(c) it has a capital investment value of more than $100 million or it is designated development (other than development specified in clause 28(c) or 30 (shipping facilities) of Schedule 3 to the Environmental Planning and Assessment Regulation 2000).*

The project would have a capital investment value of approximately $1.8 billion and would be carried out in the Lease Area and would be considered SSD.

The consent authority for the project is the Minister for Planning and Public Spaces, their delegate or the Independent Planning Commission (IPC).

4.1.1 Permissibility

The project site is zoned SP1 Special Activities under the Transport and Infrastructure SEPP. A number of land uses are permitted in the zone or permitted by not being prohibited. Heavy industry is a type of development not specified in item 2 ‘Permitted without consent’ or 4 ‘Prohibited of the Land Use Table’ in the SP1 zone and as such are permitted with consent.

According to the Standard Instrument – Principal Local Environmental Plan:

> **heavy industry** means a building or place used to carry out an industrial activity that requires separation from other development because of the nature of the processes involved, or the materials used, stored or produced, and includes—
>
> (a) hazardous industry, or
> (b) offensive industry.

Stages of the Concept Plan would involve potential production and storage of hydrogen and ammonia being considered a type of heavy industry. The Innovation Hub would be considered ancillary to heavy industry as it involves research and development of advanced engineering technology, research into emerging clean energy technology and would link to private industry and academia research activities. As such, heavy industry and activities proposed within the Concept Plan are permitted in the SP1 zone with consent.

The objectives of the SP1 zone include to:

- provide for special land uses that are not provided for in other zones
- provide for sites with special natural characteristics that are not provided for in other zones
- facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land
- maximise the use of waterfront areas to accommodate port facilities and industrial, maritime industrial, freight and bulk storage premises that benefit from being located close to port facilities
- enable the efficient movement and operation of commercial shipping and to provide for the efficient handling and distribution of freight from port areas through the provision of transport infrastructure
- provide for port related facilities and development that support the operations of Port Botany, Port Kembla and the Port of Newcastle
- facilitate development that by its nature or scale requires separation from residential areas and other sensitive land uses
- encourage employment opportunities.

The project is consistent with each of the objectives of the SP1 zone stated above.

4.1.1.1 Electricity Infrastructure Investment Act (2020)

Section 23 of the *Electricity Infrastructure Investment Act 2020* identifies REZs in NSW. The project site is proximate to three of the REZ's, including the Central West Orana REZ, the New England REZ and the Hunter-Central Coast REZ.

4.1.2 NSW Environmental Planning Legislation and Approvals

Division 4.4 of the EP&A Act provide for the approval pathway for concept development applications. Environmental assessment in the form of an EIS with specialist assessments and consultation would be required for the project in accordance with Part 4, Division 4.4 of the EP&A Act and Part 8 Division 5 of the EP&A Regulation.

Prior to determination, the project would be subject to a comprehensive environmental impact assessment (the EIS) with extensive community engagement. Determination of the project would involve assessing the economic, environmental and social impacts, objects of the EP&A Act and the principles of ecologically sustainable development.

An EIS would be prepared and submitted in accordance with the SEARs (when issued). A referral under the Commonwealth EPBC Act would be submitted to the DCCEEW. If the project is determined to be a controlled action, the approval of the Commonwealth Minister for the Environment would be required in addition to the SSD consent. It is considered likely that if the project is considered a controlled action under the EPBC Act, the project would be assessed in accordance with the NSW Assessment Bilateral Agreement.

The EIS would be publicly exhibited for a minimum of 28 days and comments would likely be addressed through preparation of a Submissions Report.

4.1.3 Planning approval pathway

The proposed Clean Energy Precinct would include heavy industry and electricity generation that would involve a range of activities associated with generating and storing renewable energy (subject to future SSD applications), including:

Heavy industry:

- hydrogen production and storage
- ammonia production and storage
- electrical infrastructure
- port related activities
- research and development and innovation precinct (Innovation Hub).

Part 4 Division 4.4 Section 4.22(1) of the EP&A Act provides for assessment and approval of a concept development application. Under Section 4.22(5) of the EP&A Act the consent authority would need to only consider the likely impact of the concept proposal (and any first stage of development included in the application) and does not need to consider the likely impact of the carrying out of development that may be the subject of subsequent development applications.

Table 4.1 identifies NSW approvals that may be required for the project.

Table 4.1 Other NSW approvals that may or may not be required for the project

Requirement of provision	Application of provision
Approvals that are not required	— a permit under Sections 201, 205 or 219 of the *Fisheries Management Act 1994* (FM Act) — an approval under Part 4, or an excavation permit under Section 139 of the *Heritage Act 1977* — an Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974* (NPW Act) — a bush fire safety authority under section 100B of the *Rural Fires Act 1997* — various approvals under the *Water Management Act 2000*, namely a water use approval under Section 89, a water management work approval under Section 90, and an activity approval (other than aquifer interference approvals) under Section 91.
Approvals that should be applied consistently	— an environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* — a consent under Section 138 of the *Roads Act 1993* — a licence under the *Pipelines Act 1967*.

4.2 Mandatory matters for consideration

4.2.1 Applicable NSW Environmental Planning Instruments

The consent authority is required to consider a range of matters when deciding whether to grant consent for the project. These are referred to as mandatory considerations, which are detailed in Table 4.2.

Table 4.2 Environmental Planning Instruments relevant to the project

Environmental planning instrument	Relationship to project
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)	Chapter 2 of the Resilience and Hazards SEPP includes provisions that relate to coastal management. The study area contains and is adjacent to land mapped as 'Coastal Wetland' and 'Coastal Wetland Proximity Area'. Potential impact on wetlands would be considered through design refinements and within the EIS. Chapter 3 of the Resilience and Hazards SEPP includes provisions that define and regulate the assessment and approval of potentially hazardous or offensive development. A preliminary hazard analysis (PHA) would be required for the project as it is classified as 'potentially hazardous industry.' The PHA would determine the risks to people, property, and the environment and need for further assessment.

Environmental planning instrument	Relationship to project
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)	The Biodiversity and Conservation SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for *Phascolarctos cinereus* (Koala). The City of Newcastle LGA is listed in Schedule 2 of the Biodiversity and Conservation SEPP as being within the Central Coast Koala Management Area. There is a low likelihood of occurrence of Koala's within the site due to the former extensive disturbance and minimal habitat; however, a Preliminary Biodiversity Assessment has been prepared and is summarised in Section 6.2 and provided in Appendix A.

4.2.2 Local Environmental Plans

The project would be located in the City of Newcastle LGA. However, the project would not need to consider provisions of the Newcastle Local Environmental Plan (LEP) 2012.

4.2.3 Other NSW planning legislation

Table 4.3 presents other NSW legislation that may be applicable regardless of the project being declared SSD.

Table 4.3 Other NSW planning legislation of potential relevance to the project

Legislation	Requirement
Aboriginal Land Rights Act 1983	This Act establishes the NSW Aboriginal Land Council and Local Aboriginal Land Councils. Aboriginal heritage is discussed in Section 6.3.
Biodiversity Conservation Act 2016 (BC Act)	The BC Act aims to maintain a healthy, productive and resilient environment for the well-being of the community. A Preliminary Biodiversity Assessment has been prepared and is summarised in Section 6.2 and provided in Appendix A.
Biosecurity Act 2015 (Biosecurity Act)	The *Biosecurity Act 2015* provides for risk-based management of biosecurity in NSW through prevention, elimination and minimisation of biosecurity risks. The project falls under the *Hunter Regional Strategic Weed Management Plan 2017-2022* and the *Hunter Regional Strategic Pest Animal Management Plan 2018-2023*. Ongoing weed management would be considered in the EIS.
Coastal Management Act 2016	The Act seeks to manage the coastal environment of NSW. The project is located in the coastal area and potential impact on the coastal environmental would be considered through design refinements and within the EIS.
Contaminated Land Management Act 1997 (CLM Act)	The CLM Act outlines the circumstances in which notification to EPA is required in relation to the contamination of land. This may be relevant for this project during construction and/or operation and would be discussed in the EIS. There is known contamination at the site as summarised in Section 6.14. Approval from the site auditor would be required prior to any foundations or works associated with breaching the cap.
Crown Land Management Act 2016	This Act sets out the requirements for the management of Crown land in NSW. Crown land is mapped for the Hunter River South Channel that is directly south of the project. There are no known areas of Crown land within the project site.

Legislation	Requirement
Fisheries Management Act 1994 (FM Act)	The FM Act provides for the protection, conservation, and recovery of threatened aquatic species defined under the Act. The project would need to consider the FM Act, with Key Fish Habitat (KFH) mapped in the Hunter River and surrounding estuaries.
National Parks and Wildlife Act 1974 (NPW Act)	The NPW Act aims to conserve nature and objects, places or features of cultural value. The site is located adjacent to the Hunter Wetlands National Park and potential impact on this park would be considered in the EIS. Aboriginal heritage is discussed in Section 6.3.
Native Title (NSW) Act 1994 (Native Title Act)	The *Native Title Act 1993* provides a legislative framework for the recognition and protection of common law native title rights. Aboriginal heritage is discussed in Section 6.3.
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act establishes, among other things, pollution management, pollution incident reporting and environment protection licences on aspects such as waste, air, water and noise pollution control. Licensing requirements for the project (such as an Environment Protection Licence (EPL)) would be considered in consultation with the EPA and confirmed in the EIS. Construction activities would comply with the requirements of the POEO Act and appropriate management and mitigation would be identified in the EIS.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	The WARR Act aims to ensure that waste management options are considered under the following waste management hierarchy: **1** avoidance of unnecessary resource consumption **2** resource recovery (including reuse, reprocessing, recycling and energy recovery) **3** disposal. Waste avoidance and resource recovery would be considered in the EIS.

4.2.4 Ecologically sustainable development

Part 8, Division 5 (Clause 193) of the EP&A Regulation and Section 6(2) of the *Protection of the Environment Administration Act 1991* outlines the four principles of ecologically sustainable development (ESD). The four ESD principles comprise the precautionary principle; intergenerational equity; conservation of biological diversity and ecological integrity; and improved valuation, pricing, and incentive mechanisms.

PON would consider the principles of ESD in design development and refinement of the project. A discussion of how the project has considered ESD principles and how these are incorporated into the project would be included in the EIS.

4.2.5 Commonwealth legislation

4.2.5.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a national framework for environmental protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places (including internationally recognised Ramsar wetlands). Under the EPBC Act, proposed actions with the potential to significantly impact Matters of National Environmental Significance (MNES) must be referred to the DCCEEW to determine whether they are controlled actions and require approval from the Commonwealth Minister for the Environment. Under Part 3 of the EPBC Act, approval from the Minister is required for:

- an action that is likely to have a significant impact on MNES
- an action taken by any person on Commonwealth land (including Commonwealth leased land) that is likely to have a significant impact on the environment
- an action taken by any person outside of Commonwealth land (including Commonwealth leased land) that is likely to have a significant impact on the environment on Commonwealth land
- an action taken by a Commonwealth agency anywhere in the world that is likely to have a significant impact on the environment.

PON is not a Commonwealth agency, and a preliminary assessment of the project indicates no Commonwealth land would be affected.

There is potential for the project to have an impact on MNES due to the presence of the Green and Golden Bell Frog and potentially due to the projects proximity to the Ramsar Wetlands (see Section 6.2). A referral under the Commonwealth EPBC Act would be submitted to the DCCEEW. If determined to be a controlled action, then a bilateral assessment process would be requested for the project.

Matters of National Environmental Significance

A search of the EPBC Act Protected Matters Search Tool (PMST) for the project study area was conducted in July 2023 to identify potential MNES that may trigger the need for referral of the action to the DCCEEW. This has been supplemented by the results of a Preliminary Biodiversity Assessment (see Appendix A). A summary of the potential MNES within the project study area is presented in Table 4.4.

Table 4.4 MNES under the EPBC Act

MNES	Matters within the project study area
World heritage properties	Nil
National heritage places	Nil
Wetlands of international importance	Ramsar wetlands (Hunter Estuary Wetlands) adjacent to the site.
Commonwealth listed threatened species and ecological communities	Known population of the Green and Golden Bell Frog in the site and surrounds (using a 10 km buffer of the project site). The PMST EPBC Act Report identified seven listed threatened ecological communities with potential to occur within the project study area, 21 listed threatened flora species, 50 listed threatened fauna species, and 35 listed migratory species likely to be present within the project study area (10 km buffer). A Preliminary Biodiversity Assessment has been prepared and is summarised in Section 6.2 and provided in Appendix A.

MNES	Matters within the project study area
Commonwealth listed migratory species	There are 101 listed marine species within 10 km of the project site. Species such as whales and migratory marine species may be affected by dredging and sea dumping activities as a result of future stages of the project (if required).
Nuclear action	Nil
Commonwealth marine area	Nil
Great Barrier Reef Marine Park	Nil
Protection of water resources from coal seam gas development and large coal mining	Nil

4.2.5.2 Native Title Act 1993

The Australian Government *Native Title Act 1993* provides for the recognition of native title and establishes ways in which future dealings affecting native title may proceed, sets the standards for those dealings and establishes a mechanism for determining claims to native title.

Searches of the registers maintained by the National Native Title Tribunal in March 2023 indicate there are no native title claims or any indigenous land use agreements that apply to land within the area covered by this project.

5 Stakeholder and community engagement

This chapter outlines engagement carried out for the project and provides a summary of views of the community and other stakeholders. This chapter also outlines engagement that is proposed to be carried out for the project.

5.1 Introduction and context

PON is committed to building and maintaining trust with the community and stakeholders and recognises that these relationships are vital to its success as a business and the port as a valued asset. As such, engagement relating to this project has been an iterative process over the last two years that has sought to involve stakeholders and the community as PON diversifies to grow its export base and a clean energy future locally and internationally. In addition to engagement related to the project, regular engagement is also underway on the five-year review of the 'PON 2040 Masterplan', which would reference this project and the Port acting as an enabler for the new energy economy.

This Chapter outlines the strategies and actions taken since 2020 to involve and inform stakeholders and the community of PON's clean energy initiatives which has shifted and changed from the Green Hydrogen Hub to a Clean Energy Precinct, and how PON would build on this into the future. It provides an outline of the stakeholders, as well as the channels and activities that have and would continue to be used to communicate key milestones and development stages. Finally, it outlines some of the immediate and confirmed actions that are planned to continue engaging at the time of writing this report.

5.2 Engagement strategy

5.2.1 Engagement considerations, principles and strategy to date

In developing the Community and Stakeholder Engagement Strategy for this project, PON has been informed by NSW DPE's *Undertaking Engagement Guidelines for State Significant Projects* (last updated October 2022), particularly the concept of engaging at the earliest possible opportunity and providing clear and concise information that allows people to provide informed feedback.

The engagement approach also aligns with PON's *Stakeholder Engagement Framework* (November 2020). PON recognises the important role that stakeholders and the community play in achieving its vision to be a leading global trade gateway and a key driver for regional, state and national economies. By undertaking meaningful engagement with stakeholders and the community, PON can drive innovation, use feedback to inform decision-making, solve problems and enhance its social license to operate.

5.2.1.1 Strategy to date

Recognising that the Hunter region has a strong history and collective knowledge of the energy resources sector, a key component to PON engagement on this project has been to engage with stakeholders and the community at the early stages of development. The initial Green Hydrogen Hub concept provided opportunity for industry and community input at the feasibility stage. This engagement has been critical to informing the concept of the Clean Energy Precinct. This has also allowed PON to start an ongoing dialogue that:

- increases general awareness of energy diversification in the Newcastle and Hunter region, nationally and internationally
- increases awareness of the public and economic benefits and opportunities that can be realised across the project lifecycle
- begins to position stakeholders and the community with background knowledge that would ensure well-informed feedback is received in future phases, especially the formal exhibition period.

There have been three key phases to the Communications and Engagement Strategy to-date:

1. extensive local, regional, state and national coverage of the announcement of the concept of a Green Hydrogen Hub and subsequent feasibility study as it relates to commonwealth and state net zero policies and clean energy plans
2. reporting back to stakeholders on the outcomes of the feasibility study for the Green Hydrogen Hub and its impact on the advancement of a common user Clean Energy Precinct for all forms of energy and future fuel beyond hydrogen
3. undertaking engagement with new stakeholders for the project (currently underway).

PON has led an additional 24 consultation sessions to inform stakeholders of lodgement of the Clean Energy Precinct Scoping Report to the NSW DPE for the Clean Energy Precinct.

Stakeholders were informed that once fully constructed, the Precinct would facilitate clean energy production, storage, transmission, domestic distribution and international export using common user shared infrastructure. The first stage of the project would comprise the establishment of electrical infrastructure, water infrastructure and ancillary works, construction and workforce vehicle parking, construction laydown and stockpiles and construction of an ammonia storage facility.

Stakeholders were presented with the concept plans for the site and were taken through elements of the scoping report as it relates to Government agencies, departments, local councils and key neighbouring organisations proximate to the Kooragang Island Clean Energy Precinct were identified and a number of briefings held. These included:

- NCIG
- ARTC
- Transport for NSW
- SafeWork NSW
- EPANSW
- Port Waratah Coal Service
- National Parks and Wildlife
- Hunter Joint Organisation of Councils
- Port Stephens Council
- Newcastle City Council
- Lake Macquarie Council
- Port of Newcastle Community Liaison Group
- Port Authority of NSW.

In addition to those listed, two major media announcements and a dedicated industry briefing were held in May and July 2023 to inform industry and government stakeholders and the community of the Clean Energy Precinct concept plans and progress towards lodgement of the scoping report for development approval.

On 3 May 2023, PON hosted a Clean Energy Industry Briefing reaching an audience of 150 stakeholders. The briefing launched the Precinct concept plans including a significant media and Public Relations (PR) campaign to soft launch publicly the Clean Energy Precinct. This was made up of ten identified media opportunities across the month, which included the Stage 1 Concept Render media event at PON with deputy speaker and member for Newcastle, international event at the World Hydrogen Summit and Platform Zero Rotterdam Memorandum of Understanding signing, Chief Executive Officer and Clean Energy Precinct Project lead partnership trips to Korea and Japan. This media campaign secured 322 media articles or an average of 32 per media opportunity. Total reach of audience was 13.8-million people, with PON achieving an 86 per cent share of media voice across the market.

Media reach extended across all states and territories, to the United Kingdom, Greece, Japan, Singapore, USA, Netherlands, Russia and India.

On July 12 2023, PON hosted a Federal Ministerial media announcement with domestic and international parties. The Media event reached 439 million people. PON was mentioned 698 times with 82.5 per cent of news Australian based publications, and 17.5 per cent of news international.

Additional briefings were provided to the following stakeholders:

- Regional NSW
- Hunter Expert Panel, Royalties for Rejuvenation
- Training Services NSW
- Keolis Downer
- BP
- Snowy Hydro
- Jemena.

5.3 Stakeholders

PON has identified an extensive list of relevant key stakeholders who are affected by or have an interest or influence on the project. Table 5.1 provides an initial list of stakeholders who have been engaged to date. PON is maintaining a comprehensive Stakeholder List which currently contains 604 engaged stakeholders (as at 3 March 2023). This would be a primary database that would grow as the project develops and would be used as a central database for communications across stages.

Table 5.1 Key stakeholder groups for the project

Stakeholder group	Stakeholders
Government – Political representatives	**Federal** — Relevant Federal Members of Parliament — Ministers for Energy and Climate Change, Environment and Water — Relevant Assistant Ministers for Energy and Climate Change, Environment and Water — Relevant Shadow Ministers, and Shadow Assistant Ministers for Climate Change and Energy. **State** — NSW Minister for Energy — State Member for Newcastle — Parliamentary Secretary for the Hunter — Previous Shadow Treasurer. **Local** — Lord Mayor of Newcastle — Ward 1 Councillors of Newcastle City Council — Ward 4 Councillors of Newcastle City Council.
Government – Federal	— Australian Renewable Energy Agency — Department of Climate Change, Energy, the Environment and Water — Department of Foreign Affairs and Trade — Australian Rail Track Corporation — CSIRO.

Stakeholder group	Stakeholders
Government – State	— DPE — NSW Office of Energy and Climate Change — NSW Treasury (every 6 weeks relating to the handback of Kooragang Island Waste Emplacement Facility) — Department of Regional NSW — Port Authority NSW — Hunter and Central Coast Development Corporation (HCCDC) (every 6 weeks relating to the handback of Kooragang Island Waste Emplacement Facility) — NSW Energy Corporation — NSW Environment Protection Authority — Australian Maritime Safety Authority — NSW Chief Scientist and Engineer — Investment NSW — Transport for NSW.
Government – Local	— Newcastle City Council — Lake Macquarie Council — Hunter Region Joint Organisation of Councils (underway).
Government and business – International	Regular high-level representatives of various international government departments and agencies, visit PON alongside peak bodies and business associations relevant to future trade opportunity, investment attraction and existing bilateral arrangements. Recent examples include: — British High Commission — Singapore High Commission — Korea Gas Safety Corporation — Netherlands Innovation Network.
Industry organisations that can leverage industry and cluster networks to reduce overlaps, identify gaps to the development, deployment, and commercialisation of clean energy technologies	— Investment NSW North Asia — Regional Development Australia — Committee for the Hunter — Business Hunter Regional Infrastructure Committee — HunterNet — National Energy Resources Australia — NewH2 — HunteriF.
Education, skills and workforce organisations which represent a catalyst for partnerships and programmes that focus on building the critical skills for the hydrogen industry in the Hunter region through trainings including enhanced work integrated learning and postdoctoral programmes.	— University of Newcastle — Newcastle Institute for Energy and Resources — University of NSW (UNSW) — University of Technology Sydney (UTS) — CSIRO — TAFE NSW.

Stakeholder group	Stakeholders
Investment and capital providers that attract business and drive commercial aspects of innovation in the Hunter region	— 41 current and potential PON partners across manufacturing, energy resources, education, innovation, infrastructure, transport, investment (comprehensive list currently Commercial-in-confidence) **Utilities** — Ausgrid — Hunter Water — Transgrid. **Advocacy and networking groups** — Investment NSW North Asia — Regional Development Australia — Committee for the Hunter — Business Hunter Regional Infrastructure Committee — HunterNet — National Energy Resources Australia — NewH2 — HunteriF. **Other Ports** — Port of Rotterdam — Port of Antwerp — MAM Ports — Gladstone Port — Port of Jurong.
Community	— Neighbouring community — PON Community Liaison Group — Wider Newcastle and Hunter Region Community. **Traditional owners and Aboriginal groups** — Awabakal Local Aboriginal Land Council — Worimi Local Aboriginal Land Council — Guraki Aboriginal Advisory Committee (underway). **Local Interest Groups** — Stockton Community Action Group — Correct Planning and Consultation for Mayfield — Throsby Alliance — Pro-coal and anti-coal groups.

Stakeholder group	Stakeholders
Media	**Local** — The Newcastle Herald — Newcastle Weekly — ABC Newcastle — Radio- Triple M Newcastle, Hit106.9 Newcastle, 2HD, 2UE. **Regional** — Publications in the Lower and Upper Hunter, Mid North Coast, New England. **Industry** — Freight Tarde Alliance — Daily Cargo News. **Metro** — Australian Financial Review — Daily Telegraph — The Australian — Courier Mail — News.com — Sydney Morning Herald. **International** — AAP.

5.4 Communications materials, engagement channels and current reach

The following communications materials and engagement channels have been used to build knowledge about the project and allow an opportunity for consistent dialogue, should that be desired by stakeholders and the community. Early engagement has focussed on increasing awareness of the opportunities and benefits that energy diversification can bring to Newcastle and the Hunter region through PON, including its unique characteristics and benefits for Australia's diversified trade. Appropriate communication channels have been used to inform stakeholders of the shifts in the nature of the project.

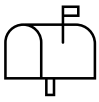
Project webpage

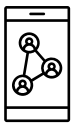
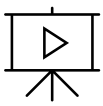
A dedicated page on the PON website would continue to be updated regularly to provide new information, as well as refined based on feedback from stakeholders. Visitors to the website are invited to join a mailing list for future updates. This website has been promoted through media releases, letters and briefings.

Number of visits to the Hydrogen Hub web page since publication (as at 4 November 2022 when it was transitioned to Clean Energy Precinct webpage): 7,238 page views with average time spent on page 4 minutes and 53 seconds

Number of visits to the Clean Energy Precinct web page (from 5 November 2022, statistics taken as at 28 March 2023): 2,619 page views with average time spent on page 3 minutes and 42 seconds

Number of subscribers to mailing list (as at 28 March 2023): 1706

	**Project email** A dedicated project inbox where stakeholders and the community can contact the Project Team with any questions. **Number of emails received to hydrogen@portofnewcastle.com.au (no longer project email now transition to Clean Energy Precinct has occurred, stats current as at 31 March 2023): 213** **Number of emails received to energy@portofnewcastle.com.au (as at 31 March 2023): 97**
	**Briefings** Regular briefings are provided to stakeholders in the table above including Government agencies and PON's Community Liaison Group, as well as follow-up presentation packs and materials. **Number of briefings conducted (as as at 27 March 2023): 79** Note included in this number are regular 6-weekly meetings with NSW Treasury and the HCCDC relating to the handback of KIWEF.
	**Letters and Emails** Personalised letters and emails were used to report back to stakeholders on the shift from Green Hydrogen Hub to Clean Energy Precinct. They would continue to be used in future stages to invite stakeholders to briefings and events, and to provide updates at key project milestones.
	**Networking events and presentations** Between October 2022 – February 2023, PON have used industry networking events to provide visibility of and information about the project. This includes: — Australian Hydrogen Forum – 100 attendees from national energy and gas companies, as well as State Ministerial representation from across Australia. — H2 Knowledge Exchange – 70 supply chain representatives from the Hunter Region — Presentation to the NSW Government Net Zero Industry Innovation Board — NSW Government Net Zero Update and HunterNet meeting – 200 industry stakeholders — PoN Industry Briefing – 160 representatives from national, state and regional Government, proponents and suppliers. — NewH2 Hunter Hydrogen and Energy Symposium — Invitees to the Port Industry Briefing were taken from PON's comprehensive stakeholder list which currently has 604 contacts on it (as at 3 March 2023). Where there were multiple representatives from one organisation on the list, invites were sent to just one representative.
	**Letterbox drop** A letterbox drop was used to communicate with residents in Carrington, Mayfield, Mayfield West and Tighes Hill regarding the Green Hydrogen Hub. Letterbox drops would be used in the future to invite the community to drop-in sessions.

	**Social media** PON currently utilise Facebook, Twitter, Instagram and LinkedIn to connect with stakeholders and the community through social media and to promote information about clean energy and the project. As at 29 March 2023: **Facebook followers: 826 Twitter followers: 353** **Instagram followers: 692** **LinkedIn Followers: 13,359**
	**Video** A short video introducing PON's intention to create opportunity for investment in clean energy and the potential benefits to stakeholders and the community. Note: this video would be updated in the next stage. **Number of views: 770** **Number of YouTube Subscribers: 381**
	**Media and paid advertising and editorials** Across major project milestones media releases and paid advertising have been used to secure reach of messaging to the broader community. Following the Clean Energy Precinct partnership announcement, the following media was achieved (12-28 July 2023) domestically and internationally: — PON achieving a total potential news reach of 515 million people — PON being mentioned 1003 times — 84.1 per cent of publications were Australian based, with 15.9 per cent international.
	**Site tours** Between 2021 and 2023 site tours have occurred at the Port. Site tours of note included the Prime Minister of the time, Scott Morrison MP and previous NSW Minister for Energy Matt Kean MP. **On average the Port has hosted 1-2 site tours per week.**

5.5 Feedback received from engagement

During the early feasibility project stages, engagement activities have largely focussed on industry and government stakeholders. Engagement to date has focused on the economic, social and environmental opportunity the project represents. Key areas of interest from industry and government include:

- potential for new industries in the Hunter region, particularly around the clean hydrogen and the potential for offshore windfarms
- job creation and leveraging the current workforce into new industries and capabilities
- opportunities for existing industry to provide services locally and expand their capability into new technology
- the relationship between the Clean Energy Precinct and the roll-out of NSW REZs
- opportunities for research and development and to showcase Hunter businesses as leaders in this field
- business and investment opportunities.

Nearby residents and the general community have been engaged through direct letters, social media, traditional media and briefings to the Community Liaison Group members (who are then expected to cascade information to their community).

Additionally, comments on public newspaper articles and social posts have been minimal with only one comment received at the time of writing which questioned the Government's investment and social shift towards clean energy sources, rather than the PON project specifically.

5.6 Engagement with Aboriginal representatives

PON exists within the traditional countries of the Awabakal and Worimi peoples. The port is committed to building strong ongoing relationships with the local First Nations communities. These relationships have been foundational to the development of PON's 'Reconciliation Action Plan', establishing a clear vision of what true reconciliation looks like for the PON. In 2021, PON engaged with internal and external stakeholders to develop a Diversity and Inclusion Strategy (the Strategy). The Strategy identified opportunities for the port to further support and engage with local First Nations communities which has informed PON's *Reconciliation Action Plan*.

This project provides an opportunity for PON to put commitments in the *2023 Reconciliation Action Plan* into action including:

- establishing and strengthen mutually beneficial relationships with Aboriginal and Torres Strait Islander stakeholders and organisations
- promoting reconciliation through PON's sphere of influence
- increasing understanding, value and recognition of Aboriginal and Torres Strait Islander cultures, histories, knowledge and rights through cultural learning.

As part of this project, the team have engaged an Indigenous Advisor from the Institute for Regional Futures that would be available to advise on this project. PON would leverage relevant networks through the Local Aboriginal Land Councils, the City of Newcastle's Guraki Aboriginal Advisory Committee and the University of Newcastle to engage further with local Aboriginal representatives.

5.7 Future engagement

PON recognises the importance of continued engagement with stakeholders and the community and are committed to providing opportunities for all parties to provide feedback throughout the planning and operation phases. PON acknowledges that, it is through this feedback, better outcomes can be realised.

Prior to lodging, PON is engaging regularly in key stakeholder briefings with an identified list of critical industry stakeholders. These include:

- port tenants and rail, transport and logistics providers (e.g. Australian Rail and Track Corporation, Port Waratah Coal Services, Newcastle Coal Infrastructure Group)
- regional hydrogen hub proponents (e.g. Orica, Energy Estate)
- key government departments and agencies (e.g. HCCDC, Safework NSW, NSW Port Authority, Transport for NSW
- utility providers (e.g. Ausgrid, Transgrid, Hunter Water)
- vocational and tertiary education providers (e.g. University of Newcastle, TAFENSW, Training Services NSW)

At the time of lodging this Scoping Report, PON also has the following future engagement activities confirmed, but not yet undertaken:

- a project briefing for members of the Hunter Region Joint Organisation of Councils
- a briefing for new members to the PON Community Liaison Group, noting current members who are reappointed and have previously received information would also be present

- a briefing to the EPA (as the Lead agency of the Environment Services Functional Area under the State Emergency Management Plan) and the Energy and Utility Management Unit in DPE (as the Coordinating Authority for the Energy and Utility Services Functional Area under the State Emergency Management Plan), noting the important role that these agencies play in preventing, preparing, responding and recovering from environmental hazards.

A comprehensive Communications and Stakeholder Engagement Strategy is currently being drafted that would outline the messages, activities and channels for future phases of the planning process including exhibition of the EIS, construction and operation. It is PON's intention to keep this Strategy live and to update it at regular milestones based on how stakeholders and the community indicate they would like to be consulted in the future and where future opportunities to provide information are identified.

As a first step towards this, PON is planning to incorporate an interactive component in the upcoming briefing of the PON Community Liaison Group to seek their input on future engagement channels and activities before the next iteration of the Communications and Stakeholder Engagement Strategy is finalised.

All feedback would be captured formally in a project Stakeholder Database.

6 Preliminary environmental assessment

This section considers key economic, environmental and social issues for the project requiring further assessment in the EIS and the level of assessment that should be undertaken for each issue.

6.1 Overview

A preliminary desktop environmental assessment has been carried out to identify potential economic, environmental and social issues associated with the proposed construction and operation of the project. Environmental issues are described in terms of sensitivity of the project study area and surrounds, scale and nature of likely impacts of the project and ability to avoid, minimise and/or offset these impacts. The significance of each issue and need for specialist assessment has been based on the potential environmental impact and likely level of community and stakeholder interest.

For each issue, the proposed scope and required level of assessment (detailed or standard) to be carried out as part of the EIS is identified, as well as the data requirements, investigations required, methodology for assessing impacts, applicable criteria and relevant government plans, policies and guidelines. The methods of assessment proposed in this report would be reviewed and confirmed upon receipt of the SEARs for the project. A summary of key issues and their proposed scope and level of assessment in the EIS is provided in the Scoping Summary Table (see Table 7.2).

6.2 Biodiversity

This section provides a summary of a preliminary desktop biodiversity assessment that has been prepared based on background database searches (provided in Appendix A). The report further identifies potential data gaps and seasonal survey requirements that would likely need to be addressed as part of the Biodiversity Development Assessment Report (BDAR) to inform the EIS.

The project site and a 10 km buffer around the project site (the study area) has been used for threatened flora and fauna searches consistent with the BioNet Atlas user manual (OEH, 2019) and standard practice for the Commonwealth PMST (DCCEEW, 2023d).

6.2.1 Existing environment

6.2.1.1 Native vegetation and threatened ecological communities

Native vegetation

The study area has been identified to contain Saline Wetlands vegetation formations from the Saltmarsh and Mangrove Swamps vegetation classes.

Threatened ecological communities – BC Act

The desktop assessment identified that the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions Threatened Ecological Communities (TECs) listed under the BC Act is likely to be present in the study area. This TEC corresponds directly to PCT 4097: Samphire Saltbush. The extent of PCT 4097: Samphire Saltbush and therefore the extent of Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions TEC is illustrated in Figure 6.1, although the occurrence may be more extensive than this. Other TEC's may also be present, and presence would be confirmed through future field validation.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.1
Plant Community Types

Legend

- Waterbody
- Road
- Railway
- Project Site

PCT (State Vegetation Mapping))

- PCT : 0, Not native vegetation
- PCT : 3083, Lower Hunter Tuckeroo Riparian Rainforest
- PCT : 4020, Coastal Creekflat Layered Grass-Sedge Swamp Forest
- PCT : 4028, Estuarine Swamp Oak Twig-rush Forest
- PCT : 4091, Grey Mangrove-River Mangrove Forest
- PCT : 4095, Paspalum vaginatum-Samphire Saltmarsh
- PCT : 4097, Samphire Saltmarsh
- PCT : 4103, Sporobolus virginicus Saltmarsh

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.2.1.2 Habitat suitability for threatened species – BC Act

Identification of threatened species for assessment

In the Biodiversity Assessment Method (BAM), threatened species are assessed as either ecosystem credit species, species credit species or a combination of the two (referred to as 'dual credit species'). The BAM defines these threatened species categories as follows:

- **ecosystem credit species** (predicted): are those threatened species where the likelihood of occurrence and/or elements of its habitat can be confidently predicted by vegetation surrogates and landscape features
- **species credit species** (candidate): are those threatened species that cannot be reliably predicted by habitat surrogates
- **dual credit species** are those threatened species where part of the habitat is assessed as an ecosystem credit (e.g. foraging habitat) and part as a species credit (e.g. breeding habitat). In this report, dual credit species would be included in both ecosystem and species credit assessment.

Ecosystem credit species

The results of likelihood of occurrence assessments identified 27 threatened ecosystem credit fauna species (including those that occur as dual credit species) that have a moderate or higher likelihood of occurrence within the study area. A summary of ecosystem fauna species likely to occur within the project study area is provided in Table 3.1 of Appendix A.

Species credit species

Candidate threatened flora species credit species generated from BAM-C and database searches

The results of likelihood of occurrence assessments identified that one threatened flora species has a moderate or higher likelihood of occurrence within the study area (see Appendix A for further detail). This species is *Zannichellia palustris* has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

Candidate threatened fauna species credit species generated from BAM-C and database searches

The likelihood of occurrence assessments identified 15 threatened fauna species credit species (including dual credit species) that have a moderate or higher likelihood of occurrence within the study area (see Appendix A for further detail). Of most concern is the Green and Golden Bell Frog that has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species. Potential habitat for Green and Golden Bell Frog is illustrated in Figure 6.2.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.2
Potential Green and Golden Bell Frog Habitat

Legend

- Project Site
- Road
- Railway
- Golden Bell Frog Habitat Areas

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.2.1.3 Matters of National Environmental Significance

Threatened ecological communities

Desktop assessment identified seven TECs listed under the EPBC Act with potential to occur within the study area. The PMST search results are provided in Appendix A. Of these TECs, Subtropical and Temperate Coastal Saltmarsh (listed as a Vulnerable ecological community under the EPBC Act), is likely to be present in the study area.

This TEC is likely to correspond directly to PCT 4097: Samphire Saltbush. The extent of PCT 4097: Samphire Saltbush and therefore the extent of this EPBC Act listed TEC is illustrated in Figure 6.1.

Threatened flora species

Database searches identified 21 threatened flora species listed under the EPBC Act that are predicted or known to occur within the study area (see Appendix A). The results of likelihood of occurrence assessments identified that one threatened flora species has a moderate or higher likelihood of occurrence within the study area, *Zannichellia palustris.* A summary of EPBC Act listed threatened flora species likely to occur within the study area is provided in Table 6.1. *Zannichellia palustris* has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

Threatened flora species records from BioNet are illustrated in Figure 6.3.

Table 6.1 Summary of EPBC listed threatened flora species with a moderate or higher likelihood of occurrence

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Zannichellia palustris	Zannichellia palustris	E	High – records for this species in the study area, surveyable when habitat conditions are favourable.

(1) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered.

Threatened fauna species

The PMST search identified 50 threatened fauna species, and two conservation dependent fauna species, listed under the EPBC Act, that are predicted or known to occur within the study area. The results of likelihood of occurrence assessments have identified 10 threatened fauna species to have a moderate or higher likelihood of occurrence within the study area. A summary of threatened fauna species likely to occur within the project study area is provided in Table 6.2.

As stated above, of most concern is the Green and Golden Bell Frog which has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

A map of threatened fauna species records from BioNet is illustrated in Figure 6.4.

Table 6.2 Summary of EPBC listed threatened fauna species with a moderate or higher likelihood of occurrence

Scientific name	Common name	EPBC Act[1]	Likelihood of occurrence
Amphibians			
Litoria aurea	Green and Golden Bell Frog	V	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
Birds			
Botaurus poiciloptilus	Australasian Bittern	V	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
Calidris canutus	Red Knot	E	High – records for this species in the study area, may occur when habitat conditions are favourable.
Calidris ferruginea	Curlew Sandpiper	E	High – records for this species in the study area, may occur when habitat conditions are favourable.
Calidris tenuirostris	Great Knot	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.
Charadrius leschenaultii	Greater Sand Plover	CE, M	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
Charadrius mongolus	Lesser Sand Plover	V, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
Limosa lapponica baueri	Nunivak Bar-tailed Godwit	E, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
Numenius madagascariensis	Eastern Curlew	V	High – records for this species in the study area, may occur when habitat conditions are favourable.
Rostratula australis	Australian Painted Snipe	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.

(1) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered; V = Vulnerable, M = Migratory

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.3
Threatened Flora Species Mapping

Legend

- Road
- Railway
- Project Site

Threatened Flora (BioNet Records)

- Zannichellia palustris

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.4
Threatened Fauna Species Mapping

Legend

- Road
- Railway
- Project Site

Threatened Species

- Eastern Coastal Free-tailed Bat
- Eastern False Pipistrelle
- Greater Broad-nosed Bat
- Green and Golden Bell Frog
- Grey-headed Flying-fox
- Large Bent-winged Bat
- Little Bent-winged Bat
- Southern Myotis
- Yellow-bellied Sheathtail-bat
- Australasian Bittern
- Black-necked Stork
- Black-tailed Godwit
- Curlew Sandpiper
- Eastern Osprey
- Little Eagle
- Magpie Goose
- Masked Owl
- Powerful Owl
- Spotted Harrier
- White-bellied Sea-Eagle
- White-fronted Chat

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

Migratory species

The PMST search results identified 77 listed migratory species from the 10 km search area. Habitats for 35 of these listed migratory species are likely to be present in the study area.

Listed marine species

The PMST returned 101 listed marine species from the 10 km search area. The study area is upstream from the marine environment and is connected to the Hunter River so impacts to listed marine species would be considered in the EIS.

Whales and other cetaceans

The PMST returned 12 whales and cetaceans from the 10 km search area. The study area is upstream from the marine environment and is connected to the Hunter River so impacts to whales and cetaceans would be considered in the EIS at a high level, although substantial impacts are unlikely.

Biologically important areas

Biologically important areas (BIA) of Regionally Significant Marine Species are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, foraging, resting or migration.

The PMST returned a list of seven biologically important areas within the study area. These include:

- *Ardenna grisea* (Sooty Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA
- *Ardenna pacifica* (Wedge-tailed Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA
- *Ardenna tenuirostris* (Short-tailed Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA
- *Tursiops aduncus* (Indo-Pacific/Spotted Bottlenose Dolphin) Breeding behaviour likely to occur. Study area is upstream from the mapped BIA
- *Tursiops aduncus* (Indo-Pacific/Spotted Bottlenose Dolphin) foraging behaviour known to occur. Study area is within the mapped BIA
- *Carcharias taurus* (Grey Nurse Shark) foraging behaviour known to occur. Study area is upstream from the mapped BIA
- *Megaptera novaeangliae* (Humpback Whale) foraging behaviour known to occur. Study area is upstream from the mapped BIA.

The study area is upstream from the marine environment and is connected to the Hunter River so impacts to these BIA would be considered in the EIS.

Wetlands of national and international importance

One Ramsar wetland or Wetland of International Importance was identified by the PMST which is the Hunter Estuary Wetlands. The study area is in the buffer zone of this Ramsar wetland.

Three Nationally Important Wetlands were identified by the PMST:

- Shortlands Wetland Centre – upstream from the study area
- Hexham Swamp – upstream from the study area
- Kooragang Nature Reserve – mapped within some areas of the study area.

6.2.1.4 Protected marine vegetation

The Saline Wetlands PCT 4097: Samphire Saltbush and PCT 4091: Grey Mangrove – River Mangrove Forest are classified as marine vegetation and have been identified within the study area.

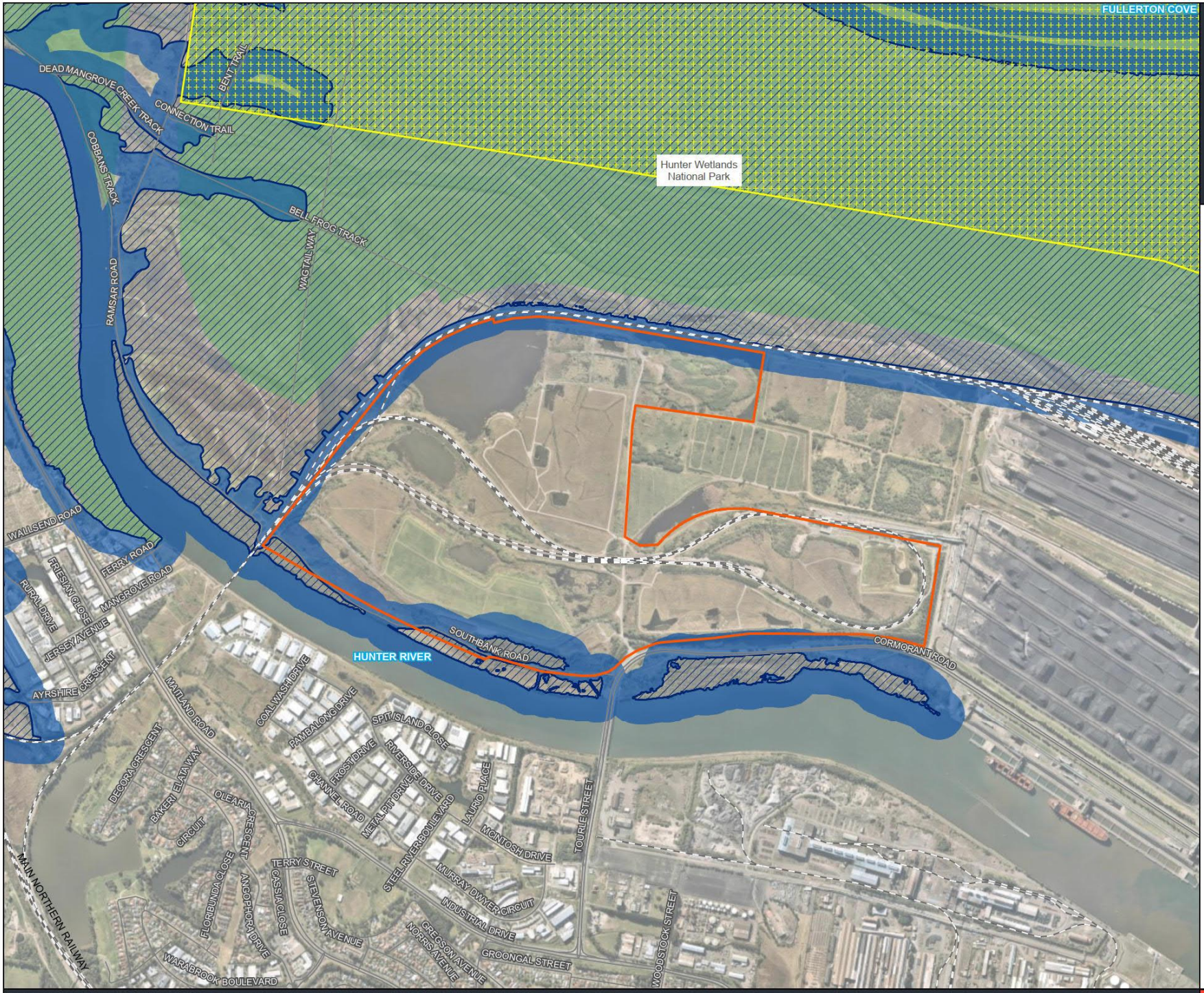
6.2.1.5 Key fish habitat

The study area contains mapped KFH along the Hunter River and associated wetlands.

6.2.1.6 Coastal wetlands

SEPP (Resilience and Hazards) 2021 provides an integrated policy for coastal assets. Under Chapter 2 of SEPP (Resilience and Hazards) 2021, areas of 'Coastal Wetlands' and 'Proximity Coastal Wetlands (100 metre buffer)' have been mapped across the state.

The study area contains areas of mapped 'Coastal Wetland' and 'Coastal Wetland Proximity Area' (Figure 6.5).



PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.5
Location of Proposal and Surrounding National Parks and Wetlands

Legend

- Road
- Railway
- Project Site
- Coastal Wetland
- Coastal Wetland Proximity Area
- Ramsar Wetland
- National Park

0 380 760 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:15,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.2.2 *Potential impacts*

As summarised above and detailed in Appendix A, a number of threatened native flora and fauna species, TECs, important habitat values and sensitive environments could potentially be impacted by the project.

Biodiversity values identified as known, predicted or considered likely to occur within the study area have been assigned to a three-tier biodiversity constraint hierarchy. The biodiversity constraints are shown in Figure 6.6.

This hierarchy has been developed to assist with addressing the principle of avoid and minimise as required under Section 7 of the BAM. The biodiversity constraints ranking has been based on the following criteria:

6.2.2.1 Tier 1 high biodiversity constraint – areas to avoid

Tier 1 biodiversity constraints are areas of very high environmental sensitivity. These areas should be avoided to display good stewardship of a sensitive area. Environmental approvals may be considered unlikely, unachievable, or would add complexity and delay to approvals. Tier 1 constraints are:

- mapped Coastal Wetlands
- mapped Nationally Important Wetland Kooragang Nature Reserve
- Key Fish Habitat
- Protected Marine vegetation including Saltmarsh and Mangroves
- habitat for the BC Act and EPBC Act listed Green and Golden Bell Frog.

The Tier 1 high biodiversity constraint areas should be identified for retention and the various components of the project designed around these features.

6.2.2.2 Tier 2 moderate biodiversity constraint – areas where impacts should be minimised

Tier 2 biodiversity constraints are areas of moderate environmental sensitivity. Impact to these areas should be minimised. Environmental approvals are still considered complex and would result in triggers for biodiversity offsets and demonstration of avoid and minimising impacts on such biodiversity values. Tier 2 biodiversity constraints include:

- BC Act listed Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC
- EPBC Act listed Subtropical and Temperate Coastal Saltmarsh TEC
- known habitat for the BC Act and EPBC Act listed threatened wetland plant *Zannichellia palustris*
- habitat for the BC Act and EPBC Act listed wetland bird species
- habitat for EPBC Act listed migratory species
- biologically important areas of Regionally Significant Marine Species
- habitat for whales and cetaceans.

The Tier 2 Moderate biodiversity constraint areas should be considered for retention where possible.

6.2.2.3 Tier 3 low biodiversity constraint – areas to target development

Tier 3 low biodiversity constraints are the disturbed parts of the study area that generally lack native vegetation or habitats. Tier 3 biodiversity constraints are:

- disturbed areas with none or minimal native vegetation or habitats for threatened species.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6.6
Biodiversity Constraints in the Study Area

Legend

- Road
- Railway
- Project Site

Biodiversity Constrant Rating

- Tier 1
- Tier 2
- Tier 3

0 250 500 Meters

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:10,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.2.3 *Proposed investigations and assessment*

6.2.3.1 Native vegetation assessment

Detailed native vegetation survey and mapping would be required in accordance with Section 5 of the BAM and Commonwealth requirements. This would include stratifying vegetation types and broad condition states to define vegetation zones, that would be sampled using vegetation integrity survey plots in accordance with Section 4 of the BAM. These native vegetation surveys would determine the vegetation integrity scores for each vegetation zone that would be utilised in the BAM Credit Calculator and inform impacts and potential biodiversity offset requirements.

The native vegetation survey and mapping would identify and refine presence and extent of the BC Act listed Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions TEC and the EPBC Act listed Subtropical and Temperate Coastal Saltmarsh TEC.

The extent of protected marine vegetation in the form of saltmarsh and mangroves would also be determined.

6.2.3.2 Targeted threatened species surveys

Threatened flora and fauna surveys would be required for species credit species listed under the BAM within the study area. Targeted surveys would also occur with due consideration of state and Commonwealth survey requirements.

Targeted threatened species surveys are recommended for the following species:

- threatened wetland plant *Zannichellia palustris*
- Green and Golden Bell Frog
- wetland bird species including Australasian Bittern, Australian Painted Snipe, Eastern Curlew, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Lesser Sand Plover, Pied Oystercatcher, Broad-billed Sandpiper, Bar-tailed Godwit (including Nunivak Bar-tailed Godwit), Black-tailed Godwit, and Terek Sandpiper
- raptors including White-bellied Sea Eagle, Little Eagle and Eastern Osprey
- Southern Myotis.

A BDAR would be prepared as part of the EIS, that would further identify and clarify potential significance of biodiversity impacts associated with the project. The BDAR would be prepared in accordance with the BC Act and BAM. Targeted detailed threatened species seasonal survey would occur to ensure compliance with the BAM along with vegetation integrity plot based native vegetation surveys. The biodiversity constraints identified in this report provide a starting point to consider avoidance and minimisation of biodiversity impacts.

A referral under the EPBC Act to the Commonwealth would be required.

6.3 Aboriginal heritage

This section presents a summary of the preliminary Aboriginal heritage assessment that has been prepared for the Scoping Report (Appendix B).

6.3.1 Existing environment

The study area is within the Awabakal Local Aboriginal Land Council. Aboriginal occupation and use of the Island occurred for many years prior to European settlers, and was used for hunting, fishing and gathering activities by the Awabakal and the Worimi people (Dorey n.d.). While today it is within the Awabakal Local Aboriginal Land Council boundary and is south of the Worimi Local Aboriginal Land Council, its shared status as a meeting point between Awabakal and Worimi peoples is acknowledged by both Local Aboriginal Land Councils and City of Newcastle (City of Newcastle, 2018).

The study area is within the Hunter subregion of the Sydney Basin bioregion. The subregion is generally comprised of rolling hills and wide valleys with a meandering river system on a wide flood plain. Typical soils comprise a variety of harsh texture contrast soils and deep sandy loam alluvium.

Aboriginal sites recorded in NSW are registered with geographic co-ordinates in the Aboriginal Heritage Information Management System (AHIMS) and are protected under the *National Parks and Wildlife Act 1974*. Information in AHIMS can provide information on Aboriginal site patterning as well as showing if Aboriginal sites occur in the study area.

An AHIMS search was completed on 1 March 2023 from 376328.0 – 386328.0 (Eastings) to 6357381.0 (Northings). The search produced a result of 52 sites (see Appendix B) most of which are located south of the project site. The sites comprise mainly surface artefacts (isolated finds or artefacts scatters) that are generally distributed along water courses, or beside wetlands, with a few also associated with middens. Some have been subject to an Aboriginal Heritage Impact Permit (AHIP) and thus have been removed, but the majority remain valid.

6.3.2 Potential impacts

There are no AHIMS sites within the project site, with the closest site AHIM 38-4-0041 located 20 metres southeast of the project site and comprising surface artefacts. There is likely more examples of tangible Aboriginal heritage in the area, although much has been disturbed or covered over during land reclamation activities. The historical evidence as well as oral histories identify that there are many other values associated with the study area including camping, hunting, gathering, links to ceremonial areas, shared territory as well as a darker post-contact history including massacres of Aboriginal people.

6.3.3 Proposed investigations and assessment

An assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010) would be prepared as part of the EIS. Consultation would occur with Aboriginal communities, having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a).

6.4 Non-Aboriginal heritage

This section presents a summary of the preliminary non-Aboriginal heritage assessment that has been prepared for the Scoping Report (Appendix B).

6.4.1 Existing environment

Exploration and settlement of Newcastle and surrounds by early Europeans occurred during the early 1800s. With an initial focus on exploiting resources, early Europeans brought forestry and mining activities to the region, such as cedar and coal (City of Newcastle, 2018). These early activities, in particular coal mining, were inefficient until installation of railways in the 1850s. From this time, Newcastle's coalfield became the "powerhouse of the Australian colonies". In 1915, World War I hampered coal exports; however, the opening of BHP Steelworks transformed Newcastle and shaped the industrial nature of Newcastle today, as Australia's industrial capital (City of Newcastle, 2018).

The study area is known historically as Ash Island that was surrounded by a number of other islands (Upper Mosheto Island, Mosheto Island, and Dempsey Island) before they were all joined to create Kooragang Island. Being estuary islands, Ash Island, along with the others, were a rich hunting area and food resources included shell fish and fish (particularly mullet and a fish resembling herring) (Grant, 1803). The Island is rich in birdlife including Wonga Wonga pigeons and other fauna included kangaroos, possums, flying foxes, snakes and goannas (Newcastle Morning Herald, 1993). It was also home to extremely lofty fig trees.

The local landscape has also been substantially modified by the joining of Ash Island, Upper Mosheto Island, Mosheto Island, and Dempsey Island to become Kooragang Island.

6.4.1.1 Historic heritage

Heritage registers including the World Heritage List, National Heritage List, State Heritage Register and the Newcastle LEP were searched, and no heritage items were found to occur within the project site.

The closest heritage item is the Former Migrant Camp (I-291) 690 metres to southwest of the project site, followed by the Remnant Garden (I-692) 750 metres south of the project site, both are of local significance and are listed on the Newcastle LEP (Table 6.3, Figure 6.7). Items relating to the Sandgate Cemetery are located 900 metres to 1,385 metres to the west of the project site and are also locally listed. State Heritage Register listings are over 2.5 km from the project site and the closest Commonwealth heritage listings are 4.5 km and 12 km away (Table 6.3, Figure 6.7).

In addition, the Coal River Precinct at Nobbys Rd, Newcastle East (ID 106231) located approximately 6.5 km southeast of the project site has been nominated as a national heritage place, however is not registered. As such, it is not regarded as a heritage item, but may be registered in future and thus may be relevant for future assessments.

Table 6.3 Heritage listings within or near the project site

Listing type	Item	Significance	Spatial relation to project site
Newcastle LEP	Former Migrant Camp (I-291)	Local	690 metres southwest
Newcastle LEP	Remnant Garden (I-692)	Local	750 metres south
Newcastle LEP	Sandgate Cemetery (I-516)	Local	900 metres west
Newcastle LEP	Sandgate Cemetery Railway Spur (I-517)	Local	1385 metres west
State Heritage Register	131 Radar Station (former) (01815)	State	2.5 km northwest
State Heritage Register	Tomago House & Tomago Chapel (00207)	State	3.5 km north
Commonwealth	Fort Wallace (105335)	National	4.5 km east
Commonwealth	Williamtown RAAF Base Group (105639)	National	12 km northeast

6.4.2 Potential impacts

With respect to non-Indigenous heritage, there are no Commonwealth heritage places in the project site with the closest being over 4 km east of the project site (Fort Wallace – 105335). There are no state significant or locally significant heritage items in the project site, with the closest State Heritage Register item being approximately 2.5 km northwest of the site (131 Radar Station [former] 01815) and the closest local heritage item 690 metres southwest of the site (Former Migrant Camp I-291).

6.4.3 Proposed investigations and assessment

As outlined in Section 6.4.1, the preliminary desktop assessment of non-Aboriginal heritage has shown that there are no non-Aboriginal heritage items or places within the project site listed on the statutory and non-statutory heritage registers. The nearest registered non-Aboriginal heritage item were the Former migrant camp and the Remnant Garden, that are listed as having local significance and located approximately 690 metres and 750 metres respectively from the project site.

Due to the extensive ground disturbance from the former land use and remediation of the site, it is considered that non-Aboriginal heritage items are unlikely to be recovered. A desktop due diligence assessment for non-Aboriginal heritage would occur as part of the EIS.

PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6-7
Non-Aboriginal Heritage Surrounding the Project Area

Legend

- Road
- Railway
- Watercourse
- Project Site
- Commonwealth Heritage Listings
- Newcastle LEP 2012
- State Heritage Listings
- State Heritage Listings (National Heritage nom)

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:50,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.5 Land use and property

6.5.1 Existing environment

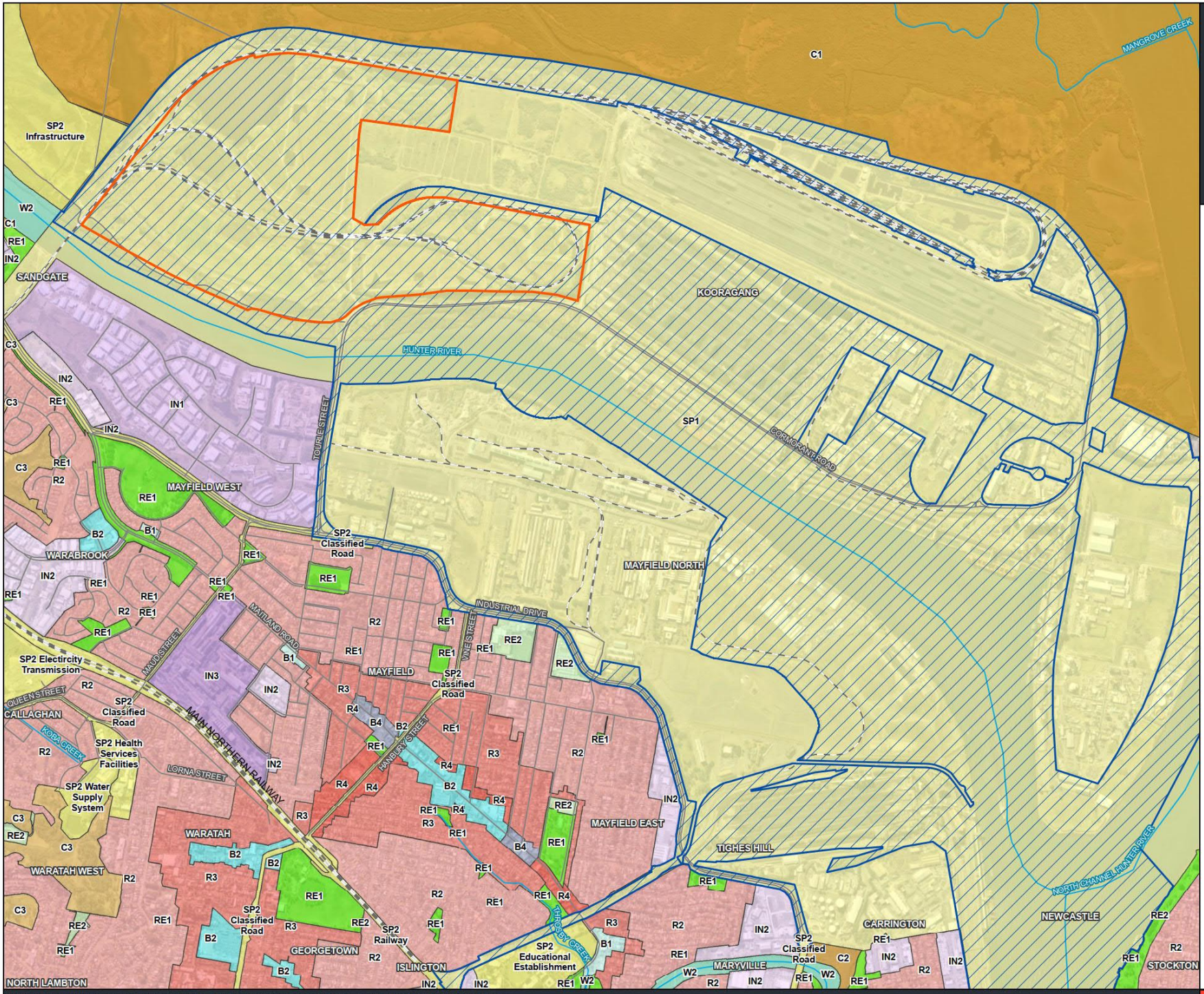
The project site and surrounds are zoned SP1 Special Activities and is the former KIWEF site, that forms part of PON. The area is predominantly used for industrial and port-related activities. The project site was a former waste emplacement facility operated by BHP. The site has been capped and remediated by the NSW Government and would be returned to the management of PON during 2023.

A preliminary review of the Soil and Land Capability Mapping data for the project site found that the soils on the site are not assessed. Likewise, a review of Biophysical Strategic Agricultural Land (BSAL) data showed that there are no areas of BSAL mapped within or in the vicinity of the project site.

The PON currently manages Newcastle Port under a 98 year lease from the NSW Government that commenced on May 2014 (PON, 2022). Crown land is mapped for the Hunter River South Channel that is directly south of the project site. Table 6.4 and Figure 6.8 outlines key land uses and land zoning within and surrounding the project study area.

Table 6.4 Key land uses within and surrounding the project study area

Key land uses	Relevance to project study area
Port of Newcastle	The project site and surrounds predominantly comprise shipping and port operations.
Transport infrastructure	The project site is located on the KIWEF site at the Port of Newcastle and is accessed via Industrial Drive, Tourle Street and Cormorant Road.
Electrical infrastructure	The project site would be located within the Hunter Central-Coast REZ. The project would involve construction of electrical infrastructure including grid connection, transmission infrastructure and associated easements and corridors, substation and switchyard.
Heavy industry	Ammonia and hydrogen production and storage is proposed in the Clean Energy Precinct.
Protected environments	The Hunter Wetlands National Park (Ramsar Wetlands) are located to the north of the project site. Green and Golden Bell Frog habitat is located within and surrounding the project site.
Rivers and waterways	The study area is upstream from the marine environment and is connected to the Hunter River that is mapped as KFH.



PON Clean Energy Precinct Concept Plan Scoping Report

Figure 6-8
Land Zoning

Legend

- Road
- Railway
- Watercourse
- Project Site
- Port of Newcastle Lease Area

Land Zoning

- B1 Neighbourhood Centre
- B2 Local Centre
- B4 Mixed Use
- C1 National Parks and Nature Reserves
- C2 Environmental Conservation
- C3 Environmental Management
- IN1 General Industrial
- IN2 Light Industrial
- IN3 Heavy Industrial
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP1 Special Activities
- SP2 Infrastructure
- W2 Recreational Waterways

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:20,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.5.2 *Potential impacts*

6.5.2.1 Construction

The Concept Plan is being refined through input from specialists and ongoing consultation with stakeholders. The proposed final Concept Plan and footprints of permanent and temporary structures developed as part of the project would be confirmed and assessed as part of the EIS.

During construction, the project has potential for temporary land use and property impacts including:

- delays or interruptions to surrounding roads and traffic
- potential temporary lease of land for construction compounds, parking etc.
- temporary potential disruption to nearby properties
- potential amenity impacts including noise, vibration and air quality
- soil and water management, including potential disturbance of the cap.

6.5.2.2 Operation

Operation of the project would result in a permanent change in land use from former waste landfill/emplacement to heavy industry. The project would support storage of clean energy and approval of the Concept Plan would provide renewable energy providers with some certainty on likely future development of the area.

6.5.3 *Proposed investigations and assessment*

A property and land use impact assessment would be undertaken for the EIS that would:

- describe the existing environment, including existing land use and zoning, land capability, Crown land presence, infrastructure easements and ownership patterns
- consider property details, including land zoning and current use
- assess potential construction and operational impacts and recommend relevant mitigation measures.

PON would continue to consult with neighbouring landowners during further planning and design development to avoid or minimise impacts on adjacent land uses and property.

6.6 Landscape character and visual amenity

6.6.1 *Existing environment*

The Clean Energy Precinct would be developed within an existing port environment that contains port and industrial activities. Existing rail lines, local roads and port related infrastructure are located on the site. Furthermore, the site has been heavily disturbed by its former land uses. Numerous activities are located east of the project site with environmental zoned land to the north and west and residential land uses to the south across the Hunter River. However, views to the site are generally obstructed by existing vegetation.

6.6.2 *Potential impacts*

6.6.2.1 Construction

Construction of the project would temporarily alter the visual environment during various activities including earthworks, movement of plant and material and construction of buildings and infrastructure. Temporary construction buildings, stockpile and laydown and parking areas would temporarily affect the visual environment. Where practicable, construction would be staged to limit areas of exposed soil, and this would also reduce the extent of construction activity.

6.6.2.2 Operation

Operation of the project would have a long-term impact on the landscape character and visual amenity.

Buildings would be designed to consider the existing visual environment through both practicality as a heavy industrial activity and principles that consider the location near wetlands and Green and Golden Bell Frog habitat. Infrastructure, including electrical, water and roads, would be designed to appropriate standards with appropriate consideration of the role and function of the Clean Energy Precinct.

6.6.3 Proposed investigations and assessment

A detailed Landscape Character and Visual Impact Assessment would be prepared as part of the EIS to identify potential visibility of the project from different viewpoints along the corridor. This assessment would identify and describe potential sensitive receivers and landscape character areas and unique qualities, consider heritage and other social values, and consider the impacts on the landscape character and views during construction and operation during the day and night.

The assessment of landscape character and visual amenity impacts would include:

- prepare viewpoint inventory, assess representative viewpoints (private and public domain) including visual influence zone, impacts during the day, night, construction and operation
- identify visual performance objectives and assessment of the project against each objective
- assess broader landscape impacts
- identify mitigation and management options.

6.7 Social

This section presents a summary of the Social Impact Assessment that has been prepared for the Scoping Report (Appendix C).

The social locality is the geographical area in which direct and indirect impacts (positive and negative) are likely to occur. The social locality has been determined by considering stakeholders most likely to experience direct and indirect socio-economic impacts, and their geographic location.

The social locality considers Australian Bureau of Statistics (ABS) statistical geography boundaries, including ABS Suburbs and Localities (SALs), and Urban Centres and Localities (UCLs) that intercept and surround the project.

6.7.1 Existing environment

Several residential suburbs surround the project site including Tighes Hill, Carrington, Mayfield and Mayfield East situated approximately 1.5–2 km south of the project site across the Hunter River. The suburb of Stockton is approximately 5 km east of the project site. The social locality consists of:

- Newcastle Statistical Area Level 3 (SAL3) (referred in this report as Newcastle), which includes the following suburbs within approximately 5 km of the project site: Warabrook, Sandgate, Mayfield West, Mayfield North, Mayfield East, Mayfield, Tighes Hill, Maryville, Islington, Hamilton North, Carrington, Georgetown, Waratah, Waratah West, Callaghan and North Lambton.
- Tomago Urban Centre and Localities (UCL) (referred in this report as Tomago), which includes a section of the Hunter Wetlands to the north of the project.

6.7.1.1 Demographic overview

The demographics for the sparsely populated Tomago differ greatly from Newcastle across several indicators. Given the small resident population of Tomago (269 people), the suburb represents around 0.1 per cent of the social locality's population, and consequently has minor impact on the overall demographic breakdown of the region.

The social locality has a total resident population of 179,269 people. The median weekly household income of $1,740 is similar to the state median of $1,746, while the unemployment rate of 4.9 per cent is slightly lower than the state rate.

Although the social locality has a relatively greater proportion of Aboriginal and Torres Strait Islander residents (4.6 per cent in Newcastle and 8.9 per cent in Tomago, as against 3.4 per cent in NSW), it is generally less culturally and linguistically diverse than both NSW and Australia. Only 12.1 per cent of households in Newcastle and 4.7 per cent in Tomago speak a language other than English at home. This contrasts with 29.5 per cent of households at state level speaking a language other than English at home. Mandarin and Macedonian are the top languages other than English spoken in Newcastle, whilst in Tomago, 1.9 per cent of households speak Thai.

6.7.1.2 Education

Educational attainment in Newcastle is proportional with the attainment rates for NSW more generally and is marginally lower in relation to the proportion of people with a Bachelor degree level and above (27.7 per cent as against the state rate of 27.8 per cent), as well as for those with a Certificate Level IV and III. Tomago however has a significantly lower rate of residents with a Bachelor degree level and above, at 3.2 per cent.

6.7.1.3 Health

People in the social locality suffer from higher rates of long-term health conditions than those in NSW more generally. Only 55.9 per cent of people in the Newcastle SAL and 36.1 per cent of people in Tomago report having no long-term health conditions, compared to 61 per cent across the state. Mental health conditions are particularly prevalent, with 12.4 per cent of people suffering from a mental health condition in Newcastle. In Tomago, asthma is one of the most prevalent conditions.

6.7.1.4 Economy

Key employment industries and occupations

Newcastle is famous for its coal and steel industries, and PON is the largest coal exporting port in the world, exporting 159.9 million tonnes of coal in 2017 (PON, 2022).

However, the top occupations in the social locality highlight its reputation as an economy based on heavy industries including coal and steel. With the closure of the BHP steelworks in 1999, after 84 years of operation, Newcastle experienced a significant amount of economic diversification that has strengthened the local economy. Professionals make up 28.7 per cent of the workforce in Newcastle, followed by community and personal service workers at 13.4 per cent. The proportion of professionals and community service workers is higher than both the state and national rates.

Neither the coal industry nor any of the industries associated with its production and transport appear in the list of top industries for Newcastle. Tomago has a high proportion of residents (9.9 per cent) working in the road transport industry.

Port of Newcastle activities

While PON activities are not reflected in the top industries and occupations for Newcastle SA3, its operation is nevertheless integral to the economic life and future of the region. PON operates within an industrial precinct surrounded predominantly by other businesses complementary to port operations.

PON currently operates 20 berths and has total land holdings of 792 hectares, including 200 hectares of vacant PON land (PON, 2022). The port currently handles 4,697 ship movements and 166 million tonnes of cargo annually, and with a deep-water shipping channel operating at 50 per cent of its capacity, significant port land available and access to national rail and road infrastructure.

6.7.2 *Potential impacts*

Table 6.5 identifies the project activities that would likely result in socio-economic benefits during construction and operation, the extent of the benefit and level of assessment required.

Table 6.5 Scoping of potential social benefits

Primary impact category	Project activity	Potential impacts on people	Who is likely to benefit	Phase	Level of assessment
Livelihoods	Construction and operation of the Clean Energy Precinct	Enhanced livelihoods resulting from employment opportunities	Newcastle and Hunter Valley workforce	Construction and operation	Detailed
Livelihoods	Construction and operation of the Clean Energy Precinct	Positive direct and indirect economic opportunities for local and regional businesses	Businesses in Newcastle and Hunter Valley	Construction and operation	Detailed

Table 6.6 identifies the project activities that would likely result in socio-economic impacts during construction and operation, their extent and level of assessment required.

Table 6.6 Scoping of potential social impacts

Primary impact category	Project activity	Potential impacts on people	Who is likely to benefit	Phase	Level of assessment
Way of life	Transport of workers and materials to and from the project site	Increased traffic impacting how people experience their daily routines, travel and sense of road safety	Commuters and other road users	Construction and operation	Standard
Health and wellbeing	Storage of ammonia	Anxiety and stress due to risks associated with ammonia storage, such as exposure to gas, odour and respiratory injuries	People who work and live within an exposure radius	Operation	Detailed
Health and wellbeing	Storage of ammonia	Cumulative exposure risks causing hazards for workers and nearby residents	People who work and live within an exposure radius	Operation	Detailed
Culture	Construction and operation activities which occur on or close proximity to wetlands and/or impact threatened species	Diminished environmental values	Local residents who value the wetlands and their unique flora and fauna	Construction and operation	Detailed

Primary impact category	Project activity	Potential impacts on people	Who is likely to benefit	Phase	Level of assessment
Culture	Construction and operation activities which occur on or close proximity to wetlands and/or impact threatened species	Diminished Aboriginal cultural values	Worimi and Awabakal Aboriginal communities	Construction and operation	Detailed
Surroundings	Construction and operation of the Clean Energy Precinct	Diminished aesthetic values due to the construction of new infrastructure	Local residents and visitors within eyesight of the project	Construction and operation	Detailed
Decision Making	Project approvals	Diminished sense of control over aspects that may impact people's lives	Local residents and Aboriginal groups within the social locality	Pre-construction	Detailed

6.7.3 *Proposed investigations and assessment*

To further understand magnitude and likelihood of impacts and benefits identified in the preliminary SIA assessment, a complex Phase 2 SIA would be required in accordance with the *Social Impact Assessment Guideline* (DPE, 2023b).

The key objectives of the SIA Phase 2 report would be to:

- predict and analyse the extent and nature of likely social impacts against baseline conditions using accepted social science methods
- evaluate, draw attention to and prioritise the social impacts that are important to people
- develop appropriate and justified responses (e.g., avoidance, mitigation and enhancement measures) to social impacts, and identify and explain residual social impacts
- propose arrangements to monitor and manage residual social impacts, including unanticipated impacts, over the life of the project (DPE, 2023b).

6.8 Economic

6.8.1 *Existing environment*

The project site is within the Newcastle and Lake Macquarie region. The main industries of employment at the 2021 Census for the region included (ABS, 2021):

- professionals (24.9 per cent)
- technicians and trades workers (14.1 per cent)
- community and personal service workers (13.3 per cent)
- clerical and administrative workers (12.4 per cent)
- managers (11.1 per cent)
- labourers (8.6 per cent)
- sales workers (8.4 per cent)
- machinery operators and drivers (5.8 per cent).

6.8.2 Potential impacts

6.8.2.1 Construction

As a result of the project, PON has advised significant expenditure (approximately $850 million capital investment value) would be spent within the local, regional and NSW economies during the construction phase over a relatively short period of time. The construction phase for enabling works and future stages of development would also generate opportunities for local employment and suppliers, that would benefit the economy. PON has also advised that the project would generate over 5,261 jobs during construction of all stages of the Clean Energy Precinct.

Substantive negative impacts to local businesses are unlikely as a result of the project, given the isolated location of the project. Availability of short-term accommodation to support the required workforce could be limited and would be considered during preparation of the EIS.

6.8.2.2 Operation

When fully completed, the project would facilitate a source of reliable renewable energy supply with associated economic benefits to consumers across the NEM including:

- contribute to growing clean energy demand in NSW
- reduce GHG emissions and reliance on coal powered energy
- contribute to NSW and Commonwealth renewable energy targets
- construction and operation employment opportunities in regional areas
- help achieve economies of scale for low-cost, clean and reliable electricity
- community and stakeholder engagement
- sustainable renewable energy development
- minimise potential adverse impacts on the environment
- support investment in the Hunter-Central Coast REZ.

Other economic activities close to the project, such as tourism and recreational activities, may be affected from changes to amenity, such as visual presence of energy transmission infrastructure and increase in export vessels.

6.8.3 Proposed investigations and assessment

A detailed economic impact assessment would be undertaken for the project to identify and quantify potential economic impacts of the project including:

- employment and value added to the state economy during both construction phase and on an ongoing operation basis
- spending of workers directed to local businesses
- council rates revenue
- electricity supply benefits
- environmental benefits of GHG emission reduction.

6.9 Hydrology, flooding and water quality

6.9.1 Existing environment

6.9.1.1 Surface water, hydrology and water quality

The project study area is located within the Hunter River surface water catchment (see Figure 6.9) and the Hunter Estuary, that comprises over 100 km of waterways, including the South Arm of the Hunter River (DPE, 2022). The *Hunter unregulated and alluvial water sharing plan 2022* (draft) is in place for this catchment.

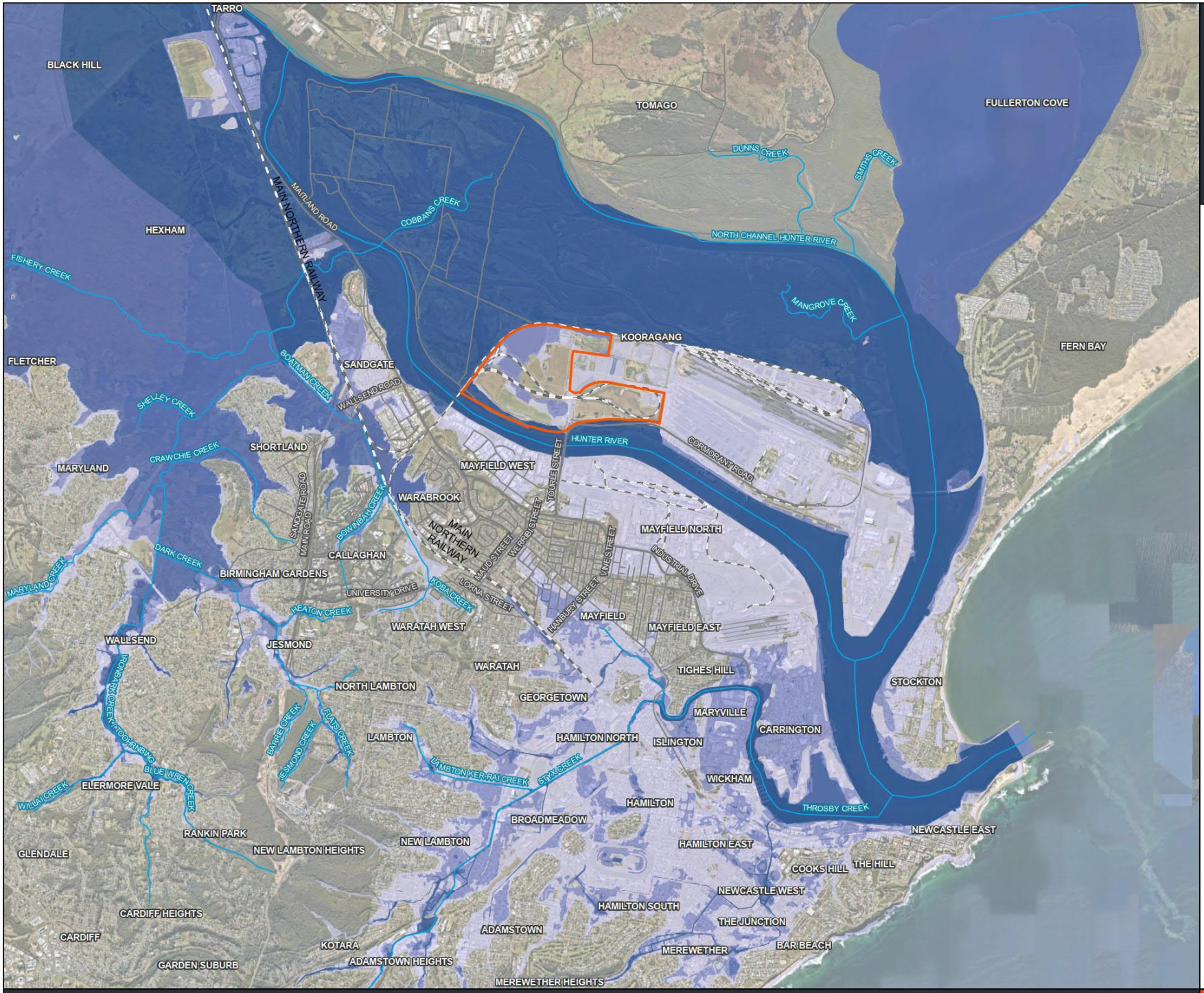
The project site is bounded by the Hunter River South Channel (to the south), coastal wetlands (to the north) and Ramsar wetlands (to the north and west), as shown in Figure 6.9. Although adjacent to the Hunter River, the project site does not intersect the river. There is one lake in the western edge of the project site (see Figure 6.9).

Existing water quality within the project site is expected to be influenced by surrounding land uses, such as existing port operations that may have resulted in increased pollutants (from coal exports) and sedimentation within nearby waterways. The Hunter Estuary has been substantially modified by industrial activity and land use changes with resulting impacts on water quality and habitat integrity.

As discussed in Section 6.2.1.5, KFH is present near the project site.

6.9.1.2 Flooding

Flood risk mapping was provided by the NSW ePlanning Spatial Viewer. A small portion of the project site adjacent to the Hunter River is mapped as high flood risk (DPE, 2023c).



wsp

PON Clean Energy Precinct
Concept Plan Scoping Report

Figure 6-9
Hydrology and Flooding Surrounding the Project Area

Legend

- Road
- Railway
- Watercourse
- Project Site

Flood Risk

- High Risk
- Medium Risk
- Low Risk
- Residual Risk

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

1:50,000 Date: 9/06/2023

Data sources: - NSWSS, EPI, PON, Nearmap, Geoscience Australia

6.9.2 Potential impacts

6.9.2.1 Construction

There is potential for erosion and sedimentation resulting from construction works such as earthworks and excavations for foundations, road infrastructure and stormwater drainage.

Potential impacts on water quality could occur during construction due to:

- sedimentation of soil material eroded during ground disturbance, vegetation removal and storm events
- leaks and spills of fuels, chemicals or wastewater impacting surface water or groundwater quality
- changes to surface water flow patterns due to the location of earthworks, flow diversions, bunding, material stockpiles and temporary drainage infrastructure
- temporary dewatering of excavations.

Sedimentation, if uncontrolled, would have potential to increase turbidity and result in a decline in water quality of the Hunter River and adjoining wetlands. If not managed appropriately, introduction of pollutants during leaks and spills could result in changes to the pH, electrical conductivity, dissolved oxygen and temperature of water; reduced light penetration due to increased turbidity; increased sediment load, organic matter and turbidity of water, increase in gross pollutants and introduction of toxic pollutants such as construction fuels, oils and grease and chemicals.

6.9.2.2 Operation

Potential impacts related to surface water and hydrology during operation are most likely to be associated with:

- changes to local hydrology, including the quality, quantity and patterns of surface water runoff and drainage, associated with an increase in non-permeable surfaces due to site establishment works
- transport and deposition of sediment from ground disturbance as well as vehicle and equipment movements during maintenance activities
- potential accidental loss of ammonia during storage and transfer
- potential leaks and spills of chemicals and fuels during maintenance activities or as result of fire water overflowing from substation bunds during an emergency.

Potential impacts on flooding relate to structures and infrastructure creating obstructions and changes to natural surface water flows.

There is potential for ammonia contamination into surrounding waterways if not managed appropriately. In 2000, the Australian and New Zealand Environment and Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand established trigger levels of 320-500 micrograms of ammonia per litre of water (DCCEEW, 2023a).

6.9.3 Proposed investigations and assessment

A detailed hydrology, flooding and water quality assessment would be included in the EIS. The assessment would address potential impacts, including:

- impacts on quantity and quality of surface water resources and flooding
- water demand, water sources and any required licensing requirements
- impacts on waterfront land where the project infrastructure is located within 40 metres of the Hunter River or wetlands
- erosion and sedimentation risks and management measures during construction and operation.

6.10 Groundwater

6.10.1 Existing environment

The project study area is within the Hawkesbury to Hunter Coastal Sands groundwater source. Historically, groundwater at the project site has been very poor as a result of contamination from industrial activity.

The 2012 Douglas Partners *Report on Contamination Assessment* provides a conceptual cross section through the waste emplacement facility that appears to be generally consistent with the description in a 2006 RCA risk assessment (GHD, 2009) that reported a clay aquitard is present in parts of the site and provides some separation of the fill and underlying estuarine aquifer. Groundwater at Kooragang Island is generally present within three aquifers (GHD, 2017):

- fill aquifer
- shallow estuarine aquifer
- deep estuarine aquifer.

Groundwater within the fill and shallow estuarine aquifers is expected to flow towards the Hunter River and surrounding wetlands. Groundwater flow within the deep estuarine aquifer is towards the ocean. Hydraulic connections have been noted between the fill aquifer and the underlying estuarine aquifer.

Groundwater was encountered during previous investigations (GHD, 2017) at depths between 0.8 and 1.9 metres below ground level (mbgl).

6.10.2 Potential impacts

6.10.2.1 Construction

Potential impacts during construction of the project related to groundwater include:

- groundwater levels, flows and connectivity: these include changes to groundwater connectivity, groundwater flow direction, groundwater levels and recharge rates. During excavations for the Concept Plan development, groundwater could be intercepted, and temporary minor dewatering may be required. The preliminary desktop review of groundwater depths of the project study area indicates that foundation excavations may intercept groundwater
- groundwater chemistry: these include pollution of groundwater and changes to groundwater quality. There is some potential for spills or leaks to allow oil and grease contamination to enter shallow aquifers
- groundwater users: interference to aquifers resulting in a decrease or change in groundwater levels that subsequently affect groundwater users and/or groundwater dependent ecosystems and riparian areas.

6.10.2.2 Operation

The project is not expected to interact with groundwater during operation. As such, there are no expected material impacts on groundwater levels, flow or connectivity. Installation of impervious surfaces would result in minor reduced local recharge of groundwater at these locations, as precipitation that would normally fall on the recharge surface would be drained away. However, impacts are expected to be minimal as the surface water runoff is expected to infiltrate into the regional groundwater system regardless of the increased impervious area.

Potential impacts during operation of the project could relate to accidental spills in the workshop or warehouse, loss of oils and coolant from the substation and loss of ammonia. This could result in impacts to groundwater and as a consequence impact to local surface water and land.

Changes to groundwater may occur if groundwater is extracted during construction. Extraction of groundwater has potential to impact levels in adjacent wetlands; however, this would be a short-term impact and considered in the biodiversity investigation for the EIS.

6.10.3 Proposed investigations and assessment

A detailed groundwater assessment would be included in the EIS. The assessment would involve a desktop review of existing and available geological and hydrogeological information and features, including groundwater levels, hydraulic conductivity, groundwater flow directions, groundwater quality, groundwater dependent ecosystems (GDE's), and registered groundwater bores. The review would include geological maps, the Bureau of Meteorology (BOM) Australian Groundwater Explorer, the BOM GDE Atlas, and data/reports from studies in the study area.

The assessment would identify potential risks to groundwater, GDE's and other groundwater users during construction and operation of the project as well as preliminary potential groundwater risks resulting from the project. Avoidance, mitigation and management measures would be identified to minimise potential inflows and their impacts to the groundwater regime and users.

6.11 Hazard and risk

This section provides a preliminary hazard and risk analysis from a review against the Resilience and Hazards SEPP and to establish the context for future studies that would be required to demonstrate that offsite risk is reduced to a tolerable level to permit development.

To determine whether a development is considered potentially hazardous, the first step in the process is to compile the complete inventory of hazardous goods that are expected to be present on site, including transport activities. This includes the chemical name, Dangerous Goods class, and maximum expected quantity. After compiling the complete list of hazardous goods, the stored quantities/transport quantities are assessed against threshold quantities.

The screening method used to determine whether a development is potentially hazardous is dependent on the class of DG being assessed. Tables and figures provided in *Applying SEPP 33* (Department of Planning, 2011) have been reviewed for the respective screening method for each dangerous good. Ammonia, which is a class 2.3 (subsidiary class 8) dangerous good, has a screening quantity of 5 tonnes.

6.11.1 Existing environment

There is currently no ammonia storage or production at the project site. The site is relatively flat, with existing uses of the site and surrounds being predominantly industrial, shipping and port operations.

6.11.2 Potential impacts

6.11.2.1 Preliminary screening

For the project, potentially hazardous materials that have been identified include ammonia and hydrogen. Its relevant Dangerous Goods Classes, SEPP 33 screening method and threshold quantities have been summarised in Table 6.7 for materials stored on site, and Table 6.8 for transport screening.

Table 6.7 Screening thresholds per Applying SEPP 33 for Hazardous Materials that are expected/may be expected to be present at the facility

Hazardous material	UN No	DG class (subsidiary class)	SEPP 33 screening method	SEPP 33 screening threshold quantity	Proposed quantity
Ammonia (Anhydrous)	1005	2.3 (8)	Table	5 tonnes	90,000 tonnes
Hydrogen	1049	2.1	Figure 6: Class 2.1 Flammable Gases Pressurised	0.7 tonnes	57 tonnes

Table 6.8 Screening thresholds per *Applying SEPP 33* for Hazardous Materials that are expected/may be expected to be transported to/from the facility

Hazardous material class	Vehicle movements		Minimum quantity per load (tonne)	
	Cumulative annual	Peak weekly	Bulk	Packages
2.3	>100	>6	1	2
8	>500	>30	2	5

The proposed facility exceeds the screening threshold for storage and is therefore classed as potentially hazardous, therefore a PHA would be required to be completed for the facility. At present, it is assumed that there would not be transport of ammonia to/from the facility via vehicles, therefore transport effects are excluded from the initial screening process.

Further design refinements may involve shipping of ammonia by export, and the PHA during the EIS would assess transport of materials once further information is available.

6.11.3 Potential impacts

6.11.3.1 Major hazard facility considerations

Any facility that has certain chemicals in excess of the threshold quantity as per Schedule 15 of Work Health and Safety Regulation 2017 (WHS Regulations) is a major hazard facility (MHF).

Chemical threshold assessment

The MHF determination process requires an assessment of the total quantity of hazardous chemicals stored on the site against the Schedule 15 chemicals threshold value from WHS Regulation. The results of the assessment for the proposed facility are shown in Table 6.9.

Table 6.9 MHF Screening Thresholds per WHS Regulation for Hazardous Materials that are expected/may be expected to be present at the facility

Hazardous chemical	UN numbers	Threshold quantity (tonnes)	10% threshold (tonnes)	Proposed quantities (tonnes)	Notifiable?	In excess of threshold?
Ammonia	1005	200	20	90,000	Yes	Yes
Hydrogen	1049	50	5	57	Yes	Yes

The proposed storage volume of ammonia exceeds the threshold quantity in Schedule 15 chemicals of SafeWork Australia WHS Regulation (200 tonnes). The threshold for hydrogen is dependent on the method of storage (pressurised or liquified) and where the hydrogen storage is located and its proximity to other land use types. Therefore, the facility would be classified as a MHF. A notification would be required to NSW SafeWork.

6.11.3.2 Bushfire risk

The project site is not mapped as bushfire prone land (DPE, 2023c). The closest bushfire prone land is approximately 2 km east of the site, and 2 km west of the site. However, this is mapped as vegetation category 3 – medium bushfire risk, therefore, bushfire risk across the project site would be minimal.

Subsurface and near surface coal waste fires were triggered by bushfires in January 2019 within the project site. The fires were extinguished by flooding cells with water pumped from the Hunter River. Whilst remediation of the area has been carried out since 2019, further reducing the risk of subsurface fires through the capping and containment of the combustible materials, in dry and hot conditions with nearby brush fires, therefore remains a risk. This would be further evaluated during the EIS and would be assessed as part of the project specific risk assessment.

6.11.4 *Proposed investigations and assessment*

Risk prioritisation described in *Multi-level risk assessment* (Department of Planning and Infrastructure, 2011) has been applied to determine the level of risk assessment that would be required as part of PHA to support the development application. Preliminary indication from this prioritisation process indicates that a Level 3 quantitative risk assessment would be required for the Clean Energy Precinct to demonstrate that offsite risk has been reduced to a tolerable level. It is understood that PON are revising the Land Use Safety Study (LUSS) for the port. Results of future risk assessment and the PHA would need to be incorporated into the LUSS to determine cumulative level of risk from the entire port (including current and proposed future port operations).

Additionally, consideration must be made for the presence of other MHFs currently in the area or proposed, as there may be cumulative impacts from offsite events.

6.12 Traffic and access

6.12.1 *Existing environment*

The road network within the project study area includes several secondary roads used for operations of PON, including (see Figure 3.3):

- Cormorant Road (B63), a two-lane dual-carriageway running along the southern bank of PON, connecting Kooragang to the suburbs of Mayfield West and Stockton
- Southbank Road, an unsealed road connecting Cormorant Road to Ramsar Road on the southern boundary of the site
- Delta Road, a two-lane single-carriageway providing internal access to the project site from Cormorant Road.

Two main intersections in the area surrounding the project site are the Industrial Drive/George Street intersection and the Industrial Drive/Ingall Street intersection. Main road access to the proposal site is from Tourle Street, Delta Road and Minyan Way, all via Industrial Drive, that joins the Pacific Highway and New England Highway to the northwest. Industrial Drive is managed by Transport for NSW while Tourle Street and Delta Road and Minyan Way are managed by City of Newcastle.

The strategic routes and their key features are summarised below in Table 6.10.

Table 6.10 Strategic routes

	Pacific Highway (North)	**Pacific Highway (South)**	**Hunter Expressway**
Road standard	Primary route for trucks travelling to northern NSW	Primary route for trucks travelling to southern NSW, Sydney and the Central Coast	Primary route for trucks travelling to north-western NSW and western NSW
Function	High standard highway with two lanes per direction in a separated carriageway	High standard highway with two lanes per direction in a separated carriageway	High standard highway with two lanes per direction in a separated carriageway
Intersection controls	A number of signalised and priority-controlled intersections to Heatherbrae roundabout and grade-separated interchanges north of there	Grade-separated interchanges	Grade-separated interchanges
Posted speed	80 km/h between Industrial Drive and the Heatherbrae roundabout then 100 km/h	80 km/h for approximately 1 km after John Renshaw Drive/Pacific Motorway intersection then increasing to 110 km/h	110 km/h

6.12.1.1 Rail network

Rail infrastructure is available to service the project site (Figure 3.3). PON is currently serviced by North South Rail Corridor (called Main North between Sydney and Newcastle) and Hunter Valley rail Network.

6.12.1.2 Shipping

The project site is accessible to cargo ships via the shipping channel in the South Arm of the Hunter River.

6.12.1.3 Airports

The project site is located about 11.5 km southwest of Newcastle Airport. Consideration of potential aviation safety impacts and potential impacts on navigation instruments would be assessed in the EIS.

6.12.2 Potential impacts

Construction

Construction traffic associated with the project would include heavy and light vehicles related to:

- delivery of construction equipment and materials such as concrete, wires, cables and gravel
- delivery of construction equipment as well as the delivery of large equipment to be installed at the substation, buildings and storage tanks, etc.
- movement and/or removal of excavated soil and waste materials
- construction workers driving to and from the construction site
- delivery of construction equipment associated with water infrastructure.

Construction traffic is likely to use the surrounding major road network that is approved for use by heavy vehicles for transportation of key elements of construction plant and equipment and bulk material haulage. Light vehicles would typically be used to transport construction workers.

Some construction equipment and materials may be transported to the project site by shipping, railways or airports. This may be required for transportation of prefabricated items or materials that are not readily available locally within NSW.

Volumes of heavy and light vehicles generated during construction of the project may result in a noticeable increase in traffic using the surrounding road network, particularly along local roads where existing traffic volumes are typically lower. Estimates of truck and vehicle movements would depend on the adopted construction methodology and staging plans and would be described in the EIS.

There may be some temporary disruptions to traffic movements along roads within PON during construction. Construction may require temporary traffic management or lane closures for safety; however, this would be scheduled to minimise impacts during peak traffic periods. Any impacts associated with this are expected to be short in duration and unlikely to cause considerable disruptions to road or rail users.

Existing internal roads would provide access for provision of material, plant and equipment.

Operation

There would be potential increases in both rail and shipping operations once the Clean Energy Precinct is fully constructed and operational; however, these impacts would be assessed as part of future applications.

6.12.3 Proposed investigations and assessment

Construction and operational traffic and transport impacts would be assessed in the EIS by reviewing expected construction and operation activities, generated traffic volumes, haulage routes and distribution of construction traffic and impact of activities on road network performance, road access and safety, public and active transport.

The existing road network would be characterised, including the existing road widths and condition of the road surface, existing road capacity, daily and peak traffic volumes including consideration of peak holiday traffic and proportion of light and heavy vehicles. Current performance of key intersections would be reviewed on designated construction access routes along with accident history and safety requirements.

The assessment would consider requirements for maintaining access to properties, roads and active and passive recreation areas near the project site. Site access management strategies to minimise conflict and improve safety would be developed, along with management and mitigation measures to reduce impact of traffic during construction and operation.

6.13 Noise and vibration

6.13.1 Existing environment

6.13.1.1 Local noise sensitive receivers

The project site is adjoined by multiple heavy industrial land uses and large areas of unused land that acts as a buffer zone to any nearby noise sensitive receivers.

6.13.1.2 Existing noise environment

The project site is generally surrounded by a highly urban and industrialised environment, influenced primarily by noise from road and rail traffic, and industrial sources, in addition to operations within the existing port and harbour areas.

6.13.1.3 Existing vibration environment

Ground vibration impacts are generally limited to a small area surrounding the vibration source and rarely extend beyond approximately 100 metres. Existing ground vibration sources within the study area would include industrial activities and heavy vehicle movements on local roads, in addition to construction activities at development sites.

Ground vibration associated with road traffic is generally low, and large separation distances between the project site and residential receivers mean that the risk of existing vibration impacts at sensitive receivers is considered extremely low. The primary routes for heavy vehicles to access the site are existing designated heavy vehicle routes and as such project traffic is not expected to impact the existing vibration environment.

Vibration sensitive developments, such as micro-electronics, medical and imaging laboratories have not been identified within the project site.

Major, critical infrastructure exists within, and adjacent to the site, such as coal loading facilities, and gas pipelines. These items are not considered to be highly vibration sensitive.

6.13.1.4 Meteorological influences

Meteorological conditions can influence or reduce transmission of noise. In particular, weather conditions including atmospheric temperature inversions and wind conditions can have a substantial impact on noise levels. These impacts are most noticeable at distances of more than 500 metres.

Typical meteorological conditions in the area are summarised below.

Local meteorological conditions

Local wind patterns have been obtained from the BOM weather station at Williamtown (station number 061078), that is considered indicative of weather conditions at the site.

Inversion conditions are unlikely to form a part of the meteorological environment at this site. Wind directions are predominately from the west and northwest throughout much of the year.

Meteorological noise impacts

Given the typical strength and varying direction of wind at the site, and absence of temperature inversions, weather conditions are not considered to generally impact the transmission of noise from this site.

6.13.2 Potential impacts

Construction

Noise levels are likely to be highest around Mayfield West Industrial estate. A number of activities may impact on the local community such as:

- site establishment
- earthworks
- paving activities
- concrete works
- construction of infrastructure and buildings.

Given the large separation distances to vibration sensitive receivers, significant vibration impacts are not considered likely at this preliminary stage. However, vibration will be considered in the EIS.

Noise during construction has potential to impact on sensitive receivers at Sandgate, Warabrook and Mayfield West. Noise levels are likely to be highest around Mayfield West Industrial estate.

Operation

Operation of the electrical equipment, production facilities and buildings may impact on sensitive receivers at Sandgate, Warabrook and Mayfield West.

6.13.3 Proposed investigations and assessment

A detailed construction and operational noise and vibration assessment would be included in the EIS. Background noise level monitoring would also be conducted as part of the EIS.

6.14 Soils, topography and contamination

6.14.1 Site history and filling operations

Review of preliminary background reporting (GHD, 2017) indicates that Kooragang Island originally consisted of around 10 individual islands and mudflats separated by narrow intertidal river channels and covered in swampy intertidal habitats. The larger islands were composed of floodplain woodland and littoral rainforest, later cleared for agricultural applications in the 1880s. From the 1800s until the mid-1900s, the larger islands were utilised for grazing and dairy farming. In the late 1850s, reclamation of channels between the islands began, and continued until the 1930s, when the islands became amalgamated into a landmass similar to the present Kooragang Island west. The land was reclaimed using material from the dredging of Newcastle Harbour in the late 1880s.

It is understood that for the majority of cells/ponds across the precinct do not comprise engineered landfill liners or leachate collection systems. Various types of wastes were landfilled including inert solids such as coal washery rejects, general refuse, building and demolition wastes, concrete and refractory brick dust generated during crushing and more hazardous substances such as various forms of slag, ash residues and coke ovens gas main residue, asbestos, leaded dust, hydrocarbons, waste oils and semi-liquid tarry wastes, basic oxygen slag (BOS) flue dust and lime sludges. A number of areas are known to have been used for the controlled disposal of particular hazardous wastes including tar/oil/sludges, asbestos waste and BOS Flue Dust. Despite controlled filling, uncertainties do exist about where and at what depths certain wastes have been landfilled.

Filling of the site ended in late 1999 when the KIWEF ceased operation at the time of closure of the BHP Newcastle Steelworks. The state government became owner and licence holder (EPL 6437) for KIWEF in 2001. The management of the site was then passed to Regional Land Management Corporation in 2002 and later to Hunter Development Corporation in 2008.

6.14.2 Existing environment

6.14.2.1 Soils

A search of the Australian Soil Classification (ASC) Soil Type Map of NSW on 10 March 2023 identified two soil classifications within the project site that are consistent with the common soils of the landscape:

- hydrosols – commonly referred to as "wet soils"
- not assessed – soils that have not been assessed with a soil classification.

6.14.2.2 Remediation works

It is understood that HCCDC have completed the closure of the KIWEF site landfill in accordance with the Surrender Notice and are in the process of handing control over to PON.

Capping operations commenced circa 2001 with key stages outlined below:

- partial capping of Pond 5 (central eastern portion of KNWPON1) was completed circa 2001
- partial capping of the BOS Flue Dust area (southeastern corner of KSEPON1) completed circa 2009
- substantial ground improvement works were completed circa 2010 to support construction of the NCIG rail loop and fly over (the rail loop sits outside of the specified investigation boundaries)
- HCCCDC commissioned various contractors and consultants to undertake staged capping of various areas (Area 1, 2 and 3) of the KIWEF site over an extended period
- it is understood, based on information provided by PON (HCCDC, 2022) that remediation works for the Eastern Ponds area are nearing final stages of completion
- the eastern portion of the K2 area, known as Kooragang Island Emplacement Cell (eastern portion of KSWPON1 with additional areas appearing to extend beyond the specified investigation boundaries) was used by BHP Billiton for disposal of cement stabilised contaminated sediments dredged as part of the Hunter River Remediation Project. It is understood that capping works were completed in 2012 with the site scheduled for handover to PON at a future date.

The capping works carried out by HCCDC at the KIWEF landfill site have been developed and implemented for the purpose of closing the landfill site. It is expected that future remediation and capping works to the site would be required in order to accommodate the infrastructure associated with the Concept Plan.

Significantly contaminated materials encountered during remediation works were processed according to a materials management plan (RCA, 2012). It is understood that a thinner and more variable interim capping layer may be present across much of the remainder of the site (outside of the capped audited areas) where there exists potential for significantly contaminated materials to be encountered during shallow excavations.

6.14.2.3 Contamination risk

Based on the review of available information (GHD, 2009 and Douglas Partners, 2012) the key contaminants of concern at the site are understood to be generally associated with wastes placed as fill materials across the various sites, and may include:

- pH
- asbestos
- various heavy metals (aluminium, cadmium, copper, iron, manganese, mercury, molybdenum, nickel, zinc)
- ammonia

- cyanide
- sulfur
- potassium
- hydrocarbons (volatile to heavy end)
- benzene, toluene, ethylbenzene and xylene
- polycyclic aromatic hydrocarbons
- phenols.

Contamination across the site has generally been identified as being a low to moderate risk to human health or environment; however, a number of areas were identified as containing significantly contaminated material that may pose a higher level of risk to human health or the environment (GHD, 2009).

6.14.3 Potential impacts

It is understood that HCCDC are currently working with the NSW Environment Protection Authority (EPA) on developing a plan of management for the site. This plan of management would address the ongoing management and monitoring for the existing (undeveloped) site. PON would develop its own plan of management in consultation with the NSW Treasury (the Landowner) and the EPA to take into account development of the infrastructure associated with the project. PON's plan of management would be developed in accordance to the requirements of the Remediation Deed, the Surrender Notice and any future environmental licencing requirements.

Construction

Construction works within capped areas should be undertaken to avoid disturbance of capping integrity. Where works are required to penetrate cap, stringent controls would be required to:

- manage human health and environmental impacts from exposure to underlying contaminated materials
- reinstate capping materials and validate.

Construction works within uncapped areas would likely require significant remediation works and associated management. Additionally, capping of un-remediated areas may involve disturbance of established Green and Golden Bell Frog habitat.

Interaction with underlying impacted materials would need to be managed under a materials management plan that would include consideration of worker health and safety controls, high level and detailed material characterisation, material tracking, waste classification, stockpile management and validation.

Additionally, there is potential for construction phase activities to alter or exacerbate surface water and/or groundwater risks that may impact sensitive on-site and off-site receptors.

Operation

During operation, the project is not anticipated to have a substantial impact on contamination risks under normal operation. Risks related to leaks and spills would be minimised through adoption of best practice design principals and suitable operation environmental management plan(s) developed in accordance with the PON's plan of management for the site. All maintenance works would need to be managed in accordance with construction phase controls outlined above as well as the PON's plan of management and any future environmental licencing requirements.

6.14.4 Proposed investigations and assessment

Consultation is required with all stakeholders for proposed investigations and assessment, particularly the Site Auditor.

Prior to further intrusive investigation, a preliminary site investigation would be prepared that includes tabulation of all available historic data for assessment against current applicable screening criteria indictive of potential human health and environmental risk. The preliminary site investigation would inform a data gap assessment and subsequently preparation of a sampling, analysis and quality plan.

A detailed site investigation would likely include extensive intrusive investigations to assess soil, groundwater, surface water and soil vapour risk from potential impacts of all the construction and operational activities associated with the project. Pending outcomes of a detailed site investigation, available pathway for remediation of uncapped areas, a remediation action plan and subsequent validation works (likely requiring a Site Audit Statement) would be assessed.

Further, detailed geotechnical investigations would also need to be carried out to inform the design of the project.

All works to be undertaken in general accordance with guidelines published or approved by the EPA under Section 105 of the CLM Act and any other relevant guidelines.

6.15 Air quality and greenhouse gases

6.15.1 Existing environment

Ambient air quality within the project site would be affected by a number of factors including topography, prevailing meteorological conditions and local and regional sources of potential air pollution. Primary industrial sources of air emissions include the OneSteel and Smorgen facility at Mayfield, Orica and Incitec plants on Kooragang Island and the Tomago Aluminium smelter to the north, emissions from coal and grain and three fuel storage facilities in Newcastle, as well as Stolthaven bulk liquids Mayfield No. 7 berth.

The Newcastle Local Air Quality Monitoring Network is a network of three monitoring stations located at Stockton, Carrington and Mayfield that monitors the impacts of industrial activity in and around PON (EPA, 2023). The stations continuously monitor levels of:

- sulfur dioxide
- oxides of nitrogen
- particulate matter smaller than 10 micrometres in diameter (PM_{10})
- particulate matter smaller than 2.5 micrometres in diameter ($PM_{2.5}$).

The Lower Hunter map for air quality at the Mayfield station (approximately 1 km south of the project site) on 10 March 2023 showed PM_{10} was fair, and all other levels listed above were good (DCCEEW, 2023b). The overall current air quality in Newcastle on 10 March 2023 was good, based on the $PM_{2.5,}$ $PM_{10,}$ ozone, carbon monoxide, nitrogen dioxide and sulfur dioxide at Newcastle monitoring stations in the Lower Hunter Region (DCCEEW, 2023b).

Other air pollution sources within the area would include vehicle and dust emissions from roads and agricultural activities.

6.15.2 Potential impacts

Construction

During construction, local air quality within the project site may be temporarily affected by particulate (dust) and GHG emissions from activities such as:

- earthworks
- stockpile management
- access track and/or road construction (if required)
- construction of water infrastructure, pavements and buildings
- use of vehicles, plant and equipment
- increases in road, rail and shipping movements.

The main sensitive receivers for air quality impacts during construction would be workers at the port and nearby residents in surrounding suburbs such as Stockton and Mayfield. Air quality impacts from construction are expected to be short-term and minor due to the existing industrial operations in the area.

Gaseous emissions associated with combustion of fuel and combustion-related pollutants from construction plant and machinery would be manageable through maintenance and correct operation of equipment. GHG emissions are likely to be generated due to combustion of fuel for transport, consumption of electricity and waste. Use of construction equipment and manufacture of materials for use in the project would also consume resources associated with GHG emissions.

Operation

During operation, the project is not anticipated to significantly impact local air quality or GHG emissions. A minor amount of GHGs would be anticipated due to operation of machinery; however, these impacts are anticipated to be minimal. Operational air quality and GHG impacts would be manageable through the application of standard environmental management measures.

Ammonia

The National Pollutant Inventory (NPI) holds data for all sources of ammonia emissions in Australia. Human exposure to typical environmental concentrations of ammonia would not affect humans. Exposure to high levels of ammonia can cause irritation and serious burns on the skin and mouth, throat, lungs and eyes (DCCEEW, 2023c). Exposure to higher levels of ammonia could result from inhaling fumes, splashing onto the skin, consuming ammonia, or by leaks and spills at production plants and storage facilities, tank trucks, rail cars, and ships and vehicles that transport ammonia.

Safe Work Australia sets the workplace exposure standard for ammonia through the workplace exposure standards for airborne contaminants:

- maximum eight hour time weighted average: 25 parts per million (17 mg/m^3)
- maximum short term exposure limit: 35 parts per million (24 mg/m^3).

6.15.3 Proposed investigations and assessment

An Air Quality and Odour assessment would be included in the EIS. Air quality impacts associated with dust and emissions generated by construction activities would be assessed qualitatively based on the *Approved methods for the sampling and analysis of air quality pollutants in NSW* (EPA, 2022), relevant guidelines and the POEO Act.

The assessment would consider risk of dust and GHG emissions from construction and operation activities based on the scale and nature of the works and sensitivity of the area. Data requirements would include areas of soil disturbance, materials and equipment, vehicle movements, scheduling and likely location or distance to receivers of emission sources such as substations, laydown and stockpile areas and concrete batching plants. Site-specific mitigation measures would be identified to manage and minimise adverse impacts in the EIS.

6.16 Waste management and resource use

6.16.1 Existing environment

Port-related activities currently generate a range of wastes. Likely and expected waste streams for current activities at the port include putrescible and non-putrescible solid waste and municipal waste. The port is currently utilised for activities such as a General Cargo Handling Facility that generates industrial waste. Small volumes of general waste are currently generated from administration and other activities within the demountable buildings as well as maintenance activities across the site (PON, 2022).

Waste management and waste transfer facilities within and near the project site include the Summerhill Waste Management Centre and Solo Resource Recovery Centre.

6.16.2 Potential impacts

Construction of the project would result in a range of typical waste materials including:

- vegetation waste from clearing for enablement works and hardstand areas for installation and maintenance of future clean energy projects and internal access roads
- spoil from excavations
- surplus construction materials such as steel, concrete, construction off-cuts and packaging
- general domestic waste from construction and maintenance personnel
- waste and wastewater produced at construction compounds
- small quantities of waste oils, greases, chemicals and lubricants from operation of construction plant and equipment.

During operation, the main source of waste material is expected to be from putrescible and non-putrescible general solid waste from operation and maintenance personnel. Disposal of waste generated during construction and operation of the project is not anticipated to result in significant adverse environmental impacts as removal of waste generated would be managed through application of standard environmental management measures.

Resources used during construction and operation of the project would include:

- water (construction and operational phases)
- electricity (construction and operational phases)
- fuel (construction and operational phases)
- concrete (primarily construction phase)
- steel (primarily construction phase).

While the project would result in some increased demand on local and regional resources, it would be unlikely that the project alone would result in any resource becoming scarce or in short supply.

6.16.3 Proposed investigations and assessment

Preliminary identification of waste streams and volumes associated with construction and operation of the project would be included in the EIS. Management of waste would likely include standard management practices compliant with the *Waste Avoidance and Resource Recovery Act 2001* and other relevant policies and guidelines to avoid or minimise waste from the project.

Waste would need to be managed in accordance with the *Waste Classification Guidelines* (EPA, 2014). Construction waste would be segregated and stockpiled on site, with materials such as clean excavated soil, concrete, timber, plastic and metals separated for reuse or recycling. Any potentially contaminated or hazardous materials would need to be handled carefully and segregated to minimise the risk of cross-contamination. Waste requiring disposal would be directed to a waste management facility that is lawfully permitted to accept that type of waste.

6.17 Climate change

6.17.1 Existing environment

Climate is described in terms of long-term weather statistics for a particular location comprising averages, variations and extremes. AdaptNSW regional climate change snapshots provide an indicative view of climate change risks that are current influence on assets and operations across the project study area (AdaptNSW, 2023). Climate parameters considered in the snapshots include temperature, temperature extremes, rainfall, frost and fire weather.

The project site is located within the Hunter region. The region is characterised by rolling hills and wide valleys with a meandering river system on a wide flood plain. The Hunter region currently experiences variation in rainfall across the region, seasons and year to year. Temperatures in the Hunter region have been increasing since the 1960s (AdaptNSW, 2023).

Climate change is affecting the region, particularly through increasing temperatures, with projections showing temperatures are expected to rise, rainfall patterns would change and there would be an increased risk of severe weather events such as bushfire, rainfall and droughts. The AdaptNSW climate change snapshots present likely changes in climate in the near future (by 2039) and far future (2079). Near future changes could impact construction of the project, while far future changes are relevant to operational assets. These are summarised in Table 6.11.

Table 6.11 Likely changes in climate of the Hunter region by 2039 and 2079 (AdaptNSW, 2014)

Climate parameter	Near future (by 2039)	Far future (by 2079)
Temperature	Maximum temperatures are projected to increase by 0.4–1.0°C Minimum temperatures are projected to increase by 0.5–0.9°C	Maximum temperatures are projected to increase by 1.6–2.6°C Minimum temperatures are projected to increase by 1.5–2.5°C
Temperature extremes – hot days (reaching >35°C)	Number of hot days would increase	Number of cold nights would decrease
Rainfall	Spring and winter rainfall would decrease	Autumn rainfall would increase
Fire weather	Summer, spring, and winter average fire weather would increase	Summer and spring severe fire weather would increase

Based on a review of the CSIRO Climate Change in Australia Projections, Newcastle sits within the Eastern Australian super-cluster and East Coast cluster, with key climate projections for the cluster including (CSIRO, 2022):

- further increase in temperatures, with more hot days and warm spells, and fewer frosts
- a decrease in average winter and spring rainfall, however an increased intensity of extreme rainfall events
- a harsher fire-weather climate.

Australia is signatory to the United Nations Paris Agreement on Climate Change (Paris Agreement). Australia's emissions target is to reduce CO_2 emissions by 43 per cent below 2005 levels by 2030 under the Paris Agreement (DCCEEW, 2022a). The NSW Climate Change Policy Framework sets an aspirational long-term objective of achieving net zero emissions by 2050 (DCCEEW, 2022a). The NSW Government's *Net Zero Plan Stage 1: 2020–2030* sets out how the NSW Government would deliver on moving toward net zero over the next decade (DPIE, 2021).

6.17.2 Potential impacts

During construction, climate change risks would be associated with severe weather events, such as extreme temperatures, flooding, changes in rainfall patterns and fire risk, placing increased pressure on control measures to prevent flooding, erosion and sedimentation and bushfire ignition. Extreme weather could delay construction of the project, damage materials and cause adverse health impacts for workers.

Operational vulnerability to climate change could include:

- an increase in the number and severity of weather-related electricity outages
- flooding of substation/project site causing damage to equipment with effort and time required to clean up and repair equipment
- damage from bushfires, often coinciding with the increased demand for electricity from high temperatures.

The project involves concept plan approval for the Clean Energy Precinct, that would support the build out of clean, low-emission, reliable and affordable energy to the NEM. The project would contribute to reducing NSW's GHG emissions and would help achieve Australia's net zero goals.

6.17.3 Proposed investigations and assessment

Resilience of the operational assets to extreme weather would be considered in the detailed design of assets, such as allowance for wind loading, sag and appropriate clearances for transmission lines, cooling systems for substations and transformers, and other buildings and associated infrastructure. Assessment and development of mitigation measures for climate-related impacts would be carried out in the EIS for related issues such as surface water, flooding and hydrology.

Ongoing monitoring would be undertaken during operation of the project to assess potential impacts to GHG emissions and other pollutants as a result of the project. The NPI database collects information about emissions and transfers of 93 substances across Australia (DCCEEW, 2023c). Facilities that exceed thresholds for a substance are legally required to report emissions of that substance to the NPI, in NSW the requirements to report emissions through the NPI is enforced through the POEO Regulation 2022.

6.18 Cumulative impacts

Cumulative impacts of the project would be assessed in the EIS in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022). The guidelines provide a framework for assessing and managing project-level cumulative impacts.

Assessment of cumulative impacts focuses on environmental issues within the project and the project's interaction with other projects in the vicinity, and where construction and/or operational timeframes are likely to be concurrent.

A preliminary cumulative impact assessment was undertaken for the project and is provided below.

6.18.1 Proposed assessment

There are six key steps to the cumulative impact assessment as outlined in the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022). The purpose of a cumulative impact assessment is to assess project specific impacts from an existing baseline condition as well as combined impacts of the project with other known or foreseeable future developments.

To evaluate potential impacts in the EIS, two broad types of assessment would be undertaken: incremental and cumulative. Incremental types are standard practice for all project-level environmental impact assessment, whereas cumulative types are effective where there is potential for material cumulative impacts with other relevant future projects.

At this early stage of the project, the cumulative impact assessment identifies key questions that would inform the SEARs and future EIS (see Table 6.12).

Table 6.12 Scoping cumulative impacts – key questions

Scoping questions	Considerations	Commentary
What to assess	Government strategic planning framework for the area having regard to relevant legislation, plans, policies or guidelines.	Consideration of key legislation, plans, policies or guidelines is provided in Chapter 4.
	The project and other potentially relevant future projects that may be developed over the same time period or similar timeframes as the project.	Site setting and features from a regional and local context are discussed in Section 6.5, 6.7 and 6.8 which notes: — key land uses and economic activities within the region — closest population centre is the City of Newcastle — nearest major waterway is the Hunter River — Hunter Estuary Wetlands and Ramsar wetlands are adjacent — there are a number of proposed clean energy projects and existing heavy industry located in proximity to the project — there is potential for impacts of these proposed projects to combine with potential visual, hazards and other environmental impacts of the project, generating cumulative impacts that are greater than impact of each project individually.
	Potential material impacts on features including National Parks and other protected areas, environmentally sensitive areas, threatened species and ecological communities, important natural resources, culturally significant resources, key infrastructure and industries, sensitive land use zones, population centres, settlements and residential areas.	
	The likely scale and nature of the cumulative impact of these projects.	
What study area	The study area selected for the cumulative impact assessment of each matter would vary depending on the specific characteristics of the assessment matter and the scale and nature of the potential impacts on the matter resulting from the project with other relevant future projects.	The study area for matters subject to cumulative assessment would be guided by relevant technical assessments and locality features.
Over what time period	Like the study area, the time period selected for the cumulative impact assessment on each matter would vary depending on the characteristics of the matter and the scale and nature of the potential impacts on the matter. In most cases, the period selected is likely to match the life of the project (e.g. 50 years). However, in some cases the period selected may be much shorter than this and cover a single phase of the project, or much longer.	The proposed timeframe for the development of the project is: — Planning and Approvals: completion late 2024 — Construction: 2025 — Operation: from 2026/27.

Scoping questions	Considerations	Commentary
What projects to include	Build upon past and current operating project assessments by considering the cumulative impacts of the proposed project on key matters when other future proposed projects are included in the assessment.	See Section 6.18.2.

The issues subject to cumulative assessment for the project, including the study area extent and time period are described in Table 6.13.

Table 6.13 Issues to be assessed in the cumulative impact assessment

Issue	Rationale	Study area extent	Time period
Terrestrial ecology	Due to some vegetation removal required, possibility of other future projects removing the same PCTs and habitat for threatened species that may be impacted by the project.	The cumulative biodiversity impact area would be based on the range and distribution of potential listed threatened species and would focus on those species that are at risk of serious or irreversible harm due to cumulative impacts of the project with other relevant future projects.	Construction and operation
Aquatic ecology	Potential cumulative impacts to the Hunter River Estuary and Ramsar Wetlands due to their proximity to the project site and other projects in the area.	Locations where the project could impact on aquatic ecology including the Hunter River as well as other relevant future projects.	Construction and operation
Aboriginal cultural heritage	Combined effects of ground disturbance could impact on Aboriginal archaeological items.	Locations where the project could impact on sensitive items as well as other relevant future projects.	Construction and operation
Non-Aboriginal heritage	Potential combined impacts to nearby non-Aboriginal heritage items.	Locations where the project could impact on sensitive items as well as other relevant future projects.	Construction
Social	Positive and negative impacts are anticipated in combination with other future projects and short-term cumulative impacts such as community benefits and impacts during construction.	Regional social and economic impacts for the project and other relevant future projects.	Construction and operation
Economic	Positive impacts are anticipated in combination with other projects, with construction and operational stages generating opportunities for local employment and suppliers that would benefit the local economy.	Regional social and economic impacts for the project and other relevant future projects.	Construction and operation

Issue	Rationale	Study area extent	Time period
Land use	Changes to availability of future or planned land uses, when combined with construction or operation of other future projects, especially on land that is currently used or zoned for agricultural or forestry purposes.	No changes are proposed to the current land zoning and land use requirements of the project site.	Construction and operation
Property	Temporary leasing, permanent acquisition, and new easements on land titles.	No changes are proposed to the current tenure arrangements of the project site.	Construction and operation
Landscape character and visual amenity	Proximity to proposed future projects.	Specific viewpoints or landscapes impacted by more than one project.	Construction and operation
Hydrology, flooding and water quality	Construction activities with potential to impact surface water, and near other relevant future projects.	Downstream impacts where other relevant future projects are in the same catchment as the project. Potential for contaminants and/or sedimentation and erosion to impact surface water.	Construction
Groundwater	Potential impacts to groundwater levels, chemistry and uses with combined effects from other projects.	Locations where other relevant future projects are in the same catchment as the project.	Construction
Hazard and risk	Potential cumulative impacts with other similar projects in the area. Impacts relating to ammonia storage and exceeding threshold quantities.	Locations where other relevant projects exist within proximity to the project site.	Construction and operation
Soils, topography and contamination	Potential cumulative impacts relating to contamination, soils, erosion and sedimentation.	Areas where there may be an overlap with contamination areas or other projects within close proximity to the project site undertaking excavation works.	Construction
Bushfire	An increase to fire risk during construction and operation in bushfire prone areas.	No areas of bushfire prone land have been identified within the project site. Potential risk of subsurface fires at the project site. This would be assessed further in the EIS.	Construction and operation
Traffic and access	Where construction of the project occurs at the same time and area as future potential major projects that generate large volumes of traffic.	Specific main transport routes where there is an overlap of potential traffic impacts.	Construction
Noise and vibration	Where construction and operational noise impacts of the project overlap with the noise impacts of other relevant future projects and result in material noise impacts on certain sensitive receivers.	Areas at the specific locations where there is an overlap of noise impacts resulting in impacts on certain sensitive receivers.	Construction and operation

Issue	Rationale	Study area extent	Time period
Air quality and GHG	Cumulative air quality impacts with nearby projects and potential to accumulate GHG emissions.	Other projects within proximity to the project site that have potential to generate GHG emissions.	Construction and operation
Climate change	Other future relevant projects impacted by changing climate such as severe weather events, extreme temperatures, flooding and changes in rainfall.	Areas at specific locations where climate change impacts have been identified.	Construction and operation
Waste management and resource use	Where other future relevant projects use the same waste management facility/facilities.	Waste management facilities that may need to service several projects.	Construction

6.18.2 Future projects

Relevant future projects to consider in the cumulative impact assessment would be identified through a search of:

- DPE's online major projects database
- NSW Government's list of Special Activation Precincts
- projects declared to be controlled actions under the Commonwealth EPBC Act
- local Council websites
- major greenfield and urban renewal development scheduled for the area
- consultation with PON stakeholders.

A search of DPE's online major projects database was carried out in July 2023 to identify SSD and State Significant Infrastructure (SSI) projects within 20 km of the project site. There are no major greenfield and urban renewal developments scheduled in the area. The nearest greenfield housing development is located at Fern Bay, approximately 5 km east of the project site.

A cumulative impact assessment scoping summary table for the project is provided in Table 6.14.

Table 6.14 Cumulative impact assessment scoping summary table

Project	Distance to project (approx.)	Project status/ indicative timing/ overlap	Potential overlap between impacts of Project and impact of other projects						
			Access (traffic)	Biodiversity	Hazards and risk	Amenity – noise	Amenity – visual	Social (workforce, workers, health and wellbeing, goods and services)	Air quality
SSD-31940756 Beresfield Battery Energy Storage System	10 km northwest of the project site	Response to Submissions. Construction expected to take 10 months. Potential for construction overlap. Operational overlap.	Potential overlap in access, traffic and transport impacts during construction and operation between projects.	Low risk of overlap in biodiversity impacts due to distances between projects. Potential overlap in impacts to Green and Golden Bell Frog.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk of overlap in noise impacts due to distances between projects.	Low risk of overlap in visual impacts due to distances between projects.	Low risk to cumulative social impacts, given the distance of this project from the proposed project. Further assessment required.	Low risk to cumulative air quality impacts given distance between projects.
SSD-45565471 Kooragang Island Liquid Waste Facility Expansion	2 km east of the project site.	Prepare EIS. Potential construction overlap, operational overlap with the project.	Likely overlap in access, traffic and transport impacts due to proximity of project and proposed project.	Potential and likely cumulative biodiversity impacts during construction and operation, particularly to the Green and Golden Bell Frog and Ramsar Wetlands.	Likely cumulative hazards and risk impact due to proximity of projects to each other and nature of the project.	Likely cumulative noise impacts if construction overlaps, due to proximity of project and proposed project.	Potential overlap in visual impact due to projects being located on Kooragang Island.	Potential risk of cumulative social impacts due to proximity of projects and timing of construction and/or operation.	Potential risk of overlap in air quality impacts during construction. Operational air quality impacts would be negligible.
MP07-0031-MOD 1 Tomago Asphalt Facility Increase utilisation threshold	6 km northwest of the project site	Determination. No construction overlap expected.	Low risk to access, traffic and transport impacts due to timing of projects and distances between projects.	Low risk of cumulative biodiversity impacts.	Potential cumulative hazards and risk impacts.	Low risk of cumulative noise impacts.	Low risk to cumulative visual impact due to distances between projects.	Low risk of cumulative social impacts.	Low risk of cumulative air quality impacts.

Project	Distance to project (approx.)	Project status/ indicative timing/ overlap	Potential overlap between impacts of Project and impact of other projects						
			Access (traffic)	Biodiversity	Hazards and risk	Amenity – noise	Amenity – visual	Social (workforce, workers, health and wellbeing, goods and services)	Air quality
MP08-0129-MOD 7 Orica AN1 ANSOL Supply System Upgrade	4 km east of the project site	Prepare Mod Report. Potential overlap during construction. Operational overlap.	Low risk to access, traffic and transport impacts.	Potential risk of cumulative biodiversity impacts.	Potential cumulative hazards and risk impacts.	Potential for some cumulative noise impacts if construction overlap.	Low risk to cumulative visual impact due to distances between projects.	Low risk of cumulative social impacts.	Low risk of cumulative air quality impacts.
SSD-41814831 Newcastle Education Campus	5 km south east of the project site	Exhibition. Potential construction overlap. Operational overlap.	Potential risk in access, traffic and transport impacts.	Potential risk of cumulative biodiversity impacts.	Low risk of overlap in hazards and risk impacts.	Low risk for cumulative noise impacts.	Low risk to cumulative visual impact due to distances between projects.	Low risk of cumulative social impacts.	Low risk of cumulative air quality impacts.
SSI-10037 Newcastle Gas Terminal	3 km east of the project site	Prepare EIS. Construction expected to take around 12 months. Potential construction overlap. Operational overlap.	Potential risk in access, traffic and transport impacts.	Potential risk of cumulative biodiversity impacts, particularly during construction overlap.	Potential cumulative hazards and risk impacts.	Some potential for cumulative noise impacts if construction overlap, due to proximity of projects from one another.	Potential risk to cumulative visual impact.	Potential risk to cumulative social impacts.	Potential risk to air quality impacts during construction if construction between the projects overlap.
SSD-54974974 North Hangar Extension at BAE Systems, Williamtown	13 km northeast of the project site	Prepare EIS. Construction expected to start in Q3 2023 and take around 12 months. Potential construction overlap. Operational overlap.	Low risk in access, traffic and transport impacts.	Low risk of cumulative biodiversity impacts.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise impacts due to distances between projects.	Low/minimal risk to cumulative visual impact.	Low risk to cumulative social impacts.	Low risk to cumulative air quality impacts.

Project	Distance to project (approx.)	Project status/ indicative timing/ overlap	Potential overlap between impacts of Project and impact of other projects						
			Access (traffic)	Biodiversity	Hazards and risk	Amenity – noise	Amenity – visual	Social (workforce, workers, health and wellbeing, goods and services)	Air quality
SSD-10447 Remondis Resource Recovery Facility Tomago	6 km northwest of the project site	Determination 2021. No construction overlap. Operational overlap.	Low risk in access, traffic and transport impacts.	Potential risk of cumulative biodiversity impacts, particularly to nearby Ramsar Wetlands and Green and Golden Bell Frog.	Potential cumulative hazards and risk impacts.	Low risk for cumulative noise impacts due to no construction overlap.	Low/minimal risk to cumulative visual impact.	Low risk to cumulative social impacts.	Potential risk to cumulative air quality impacts during construction.
DA140-6-2005-MOD 3 Stockton Sand Quarry (Mod3) – Expanded extraction area	10 km northeast of the project site.	Assessment (more information required). Potential construction overlap. Operational overlap.	Low risk in access, traffic and transport impacts due to distances between projects.	Low risk of cumulative biodiversity impacts due to distance between projects.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise impacts due to distances between projects.	Low/minimal risk to cumulative visual impact.	Low risk to cumulative social impacts.	Low risk to cumulative air quality impacts.
SSD-52984213 Stockton dry sand extraction project	10 km northeast of the project site.	Prepare EIS. Potential construction overlap. Operational overlap.	Potential risk of cumulative impacts relating to access, traffic and transport impacts.	Low risk of cumulative biodiversity impacts due to distance between projects.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise impacts due to distances between projects.	Low/minimal risk to cumulative visual impact.	Low risk to cumulative social impacts.	Low risk to cumulative air quality impacts.
SSD-9490 Stockton sand quarry dredging	10 km northeast of the project site.	Assessment (more information required). Potential construction overlap. Operational overlap.	Potential risk of cumulative impacts relating to access, traffic and transport impacts.	Low risk of cumulative biodiversity impacts due to distance between projects.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise impacts due to distances between projects.	Low/minimal risk to cumulative visual impact.	Low risk to cumulative social impacts.	Low risk to cumulative air quality impacts.

Project	Distance to project (approx.)	Project status/ indicative timing/ overlap	Potential overlap between impacts of Project and impact of other projects						
			Access (traffic)	Biodiversity	Hazards and risk	Amenity – noise	Amenity – visual	Social (workforce, workers, health and wellbeing, goods and services)	Air quality
Williamtown SAP	12 km northeast of the project site	On exhibition. Construction expected to occur between mid-2023 and mid-2028. Construction and operational overlap.	Potential risk of cumulative impacts relating to access, traffic and transport impacts.	Low risk of cumulative biodiversity impacts due to distance between projects.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise impacts due to distances between projects.	Low/minimal risk to cumulative visual impact.	Potential risk to cumulative social impacts.	Low risk to cumulative air quality impacts.
MP08-0129-MOD 6 Orica Ammonium Nitrate Facility – Upgrade – MOD6 – Ammonia Storage Improvement	1 km south of the project site	Prepare Mod Report.	Potential risk of cumulative impacts during construction and operation relating to access, traffic and transport.	Likely cumulative impacts to biodiversity and Green and Golden Bell Frog and Ramsar Wetland due to close proximity and overlap of projects.	Likely risk in overlap and cumulative impacts relating to hazards and risks due to proximity between projects and projects both containing ammonia storage.	Likely cumulative noise and vibration impacts if overlap between construction and operation of the project.	Potential visual impact risks due to proximity of projects to each other.	Potential risk to cumulative social impacts.	Potential risk to air quality impacts during construction if construction between the projects overlap.
SSI-46360740-MOD 1 Lenaghan Lateral Pipeline	8 km west of the project site	Assessment (more information required).	Low risk of cumulative impacts during construction and operation relating to access, traffic and transport.	Low risk of cumulative biodiversity impacts due to distance between projects.	Low risk of overlap in hazards and risk impacts due to distances between projects.	Low risk for cumulative noise and vibration impacts.	Low visual impact risks due to proximity of projects to each other.	Potential risk to cumulative social impacts.	Potential risk to cumulative air quality impacts.

Project	Distance to project (approx.)	Project status/ indicative timing/ overlap	Potential overlap between impacts of Project and impact of other projects						
			Access (traffic)	Biodiversity	Hazards and risk	Amenity – noise	Amenity – visual	Social (workforce, workers, health and wellbeing, goods and services)	Air quality
DA18/95-MOD 4 Production Increase, New Load Out Shed and Solar Array	5 km southeast of the project site	Prepare Mod Report.	Potential and likely risk of cumulative impacts during construction and operation relating to access, traffic and transport.	Potential risk of cumulative biodiversity impacts due to distance between projects, particularly to aquatic biodiversity in the Hunter River.	Potential risk of overlap in hazards and risk impacts.	Likely cumulative noise and vibration impacts if overlap between construction and operation of the project.	Potential visual impact risks due to proximity of projects to each other.	Potential risk to cumulative social impacts.	Potential risk to cumulative air quality impacts during construction of the project, if overlap between the projects.

The EIS would include discussion on cumulative environmental impacts of the project. This would involve external and internal developments that may be proposed and may interact with the port and related activities that in combination may have a more significant impact than in isolation.

7 Preliminary scoping

7.1 Overview

An environmental risk analysis was undertaken as part of the Scoping Report to identify:

- potential impacts and issues to be considered as part of future impact assessments
- residual environmental impacts after implementation of mitigation measures.

This section outlines the context and method for the preliminary scoping of environmental matters.

7.2 Categorising assessment matters

Table 7.1 defines the risk rating for assessment of potential impacts used in this Scoping Report.

Table 7.1 Risk rating descriptions

Risk grade	Risk	Description
1	Low	— not likely to impact on siting, design, construction or operation stages and can be managed through generic environmental controls — specialist studies not likely to be required — mitigation is likely to show positive results.
2	Medium	— will need consideration during either siting, design, construction, or operation stages — specialist studies likely to be required to minimise potential environmental impact — external approval potentially required and is standard.
3	High	— critical issue that may have significant impact on siting or be a significant time and cost constraint — extensive specialist studies likely to be required — external approval likely to be required and may be onerous.

7.3 Approach to assessment

To evaluate the potential impacts, two broad types of assessment would be undertaken in the EIS: incremental and cumulative.

The Clean Energy Precinct would present its own unique risks that require assessment. Assessment of the project would take a risk-based approach to assessment of impacts such as hazards and risks, contamination, water quality and landscape character and visual impact. There are a broad range of social, environmental and economic considerations to be considered, including:

- Biodiversity
- Aboriginal heritage
- Non-Aboriginal heritage
- Soils and contamination
- Transport and traffic
- Surface and ground water
- Hazards and risk
- Waste and resource use
- Socio-economic
- Land use and property
- Contamination
- Cumulative.

7.4 Impact scoping

Results of impact scoping are presented in Table 7.2.

Table 7.2 Summary scoping table

Risk category	Potential constraints	Preliminary risk-rating	Comments/recommendations
EPBC Act Protected Matters	TECs, threatened flora and threatened fauna have been identified within the project site and surrounds (within 10 km). Of most concern is the Green and Golden Bell Frog that has a high likelihood of occurrence within the project study area. One Ramsar wetland is located within 5 km of the project site. This has potential to be impacted during construction and/or operation of the project.	High	A referral under the EPBC Act to the DCCEEW would be required for the project.
Biodiversity	The project study area contains mapped threatened species and threatened ecological communities. Key Fish Habitat is mapped within the Hunter River, which is adjacent to the project site. Coastal wetlands are mapped within some parts of the project study area. Potential to impact threatened biodiversity during construction and operation of the project due to activities such as excavation, impacts to surface water quality, removal of habitat, contamination and chemical spills.	High	A BDAR would be prepared as part of the EIS, that would further identify and clarify potential significance of biodiversity impacts associated with the project. The BDAR would be prepared in accordance with the BC Act and BAM.
Hazards and risk	Potentially hazardous materials that have been identified is ammonia and hydrogen. The proposed Clean Energy Precinct exceeds the screening threshold for storage and is therefore classed as potentially hazardous. Proposed storage volume of ammonia exceeds the threshold and the facility would be classified as a major hazard facility under the Work Health and Safety Regulation 2017.	High	A Level 3 quantitative risk assessment would be prepared as part of the EIS to demonstrate that the offsite risk has been reduced to a tolerable level.
Social	Potential impacts during construction and operation of the project on the local community include increases in traffic resulting in longer commute times, and awareness of potential risks associated with ammonia storage, cumulative exposure risks and altered visual environment.	Medium	A complex Phase 2 SIA would be prepared as part of the EIS.

Risk category	Potential constraints	Preliminary risk-rating	Comments/recommendations
Economic	The project would create significant expenditure within the local, regional and NSW economies during the construction phase. Operation of the project would facilitate a source of reliable, low-cost renewable energy with associated economic benefits to consumers across the NEM.	Medium	A detailed economic impact assessment would be prepared as part of the EIS.
Landscape character and visual amenity	The project would be consistent with the location within an operating port; however, the flare combined with infrastructure and buildings would change how the site is seen from various viewpoints. Moderate changes would likely occur to the visual environment during construction and operation.	Medium	A detailed Landscape Character and Visual Impact Assessment report would be prepared as part of the EIS.
Soils, topography and contamination	The project site is the former KIWEF site which was used as a waste emplacement facility. Contamination across the site has generally been identified as being a low to moderate risk to human health or environment; however, a number of areas were identified as containing significantly contaminated material that may pose a higher level of risk to human health or the environment. Operation of the project is not anticipated to have a substantial impact on contamination risks under normal operation.	Medium	Further, detailed geotechnical investigations would also need to be carried out to inform design of the project.
Hydrology, flooding and water quality	The project is located within the Hunter River surface water catchment and the Hunter Estuary and is bounded by the Hunter River South Channel (to the south), coastal wetlands (to the north) and Ramsar wetlands (to the north and west). There is potential for erosion and sedimentation impacts resulting from construction works such as earthworks and excavations for foundations, rail and road infrastructure (if required) and stormwater drainage. Potential impacts related to surface water and hydrology during operation due to changes in local hydrology, transport and deposition of sediment from ground disturbance, potential leaks and spills of chemicals and fuels during maintenance activities.	Medium	A detailed hydrology, flooding and water quality assessment would be prepared as part of the EIS.

Risk category	Potential constraints	Preliminary risk-rating	Comments/recommendations
Groundwater	Historically, groundwater at the project site has been very poor as a result of contamination from industrial activity. During construction, there is potential for the project to impact groundwater levels, flows and connectivity, groundwater chemistry and groundwater uses. Potential impacts during operation of the project could relate to loss of oils and coolant from the substation and loss of ammonia and hydrogen. This could result in impacts to groundwater and as a consequence impacts to local surface water and land.	Medium	A detailed groundwater assessment would be prepared as part of the EIS.
Traffic and access	Construction of the project would generate increases in traffic on the surrounding road network, increases in trucks and heavy vehicles, and increases in construction workers. Traffic and access impacts during operation are expected to be minimal and would be limited to vehicle travel by staff on internal access roads and the surrounding road network.	Medium	Construction and operational traffic and transport impacts would be assessed in the EIS.
Noise and vibration	Potential noise and vibration impacts during construction would occur during site establishment, vegetation removal, earthworks, paving activities, concrete works and construction of the site compound. Nearby residents in surrounding suburbs such as Mayfield and Stockton would be most affected by noise and vibration during construction. However, impacts are not expected to be significant. Operational noise impacts are not expected to be significant.	Medium	A detailed construction and operational noise and vibration assessment would be prepared as part of the EIS. Background noise level monitoring would also be conducted as part of the EIS process.
Air quality and greenhouse gas	During construction, local air quality within the project site may be temporarily affected by particulate (dust) and GHG emissions from activities such as earthworks, stockpile management, access track construction, use of vehicles, plant and equipment, and increases in road, rail and shipping movements. Impacts to air quality and GHG emissions during operation are expected to be minimal.	Medium	An Air Quality and Odour assessment would be prepared as part of the EIS.
Cumulative impacts	Cumulative impacts may arise during construction with other nearby known or foreseeable future developments. Potential overlap in impacts include noise and vibration, traffic and access, air quality and GHG emissions, social and economic, and biodiversity.	Medium	Two broad types of assessment would be undertaken: incremental and cumulative.

Risk category	Potential constraints	Preliminary risk-rating	Comments/recommendations
Aboriginal heritage	Surface disturbances such as excavation activities and vegetation removal could have adverse impacts on surface and subsurface features that could result in loss of heritage value. AHIMS search did not show any Aboriginal heritage items within the project site, with the closest site being approximately 20 metres southeast of the project site. There are a few waterways within close proximity to the site that would be considered in any future Aboriginal heritage assessment as these are more likely to present with Aboriginal heritage items.	Low	An assessment of potential impact to Aboriginal cultural heritage would be prepared as part of the EIS. Consultation would occur with Aboriginal communities.
Non-Aboriginal heritage	There are no known non-Aboriginal heritage items or places within the project site. The closest heritage item is the Former Migrant Camp, 690 metres to southwest of the project site, followed by the Remnant Garden 750 metres south of the project site. Both are listed as local heritage on the Newcastle LEP. Potential to impact nearby heritage listed items during construction of the project, however, impacts are unlikely.	Low	A desktop due diligence assessment for non-Aboriginal heritage would be prepared as part of the EIS.
Land use and property	The project site and surrounds are zoned SP1 Special Activities, with the area predominantly used for industrial and port-related activities. Operation of the project would result in a permanent change in land use from former waste emplacement to heavy industry to support the Clean Energy Precinct. There would be no land zoning changes as a result of the development.	Low	A desktop property and land use impact assessment would be prepared as part of the EIS.
Waste management and resource use	Construction waste from the project would include vegetation waste from clearing (if required), general domestic waste, wastewater, and small quantities of waste oils, greases, chemicals and lubricants. It is unlikely that the project alone would result in any resource becoming scarce or short in supply. Operation of the project is not expected to result in a significant amount of waste.	Low	Preliminary identification of waste streams and volumes associated with construction and operation of the project would be prepared as part of the EIS.

Risk category	Potential constraints	Preliminary risk-rating	Comments/recommendations
Climate change	Potential impacts including increases in GHG emissions and air quality impacts may arise during construction of the project. However, these are not expected to be significant. Operational vulnerability to climate change could include an increase in the number and severity of extreme weather events, flooding of the project site and damage from bushfires.	Low	Resilience of the operational assets to extreme weather would be considered in the detailed design of assets. Assessment and development of mitigation measures for climate-related impacts would be prepared as part of the EIS for related issues such as surface water, flooding and hydrology.

8 Conclusion

The project is subject to assessment under Part 4, Division 4.4 (Concept development applications) of the EP&A Act and as such, this document supports an application seeking the SEARs for the EIS. The preliminary assessment considered potential impacts during construction and operation of the project and considered the existing environment, scale and nature of the project, ability to avoid, minimise or mitigate impacts (for the scoping stage), cumulative impacts and the technical assessment of the project.

Key environmental assessment issues identified for the project, that would undergo a more detailed technical assessment during the preparation of the EIS include:

- Aboriginal heritage
- Air quality and greenhouse gas
- Biodiversity
- Hazards and risk
- Landscape character and visual amenity
- Land use and property
- Noise and vibration
- Socio-economic
- Soils, topography and contamination
- Surface water, groundwater and hydrology
- Traffic and access
- Cumulative impacts.

Other issues that would not require detailed technical assessment (including cumulative impacts), either based on lower likelihood of occurrence or absence of likely receptors, are as follows:

- Bushfire risk (Hazards and Risks)
- Climate change
- Non-Aboriginal heritage
- Waste management and resource use.

As part of preparation of the EIS, further assessment would be carried out in conjunction with the further refinement of the project design. In assessing potential environmental impacts of the project, the key focus would be avoidance and minimisation of impacts on the environment and local communities, where reasonable and feasible, when taking into consideration engineering constraints and cost implications. The assessment would identify mitigation and management measures to minimise impacts on the environment. Consultation with stakeholders and the local community would continue throughout the EIS assessment, design and construction phases.

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