STRATFORD RENEWABLE ENERGY HUB

SCOPING REPORT

YANCOAL
兖煤澳大利亚有限公司

STRATFORD RENEWABLE ENERGY HUB

SCOPING REPORT

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

ABBREVIATIONS AND ACRONYMS

%	percent
ABN	Australian Business Number
AEMO	Australian Energy Market Operator
AHD	Australian Height Datum
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
Biodiversity and Conservation SEPP	NSW *State Environmental Planning Policy (Biodiversity and Conservation) 2021*
CCC	Community Consultative Committees
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSSI	Critical State Significant Infrastructure
DC	direct current
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DECCW	Department of Environment, Climate Change and Water
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment
EII Act	NSW *Electricity Infrastructure Act 2020*
EIS	Environmental Impact Statement
EnergyCo	Energy Corporation of NSW
EPBC Act	Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*
EPA	NSW Environmental Protection Authority
EPI	Environmental Planning Instrument
EPL	Environmental Protection License
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW *Environmental Planning and Assessment Regulation 2021*
ETL	Electricity Transmission Line
FSL	Full Supply Level
FTE	Full-Time Equivalent
GL	gigalitre
GW	gigawatt
GWh	gigawatt-hour
ha	hectare
ISP	Integrated System Plan
km	kilometre
kV	kilovolt
LDS	Long Duration Storage
LEP	Local Environmental Plan
LGA	Local Government Area
LSC	Land and Soil Capability
LTES[1]	Long-term Electricity Supply
LTESA[2]	Long-term Energy Service Agreement
m	metre
MEG	Mining, Exploration and Geoscience
mm	millimetre
MNES	Matters of National Environmental Significance
MOL	Minimum Operating Level
MW	megawatt
MWh	megawatt-hour
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type

[1] In Section 2.2, definition sourced from AEMO (2021)

[2] In Section 2.2, definition sourced from DPIE (2021b)

PHES	Pumped Hydro Energy Storage
Planning Systems SEPP	NSW *State Environmental Planning Policy (Planning Systems) 2021*
PMLU	post-mining land use
PoEO Act	NSW *Protection of the Environment Operations Act 1997*
Precincts-Regional SEPP	NSW *State Environmental Planning Policy (Precincts—Regional) 2021*
Resilience and Hazards SEPP	NSW *State Environmental Planning Policy (Resilience and Hazards) 2021*
SCPL	Stratford Coal Pty Ltd
SEARs	Secretary's Environmental Assessment Requirements
SED	Stratford East Dam
SEPP	State Environmental Planning Policy
SMC	Stratford Mining Complex
Solar Farm	photovoltaic solar farm facility
SREH	Stratford Renewable Energy Hub
SSD	State Significant Development
SSI	State Significant Infrastructure
Transport and Infrastructure SEPP	NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021*
VRE	variable renewable energy
WAL	Water Access Licence
WM Act	NSW *Water Management Act 2000*
Yancoal	Yancoal Australia Limited

1 INTRODUCTION

Yancoal is proposing to develop the Stratford Renewable Energy Hub (SREH) at the site of the Stratford Mining Complex following the scheduled completion of mining in 2024.

The development of the SREH represents an opportunity to transition the site from a coal mine to a beneficial post-mining land use.

The SREH includes a Pumped Hydro Energy Storage (PHES) as well as a Solar Farm.

The PHES involves two reservoirs at different elevations, connected by a tunnelled waterway. Energy can be stored in the upper reservoir, and electricity is generated by allowing water to flow from the upper reservoir to the lower reservoir through a turbine. This provides a source of reliable and dispatchable energy during periods when solar/wind is not available, assisting with the stability of the NSW electricity grid as coal-fired power is phased out.

The Solar Farm is proposed to provide a portion of the energy required to pump water from the lower reservoir back to the upper reservoir.

The development of the SREH has a number of strategic advantages, including an existing source of water from the Stratford mine voids, ability to repurpose existing mining land and infrastructure, access to existing regional transport routes and population centres and direct access to an existing 132 kV ETL. These strategic advantages reduce potential impacts of the Project relative to other pumped hydro projects that may be developed in more remote locations and/or in undisturbed environments.

The development of the SREH also provides an opportunity for ongoing investment, employment and socio-economic benefits in the Gloucester Valley, following the cessation of mining.

Yancoal Australia Limited (Yancoal), an Australian coal producer, has been investigating diversification opportunities, including the development of renewable energy projects on its existing landholdings. A key opportunity identified by Yancoal is the development of the Stratford Renewable Energy Hub (SREH).

The SREH comprises a proposed Pumped Hydro Energy Storage (PHES) with an indicative capacity of 3.6 gigawatt-hours (GWh) (300 megawatts [MW] over 12 hours) alongside a photovoltaic solar farm facility (Solar Farm). The proposed Solar Farm would produce 330 MW direct current (DC) electricity to supply a portion of the energy requirements of the PHES.

Collectively, the PHES, the Solar Farm and associated infrastructure are referred to as “the Project”.

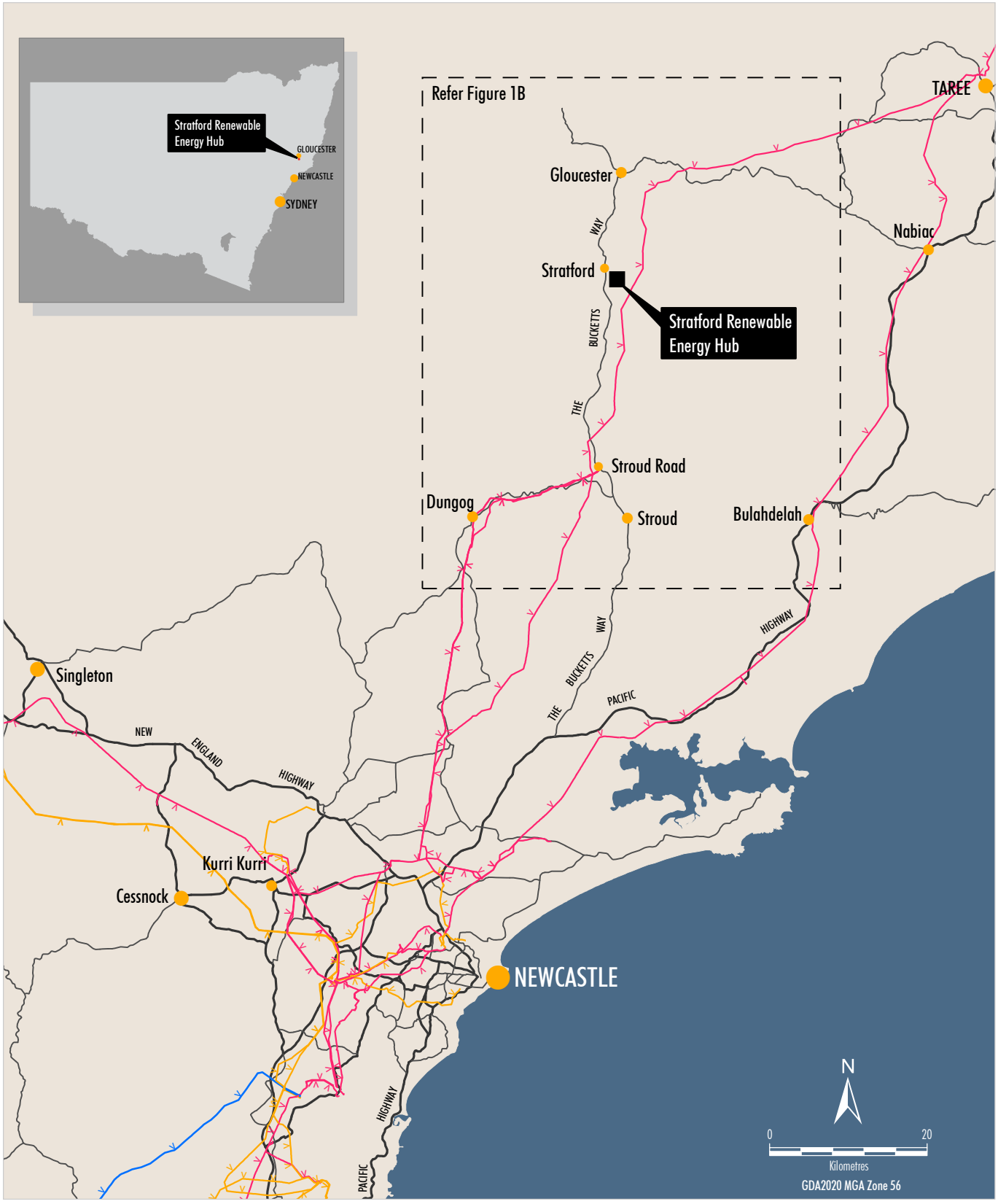
The Project would be capable of providing “Long Duration Storage” (LDS), being defined by the New South Wales (NSW) Government as projects capable of dispatching energy for a minimum duration of 8 hours. LDS provides a source of reliable and dispatchable energy during periods when solar/wind is not available, assisting with the stability of the NSW electricity grid as coal-fired power is phased out.

The Project would be situated on land associated with the existing Stratford Mining Complex (SMC), located in the Gloucester Valley, approximately 95 kilometres (km) north of Newcastle, NSW (Figures 1A and 1B). The SMC (Figure 2) is an open cut coal mining operation that is owned and operated by Stratford Coal Pty Ltd (SCPL), a wholly owned subsidiary of Yancoal. The SMC is scheduled to complete mining operations in 2024.

The Project is wholly located within the MidCoast Local Government Area (LGA). Yancoal owns all private land required to develop the PHES and the Solar Farm (Figures 3, 4 and 5).

The Project provides an opportunity to:

- assist NSW with the decarbonisation of its electricity network;
- provide a source of reliable and dispatchable energy, that can supply electricity to the grid when renewable energy from solar and/or wind is unavailable;
- assist in addressing an oncoming electricity supply shortfall identified by the Australian Energy Market Operator (AEMO) and the NSW Government due to the upcoming closure of coal-fired power stations;
- provide grid stability by storing excess energy supply from solar and other renewable energy sources, and releasing this stored energy during peak demand periods;
- beneficially use post-mining land, mine infrastructure and water stored in mine voids (to fill and top-up the PHES);
- use an existing TransGrid 132 kilovolt (kV) Electricity Transmission Line (ETL) easement that traverses the site, to export power from the PHES (subject to necessary upgrades to the ETL and agreement with TransGrid); and
- provide ongoing economic and social benefits, including continued employment opportunities for the Gloucester region.



LEGEND

- 132 kV Transmission Network
- 330 kV Transmission Network
- 500 kV Transmission Network
- State and Regional Roads

Source: NSW Spatial Services (2023)

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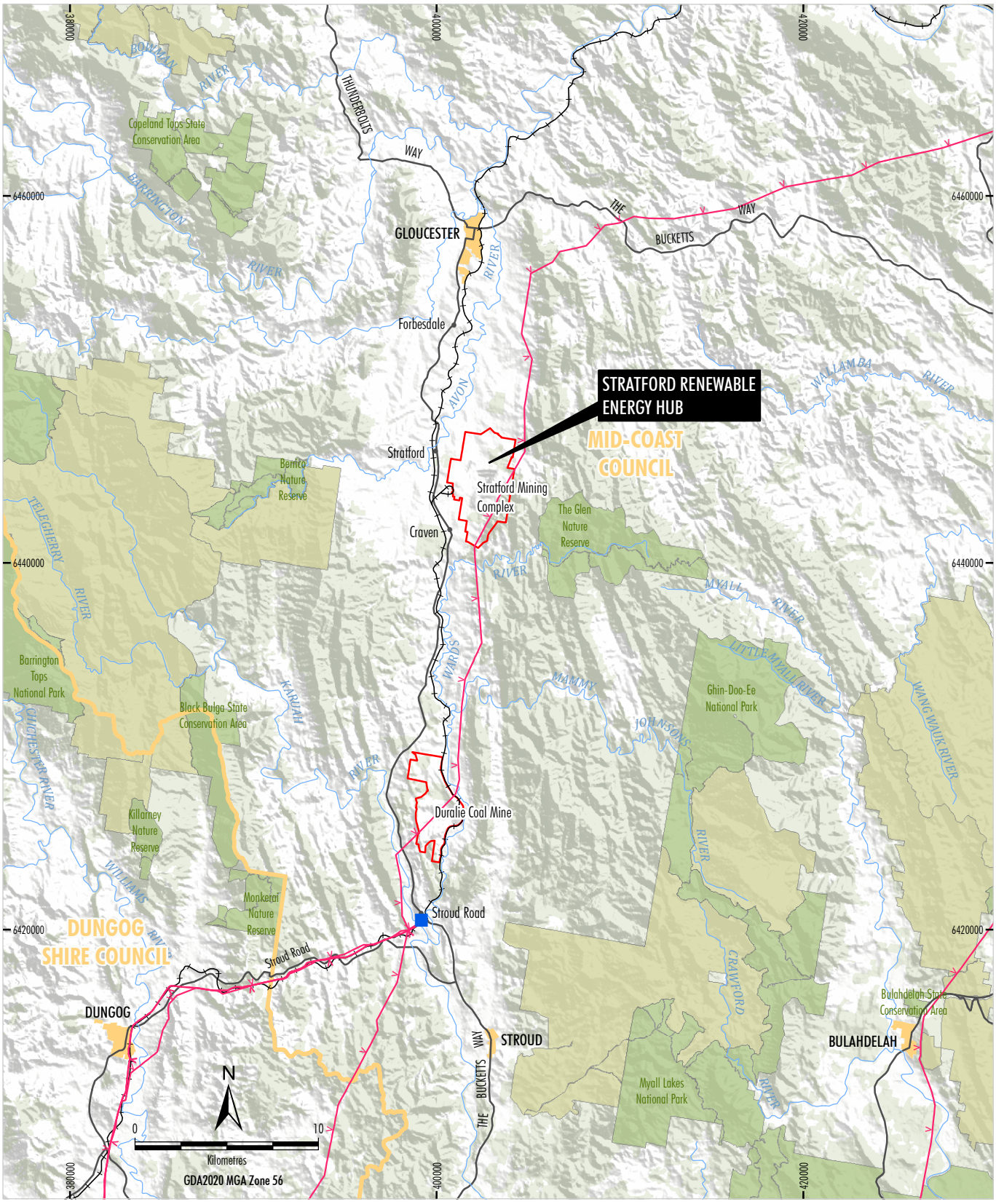
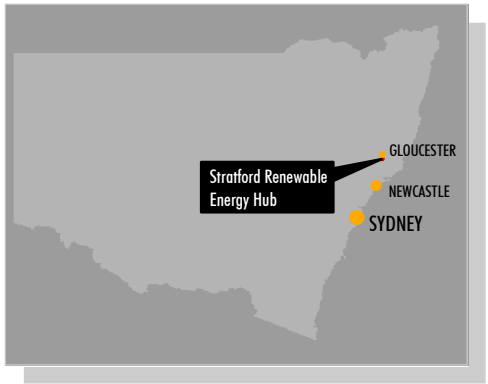
Regional Location

Figure 1A



YAN-22-45 SREH2020_SR_202A



LEGEND

- Mining Tenure
- State Forest
- NPWS Estates
- Local Government Area Boundary
- Transmission Substation
- 132 kV Transmission Network

Source: Geoscience Australia (2006); Yancoal (2023); NSW Spatial Services (2023)

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Project Locality

Figure 1B

YAN-22-45 SREH2020_SR_203A

LEGEND

- Mining Tenure
- 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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Approved Stratford Mining Complex

Figure 2

YAN-22-45 SREH2020_SR_209A

LEGEND

- 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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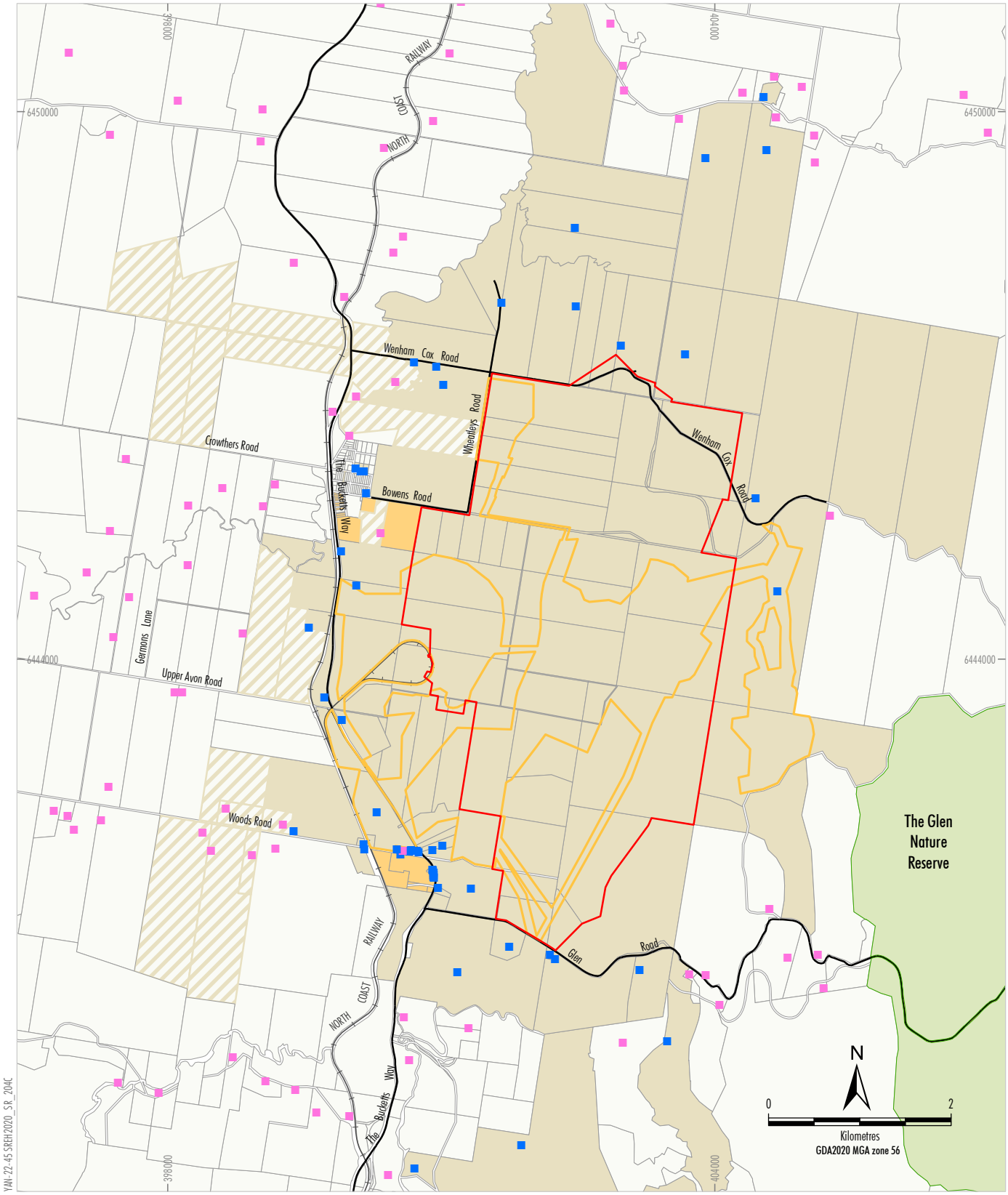
Indicative Study Area

Figure 3



LEGEND

- National Park, Nature Reserve or State Conservation Area
- Mining Tenure
- Preliminary EIS Study Area
- Crown
- Mine Owned
- Private Landholders - Yancoal Agreement
- Privately Owned
- Privately Owned Dwelling
- Mine Owned Dwelling

Source: NSW Spatial Services (2023); Yancoal (2023)

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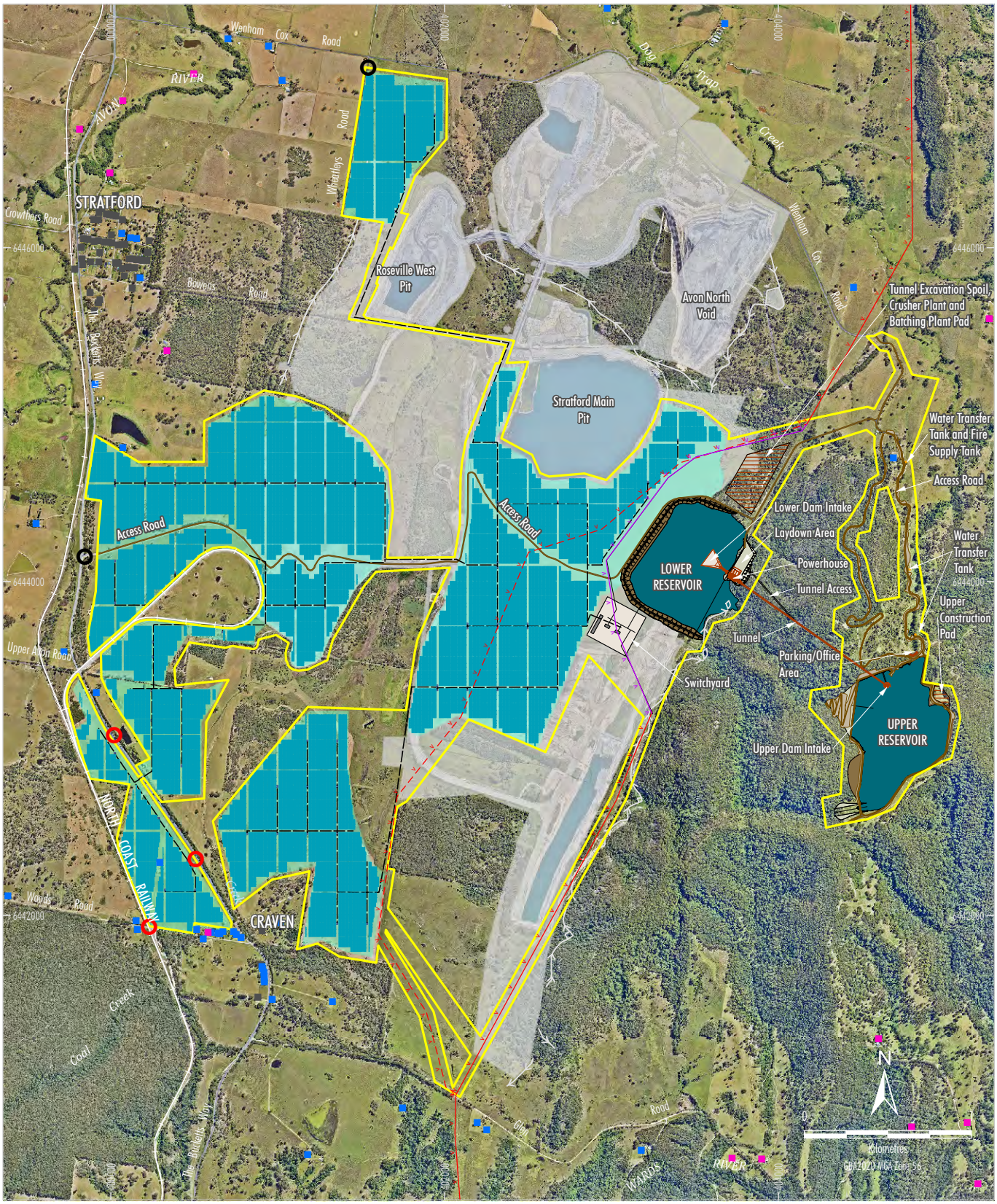
Land Ownership

Figure 4



LEGEND

- Existing 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Proposed Alternative 132 kV Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area
- Proposed Solar Photovoltaic Array Layout
- Area Subject to Potential Use for Solar Farm Assets
- Site Acess Point Option
- Site Acess Point
- Privately Owned Dwelling
- Resource Company Owned Dwelling
- Villages Dwellings

Source: NSW Spatial Services (2023); Yancoal (2023)

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Indicative General Arrangement

Figure 5

Yancoal has completed a Pre-Feasibility Study and is currently undertaking a Feasibility Study for the Project. The current estimated capital investment value is approximately $1.25 billion.

1.1 APPLICANT DETAILS

Gloucester Coal Pty Ltd (ACN 008 881 712), a wholly-owned subsidiary of Yancoal, is the applicant for the Project. Contact details for Gloucester Coal Pty Ltd are:

Gloucester Coal Pty Ltd
Level 18, Darling Park Tower 2,
201 Sussex Street, Sydney NSW 2000
(+61) 2 8583 5300

A dedicated website for the Project is:

www.stratfordcoal.com.au/page/SREH/

1.2 BACKGROUND

Key attributes have been identified for the Project that make it a commercially attractive opportunity with strategic advantages:

- ✓ Yancoal owns all private land required to develop the PHES and the Solar Farm.
- ✓ There is direct access to the existing 132 kV ETL and its easements.
- ✓ Mine voids can supply the water required for the PHES.
- ✓ Existing mine infrastructure and land can be repurposed and re-used for the Project.

As part of its diversification strategy, Yancoal is investigating several diversification opportunities, including the development of renewable energy projects across its landholdings. The Project is the most advanced of these opportunities.

The SMC is scheduled to complete mining in 2024. This timing presents an opportunity to integrate closure/rehabilitation activities with construction of the Project, allowing the site to be efficiently transitioned for beneficial re-use (subject to timely approvals). The SMC is in close proximity to existing electricity transmission infrastructure, provides suitable topographic variations for a pumped hydro project, and has access to water stored in mine voids.

These factors make the Project a commercially attractive post-mining land use (PMLU) opportunity that provides ongoing economic and social benefits to the local Gloucester community and would contribute to decarbonisation of the NSW electricity grid in the near-term.

1.3 PROJECT OBJECTIVES AND OVERVIEW

The key Project objectives are:

1. Operation of a PHES with an indicative capacity of 3.6 GWh (300 MW of renewable energy over a 12-hour period), which can be dispatched to the grid on demand.
2. Operation of a Solar Farm to reduce the requirement for PHES to source electricity from the grid to pump water from the lower reservoir to the upper reservoir.
3. Beneficial post-mining land use.

The final Project description (to be included in the Environmental Impact Statement [EIS]) will be informed by the outcomes of environmental assessments and stakeholder engagement.

It is expected that construction of the Project would include the following (Figure 3):

- Construction of an upper reservoir.
- Construction of a tunnelled waterway comprising a vertical shaft and inclined headrace tunnel between the upper reservoir intake and powerhouse, and a tailrace tunnel connecting the powerhouse to the lower reservoir.
- Augmentation of the existing Stratford East Dam (SED) to serve as the lower reservoir.
- Construction and operation of a “behind the meter” Solar Farm to supply up to 330 MW to the PHES, with optionality to export electricity to the grid in times of surplus solar generation.
- Re-alignment of the existing ETL across previously disturbed mine areas.
- Construction of an on-site electrical substation, to connect the PHES and the Solar Farm to the TransGrid ETL.
- Minor works in the public road network, such as intersection upgrades and installation of an ETL.
- Other associated construction and operational activities.

1.4 SUMMARY OF KEY AVOIDANCE, MINIMISATION AND OFFSET STRATEGIES

Avoidance and impact minimisation measures for the Project would be finalised in the EIS, including:

- Beneficial re-use of water contained within mine voids to initially fill and to top-up the PHES when required, avoiding reliance on external water sources.
- Management of water within the PHES, to prevent uncontrolled discharge to surface drainages and to minimise seepage to groundwater.
- Controlled release of water from the PHES, as required to maintain suitable freeboard in the upper and lower reservoirs during periods of prolonged wet weather.
- Use of the existing SMC access road for construction and operational traffic entering the site via The Bucketts Way, to minimise impacts to other traffic users.
- Maximising the use of existing SMC infrastructure for carparks, laydown areas, internal access roads, etc. to minimise additional disturbance associated with the Project.
- Upgrade of existing access tracks to facilitate construction of the upper reservoir to avoid constructing new tracks.
- Use of a tunnelled waterway rather than above-ground pipes, to minimise disturbance and visual impacts.
- Vegetative screening as required to minimise visual impacts along The Bucketts Way and any significantly affected private residences.

The Project would also include development of a biodiversity offset strategy as per the NSW *Biodiversity Conservation Act 2016* (BC Act).

1.5 APPROVAL PATHWAY

In September 2023, Yancoal sent a request to the NSW Minister for Planning requesting the Project be declared Critical State Significant Infrastructure (CSSI). This request was made on the basis that it clearly satisfies the NSW Government's requirements for CSSI as it addresses "*emerging resource shortages … or critical supply/demand imbalances*" (Department of Planning, Industry and Environment [DPIE], 2021a), namely the need for LDS in the energy sector to address imminent electricity reliability shortfalls identified by AEMO.

It is therefore evident the Project is "*necessary for the orderly function of the State and the NSW public would significantly benefit from the project for economic, environmental or social reasons*" (DPIE, 2021a).

The NSW Government has previously declared other pumped hydro developments as CSSI, including Oven Mountain (SSI-12422997) and Shoalhaven (SSI-10033).

If the Project is declared State Significant Infrastructure (SSI) or CSSI, it would be assessed under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Otherwise the Project would be assessed under Part 4 of the EP&A Act as State Significant Development (SSD).

Yancoal will also refer the Project to the Commonwealth Minister under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). Should the Project be considered a 'controlled action' by the Commonwealth Minister, it would likely be assessed under bilateral agreement by NSW.

1.6 RELATED DEVELOPMENTS

1.6.1 EXISTING DEVELOPMENT – STRATFORD MINING COMPLEX

The Project would be located on land owned by Yancoal that is currently used for the SMC (both mining areas and buffer lands).

The SMC operates under Development Consent SSD-4966. Mining operations are approved to be carried out at the SMC until 31 December 2025.

Rehabilitation and closure obligations are outlined in Development Consent SSD-4966 and various mining leases and exploration licences held by SCPL under the NSW *Mining Act 1992*. SCPL will undertake rehabilitation and closure activities for the SMC in parallel with the approval and construction of the Project.

Yancoal is seeking a new Infrastructure Approval or Development Consent for the Project. The proposed relationship between the Project and Development Consent SSD-4966 can be summarised as follows:

- If the Project is approved, its approval would overlap with Development Consent SSD-4966 with respect to some land, and until such time as SCPL surrenders Development Consent SSD-4966.

- In areas where the Project and SMC overlap, land uses approved for the Project could take precedence over the approved final land uses for the SMC (subject to commercial agreement).
- In areas where the Project and SMC do not overlap, or in the event that the Project does not proceed, SCPL would continue to rehabilitate the SMC in accordance with Development Consent SSD-4966.

It is not expected that Development Consent SSD-4966 would need to be modified to accommodate the Project, however this would be confirmed during preparation of the EIS.

1.6.2 DEVELOPMENT REQUIRED FOR THE PROJECT – SUBJECT TO SEPARATE ASSESSMENT

It is likely the existing Transgrid 132 kV ETL will require upgrades to facilitate the export of power from the Project to the grid. Any upgrade works would be the subject of a separate approval process, as required.

Yancoal has commenced consultation with TransGrid and Energy Corporation of NSW (EnergyCo) in relation to ETL upgrades.

Broader upgrades to the electricity transmission grid may be required and these upgrades would be undertaken by EnergyCo or TransGrid as part of the current transmission upgrades occurring across NSW to support the decarbonisation of the grid.

1.7 PURPOSE OF THIS DOCUMENT

This Scoping Report has been prepared to support a request for Secretary's Environmental Assessment Requirements (SEARs) for the EIS to be prepared for the Project.

This document provides an initial description of the Project for key State regulatory agencies to initiate the preparation of the SEARs for the Project.

The SEARs will identify matters that will need to be addressed in the EIS for the Project.

1.8 STRUCTURE OF THIS DOCUMENT

This document has been prepared in consideration of the *State Significant Development Guidelines* (Department of Planning and Environment [DPE], 2022a) and *State Significant Infrastructure Guidelines* (DPE, 2022b).

Other relevant guidelines that have been considered in the preparation of this document include:

- *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022c);
- *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022d); and
- *Social Impact Assessment Guideline for State Significant Projects* (DPE, 2023).

The remainder of this document is structured as follows:

Section 2	Strategic Context - identifies the key issues relevant to the justification and evaluation of the Project.
Section 3	Project Description - describes the context of the Project, provides a description and rationale for the Project.
Section 4	Statutory Context - outlines the permissibility of the Project and identifies potentially relevant statutory planning instruments.
Section 5	Community Engagement - outlines consultation with stakeholders that has already been undertaken for the Project and the consultation proposed to be carried out for the Project.
Section 6	Proposed Environmental Impact Assessment - identifies key environmental issues of particular relevance to the Project, outlines the proposed level and scope of environmental assessment, and identifies strategies to address the impacts identified.
Section 7	References

2 STRATEGIC CONTEXT

The Project is a renewable energy project that would provide reliable and dispatchable energy when solar/wind is unavailable, which:

- ✓ Would assist NSW (and Australia) in meeting its target of net zero emissions by 2050.
- ✓ Would assist NSW in meeting its legislated objective of an additional 2 GW of LDS by 2030 (subject to timely approvals).
- ✓ Would assist with addressing the electricity reliability shortfalls projected by AEMO due to the upcoming closure of coal-fired power stations.
- ✓ Proposes a PHES, which is recognised as the most established and lowest capital form of LDS.
- ✓ Is consistent with the NSW Government's *Hunter Regional Plan 2041* and *Practical guide: Post mining land use*, encouraging the investigation of beneficial post-mining land use (including specifically at the SMC).
- ✓ Is located at a previously industrialised site (as opposed to a remote and/or greenfield site).
- ✓ Has access to licensed water stored in mine voids, existing infrastructure that could be repurposed, regional transport routes and regional population centres.
- ✓ Has direct access to the existing 132 kV ETL and its easement.
- ✓ Would provide ongoing investment and socio-economic benefits in the Gloucester Valley.

This section outlines the strategic context, including the strategic need for and potential benefits of the Project.

In summary:

- The Project meets the definition of LDS (being energy storage that can be dispatched for a minimum of 8 hours) as it would be capable of producing 300 MW of power over 12 hours. It would therefore (subject to timely approvals) contribute to the NSW Government's legislated objective of constructing additional LDS:
  - AEMO has identified material electricity reliability shortfalls post-2024 due to the planned closure of coal-fired power stations (AEMO, 2023).
  - LDS is required to support the development of variable renewable energy (VRE) (e.g. solar and wind) to meet electricity supply reliability standards.
  - In recognition of this, the NSW Government has legislated an objective to construct 2 gigawatts (GW) of additional LDS by 2030.
  - Pumped hydro is recognised as the most established (DPIE, 2021b) and the lowest capital form of LDS (Graham et al., 2022).
- The Project's location has a number of strategic advantages, particularly when compared to greenfield and remote alternative pumped hydro locations, including:
  - Yancoal owns all private land required to develop the Project.
  - Topographic variation across the Project site provides sufficient elevation differences to support the PHES.
  - SMC mine voids hold sufficient licensed water stocks to supply the PHES.
  - Proximity to the existing TransGrid 132 kV ETL could avoid the need to establish new transmission easements.
  - The Project's location within and adjacent to an existing industrial complex (the existing SMC) minimises additional disturbance requirements.
  - Existing mining infrastructure can be repurposed and re-used for the Project.
  - The Project can be directly accessed by regional transport routes (The Bucketts Way) and population centres (including Newcastle and Gloucester).
  - Yancoal's landholdings, including the rehabilitated SMC, provide an opportunity to develop solar energy generation to provide a large portion (approximately 50%) of the energy required for the PHES.
- The Project represents a unique opportunity for beneficial PMLU, consistent with the NSW Government's *Practical guide: Post mining land use* (Department of Regional NSW, 2023) and the *Hunter Regional Plan 2041* (DPE, 2022e).
- It also represents an opportunity for ongoing post-mining economic and social benefits for the Gloucester region.

2.1 NSW RENEWABLE ENERGY POLICY

The *NSW Climate Change Policy Framework* (Office of Environment and Heritage [OEH], 2016) outlines an aspirational long-term objective of achieving net zero emissions by 2050. The NSW Government has introduced a suite of policies and legislation to achieve this objective.

Electricity generation is the largest source of greenhouse gas emissions in NSW. When considering this, a key focus of NSW's net zero policy and legislation relates to the decarbonisation of the electricity grid.

The net zero policy and legislation also recognise the need to maintain electricity supply reliability standards during the transition to renewable energy, given the inherent variability in energy supply sourced from solar and wind.

Key net zero policy and legislation include the introduction of the:

- *NSW Electricity Strategy* (DPIE, 2019);
- NSW *Electricity Infrastructure Roadmap* (DPIE, 2020a), which is underpinned by the NSW *Electricity Infrastructure Investment Act 2020* (EII Act); and
- NSW *Net Zero Plan Stage 1: 2020-2030* (DPIE, 2020b).

The NSW *Electricity Infrastructure Roadmap* and the EII Act are of most relevance to the strategic context for the Project, and are discussed further below.

2.1.1 ELECTRICITY INFRASTRUCTURE ROADMAP AND ELECTRICITY INFRASTRUCTURE INVESTMENT ACT

The NSW *Electricity Infrastructure Roadmap Electricity* and the EII Act outline the regulatory framework to coordinate investment in the transmission, generation, storage and firming infrastructure required to maintain reliability while decarbonising the NSW electricity grid.

Part 3 of the EII Act defines an Energy Security Target, which aims to achieve reliable electricity supply over the medium and long-term for NSW electricity consumers.

Part 6 of the EII Act sets out the NSW Government's minimum investment objectives for LDS for the period ending 31 December 2029, being the establishment of 2 GW of additional LDS capacity (i.e. over and above the existing Snowy 2.0 Project).

LDS is defined in the EII Act as storage that can be dispatched for a minimum duration of 8 hours.

Notwithstanding the objectives of the EII Act, AEMO (2023) currently projects reliability shortages in NSW in 2024, even when assuming all advanced and actionable projects are developed on schedule. AEMO (2022) highlights the need for more energy storage to prevent reliability shortages following the scheduled closure of the coal-fired Eraring Power Station (AEMO, 2022).

The Project would be capable of producing up to 300 MW of energy for 12 hours, and as such is classified as LDS under the EII Act.

If approved, the Project could contribute to the additional 2 GW of LDS legislated under the EII Act to be in place prior to 2030.

This would assist in addressing the electricity reliability shortages currently projected by AEMO.

2.2 STRATEGIC NEED FOR PUMPED HYDRO PROJECTS

Requirement for LDS

The NSW Government and AEMO have recognised the need for LDS to complement VRE such as solar and wind, which are dependent on climatic conditions to produce energy.

The *NSW Electricity Strategy* (DPIE, 2019) states (emphasis added):

> *Firmed renewables are the cheapest type of new reliable generation.*
>
> *Today, wind and solar are the cheapest forms of new electricity generation. These technologies are the most environmentally friendly.* ***When paired with batteries, pumped hydro or gas-fired generators, they can reliably supply electricity when the sun is not shining and the wind is not blowing, and are the lowest cost option to replace power stations as they close.***

LDS is able to produce energy on demand. This is particularly critical during the peak electricity demand periods of approximately 6.00 pm to 8.00 pm and 6.00 am to 8.00 am, which do not coincide with periods of peak utility-scale and rooftop solar energy generation.

Requirement for Pumped Hydro

The NSW Government has identified pumped hydro as the most established form of LDS, stating (DPIE, 2021b) (emphasis added):

> ***Pumped hydro is recognised as the most established form of long duration storage.*** *It provides large amounts of reliable electricity on demand by storing surplus renewable energy and releasing it into the grid when demand exceeds supply.*

Pumped hydro plants provide several essential ancillary services to the electricity grid, which help to maintain stability, reliability, and efficiency. Some of the key ancillary services provided by pumped hydro plants are:

- **Load balancing**: Pumped hydro plants can store excess electricity during periods of low demand by pumping water from a lower reservoir to an upper reservoir. During peak demand, the water is released back to the lower reservoir, generating electricity. This load balancing helps to manage fluctuations in electricity demand and supply, ensuring grid stability.
- **Frequency regulation**: Pumped hydro plants can respond quickly to changes in grid frequency by adjusting their generation or pumping capacity. This rapid response helps to maintain the grid's frequency within the required range, ensuring system stability and preventing potential blackouts.
- **Voltage regulation**: Pumped hydro plants can help to maintain voltage levels within the grid by adjusting their reactive power output. This voltage regulation is essential for the stable operation of transmission and distribution networks, reducing the risk of equipment damage and service interruptions.
- **Spinning reserve**: Pumped hydro plants can be kept in standby mode, ready to generate electricity at short notice if there is a sudden loss of power from other sources. This spinning reserve capability contributes to the grid's resilience and reliability in case of unexpected events or generator outages.
- **Black start capability**: Pumped hydro plants can often start without relying on the electricity grid, enabling them to provide critical support to restart the grid in the event of a complete system blackout.
- **Renewable energy integration**: Pumped hydro plants can help to integrate intermittent renewable energy sources, such as solar and wind, by storing excess generation during periods of high renewable output and releasing it when renewable generation is low. This storage capability allows for better utilisation of renewable resources and reduces the need for fossil fuel-based backup generation.

Pumped Hydro vs Alternative Forms of LDS

As identified in the *NSW Electricity Strategy* (DPIE, 2019), batteries can be an alternative form of LDS, and have advantages compared to pumped hydro in that their location is more flexible.

However, large-scale battery projects are typically designed to provide energy for shorter time periods relative to pumped hydro projects. For example, the Waratah Super Battery Project (SSI-48492458) proposes to produce up to 850 MW over approximately 2 hours, with an overall battery life of 20 years. By comparison, the PHES for the Project would be capable of producing power over a 12-hour period.

Modelling presented in the AEMO *New South Wales Development Pathways Report – December 2021* (AEMO, 2021) investigated feasibility of Battery Energy Storage System (BESS) technology as an alternative to pumped hydro. It found (emphasis added):

> ***In the modelling outcomes, pumped hydro generation was preferred over eight-hour battery storage considering the assumed levelised cost of each technology.*** *Despite having a higher outright capital cost, pumped hydro's longer technical and economic life (40 years compared to 20 years for battery storage) means pumped hydro is expected to have lower levelised cost and therefore require less additional revenue through LTES* [Long-term Electricity Supply] *Agreements.*

This aligns with the findings of the *GenCost 2022-23: Consultation draft* prepared by Commonwealth Scientific and Industrial Research Organisation (CSIRO) in collaboration with AEMO, which identifies pumped hydro as having the lowest capital cost on a per unit of power (e.g. MW) and per unit of energy (e.g. megawatt-hour [MWh]) basis (Graham et al, 2022).

Overall, the ancillary services provided by pumped hydro plants would play a crucial role in ensuring the reliable, stable, and efficient operation of the electricity grid.

Pumped Hydro Development Timeframes

Despite being identified as the lowest capital cost and most established form of LDS, pumped hydro projects are also recognised by the NSW Government and AEMO as having relatively long development lead-times. AEMO's *2021 Infrastructure Investment Objectives Report* states (AEMO Services, 2021) (emphasis added):

> ***The Development Pathway for long-duration storage is subject to a high degree of uncertainty in terms of technology readiness and cost****. The cost of long-duration batteries is expected to significantly decline in coming years, although the extent and the rate of the decline are uncertain. Other long-duration storage technologies may also emerge, but their path to commercialisation remains uncertain.*
>
> ***Additionally, it is not clear whether sufficient large-scale pumped hydro energy storage, which typically involves significant lead-times, will be able to be constructed quickly enough to meet the objectives…***

AEMO's modelling outlines the consequences to consumers associated with extended delays to the development of pumped hydro projects (AEMO, 2021):

> *… If pumped hydro developments were delayed, the modelling shows increased costs to consumers.*

The NSW Government has recognised the pivotal role of LDS and the long-lead nature of pumped hydro projects, and has therefore established the *NSW Pumped Hydro Recoverable Grants Program Guidelines*. It states (DPIE, 2021b) (emphasis added):

> [Pumped hydro] *Projects that participate in the Infrastructure Safeguard competitive processes for long duration storage LTESAs* [Long-term Energy Service Agreements] *could help mitigate the potential energy reliability and security shortfall projected in AEMO's 2020 ISP* [Integrated System Plan]. *However, these projects have bespoke design requirements, face long lead times, can take up to four years to develop and are capital intensive, which creates a high barrier to their development.*
>
> *To improve competition for LTESAs for long duration storage projects,* ***we have committed to deliver the Program to establish a pipeline of up to 3 GW pumped hydro projects*** *that can make competitive bids for LTESAs that have been developed to a stage where all approvals have been obtained, the construction contract value and financial/commercial model have been finalised and are ready to commence construction.*

The 3 GW "pipeline" of pumped hydro projects exceeds the legislated 2 GW of LDS under the EII Act. It is understood this is because it is unlikely that all proposed pumped hydro developments will progress to the development phase.

In this regard, project location will be a key factor influencing the ultimate viability of a pumped hydro project. The strategic benefits of the Project's location are discussed further below.

It is clear that pumped hydro projects, like the Project, will be required to meet the legislated LDS objectives of the EII Act.

The NSW Government has identified that, due to the complex nature and long lead times to develop pumped hydro projects, multiple projects will need to be advanced as it is unlikely all projects will progress to the development phase.

In this regard, the Project's location offers significant strategic advantages, particularly when compared to greenfield and/or remotely located pumped hydro projects.

The impending closure of the SMC means the site could transition to a renewable energy hub (i.e. the Project) in the near-term (subject to timely approvals).

2.3 PROJECT LOCATION

2.3.1 LAND OWNERSHIP

Yancoal landholdings purchased for the SMC (including buffer lands) are shown on Figure 4.

Yancoal owns all private land required to develop the PHES and the Solar Farm for the Project.

2.3.2 TOPOGRAPHY

Elevation differences between the upper and lower reservoirs of a pumped hydro development are fundamental to its feasibility.

The topographic variation across the Project site is shown on Figure 3. The natural variation in elevation between the upper reservoir and lower reservoir (approximately 150 metres [m] difference in vertical elevation) are sufficient to support a commercially viable PHES.

2.3.3 ACCESS TO STRATFORD MINING COMPLEX VOID WATER

The SMC is approved to leave residual voids in its final landform. These voids are predicted to contain water (due to groundwater inflows and incidental rainfall) in perpetuity and under all climatic scenarios (including periods of prolonged drought).

Water held in the void is licensed under the NSW *Water Management Act 2000* (WM Act) by licences held by Yancoal.

The void water is expected to be of poorer quality, and currently has no beneficial re-uses.

The Project would provide an opportunity to beneficially re-use void water for the initial filling of the PHES, and for ongoing top-up of the system to counter the losses due to evaporation during dry periods.

By comparison, other pumped hydro projects are reliant on diverting water from natural watercourses or water supply dams, which may have less reliable supply during drought periods.

2.3.4 PROXIMITY TO 132 KILOVOLT ELECTRICITY TRANSMISSION LINE

The proximity of the existing TransGrid 132 kV ETL to the Project provides an opportunity to directly connect to the grid.

Extensive new and upgraded transmission infrastructure is required across NSW (and other states) to support the broader decarbonisation of the grid. There has been recent community concern in regard to the construction of new transmission infrastructure.

Although upgrades to the existing 132 kV ETL are likely required to optimise the power exported from the Project (subject to separate approval), there is an opportunity for any such upgrades to occur within the existing TransGrid ETL easement.

By comparison, other pumped hydro projects (the locations of which will be determined by factors such as the availability of water resources and suitable variations in topography) may require lengthy new transmission lines to be constructed across private and public land.

2.3.5 ACCESS TO STRATFORD MINING COMPLEX INFRASTRUCTURE

Mining operations at the SMC commenced in 1995, and there will be continuous industrial use of the site until mining operations cease in 2024, followed by a period of rehabilitation.

Following the cessation of mining there will be mining infrastructure and previously disturbed mine areas available for repurposing for the Project. This includes:

- Ancillary infrastructure:
  - The mine access road off The Bucketts Way would provide access to the key Project construction areas via an existing purpose-built intersection.
  - Hardstand areas would be suitable for carparking and other uses for the Project.
  - Previously disturbed areas would be suitable for construction laydown areas.
  - Internal haul roads would provide access for construction equipment to access the lower reservoir and powerhouse site.
- Lower reservoir:
  - The existing SED would be augmented to create the lower reservoir for the Project.
- Previously disturbed mining areas:
  - Existing disturbance areas (in addition to other company owned land) have been targeted for the development of the Solar Farm for the Project.

The strategic benefits of repurposing of existing SMC infrastructure include reduced environmental impacts (e.g. disturbance and construction traffic) and lower capital costs for the Project (increasing its viability).

By comparison, other pumped hydro projects may require significant development in relatively pristine environments.

2.3.6 PROXIMITY TO REGIONAL TRANSPORT ROUTES AND POPULATIONS

The Project is located approximately 95 km north of Newcastle, 200 km north of Sydney and 10 km south of Gloucester.

Access to the Project site from the south is via the established M1 (Pacific Highway) and The Bucketts Way, a regional road that connects Gloucester to the Pacific Highway.

While the assessment of construction traffic impact would be a key matter in the EIS, it is of benefit that the Project could be accessed by existing State and regional road networks. By comparison, other pumped hydro projects, particularly those in remote location, may require significant road upgrades to facilitate construction.

In addition, the proximity of multiple regional towns and cities means that the construction workforce is likely to be sourced by personnel who reside in the broader region, avoiding the need for development of a construction accommodation camp.

2.4 BENEFICIAL POST-MINING LAND USE

The NSW Government has outlined its intention to promote and facilitate economic development in regional NSW via alternative PMLUs, in various policy documents.

Key actions in the NSW Government's *Strategic Statement on Coal Exploration and Mining in NSW* include (Department of Regional NSW, 2020):

- facilitating the beneficial uses of coal mining land once mining has ended; and
- supporting the diversification of coal-reliant regional economies, including developing and implementing location-specific plans to diversify the regional economies that are heavily dependent on coal mining.

In June 2023, the NSW Government released the *Practical guide: Post-mining land use* (Department of Regional NSW, 2023), designed to "*assist and encourage mining lease holders to explore opportunities for alternative and innovate PMLUs for mine sites"*.

The *Practical guide: Post-mining land use* identifies energy generation as a key opportunity for alternative PMLU.

Similarly, the *Hunter Regional Plan 2041* (which is relevant to the Project location) identifies the region is seeking to maximise opportunities resulting from mine closure to attract investment in alternative industries (DPE, 2022e).

More specifically, the *Hunter Regional Plan 2041* states:

> *The Stratford and Duralie mines near Gloucester provide potential re-use opportunities over the 20-year period of this plan. Existing hard stand areas, vehicular access and transmission lines could support renewable energy and batteries. Other uses like recreation, industrial or intensive agriculture uses could also be suitable.*

The Project is entirely consistent with the intent of the *Strategic Statement on Coal Exploration and Mining in NSW*, *Practical guide: Post-mining land use* and *Hunter Regional Plan 2041* in regard to the beneficial use of the SMC land, and the associated economic opportunities the Project would provide to the region following the completion of mining operations.

The Project aligns with NSW Government intentions to facilitate beneficial use of mining land to attract investment in new industries following the completion of mining operations.

If approved, the Project could be a model case study for beneficial post-mining land use.

2.5 KEY NATURAL AND BUILT FEATURES OF THE SITE AND SURROUNDS

A preliminary assessment of environmentally sensitive areas of State Significance has been undertaken as per Chapter 2 of the NSW *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). It identified that the Project is **not** associated with:

- Coastal wetlands or littoral rainforest within the meaning of the NSW *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP).
- Coastal waters of the State.
- Land reserved as an aquatic reserve under the NSW *Fisheries Management Act 1994* or as a marine park under the NSW *Marine Parks Act 1997*.
- Land declared as a Ramsar wetland within the meaning of the EPBC Act.

- Land declared a World Heritage property within the meaning of the EPBC Act.
- Land identified in an environmental planning instrument as being of high Aboriginal cultural significance or high biodiversity significance.
- Land reserved as a state conservation area under the NSW *National Parks and Wildlife Act 1974*.
- Places, buildings or structures listed on the State Heritage Register under the NSW *Heritage Act 1977*.
- Land reserved or dedicated under the NSW *Crown Land Management Act 2016* for the preservation of flora, fauna, geological formations or for other environmental protection purposes.
- Land identified as being critical habitat under the NSW *Threatened Species Conservation Act 1995* or Part 7A of the NSW *Fisheries Management Act 1994*.

2.6 KEY RISKS AND HAZARDS

A preliminary hazard analysis will be undertaken for the Project, which will consider risks including those associated with:

- bushfire;
- dam safety;
- flooding; and
- land contamination.

2.7 CUMULATIVE IMPACTS

Baseline data collected and analysed for the EIS will consider the contribution of any existing and proposed developments. Noting that there are currently no other proposed state significant developments or modifications in the MidCoast LGA.

The SMC (and Duralie Coal Mine) will be undergoing closure works in parallel with the construction and operation of the Project. This will involve decommissioning of existing mining infrastructure, shaping of final landforms and rehabilitation activities including revegetation. A small fleet of mining/construction equipment will be required to implement the closure works, however, the overall intensity of activity during the closure phase will be significantly less than what has occurred during mining.

The impact of closure works will be considered cumulatively with the Project in the EIS, particularly during the Project construction phase. However, impacts from the relatively low-intensity closure works are expected to be minor.

Upgrades to the existing 132 kV ETL between the Project site and the Stroud Road substation (which would be subject to separate approval) will also be considered cumulatively with the Project in the EIS.

Attachment A provides a summary of how existing, proposed and potential developments will be considered cumulatively for the Project in the EIS.

2.8 THIRD-PARTY AGREEMENTS

It is expected that, should the Project be approved and developed, the Project would seek to enter into the third-party agreements with the following:

- TransGrid: Agreement to facilitate access to its transmission network.
- MidCoast Council: Planning Agreement.

3 PROJECT DESCRIPTION

Pumped hydro involves two reservoirs (upper and lower) with elevation differences. Electricity is generated by releasing water stored in the upper reservoir to the lower reservoir via a turbine system. This typically occurs during peak evening and morning periods, particularly as there is less solar power available during these times.

Water then needs to be pumped back to the upper reservoir. This typically occurs during the daytime, when there is more abundant solar energy available and lower electricity demand.

The Project includes an on-site Solar Farm, which has been designed to match the peak power requirements of the PHES and approximately 50% of total energy required to pump the water back up to the upper reservoir.

The Project comprises a PHES with a capacity of 3.6 GWh (300 MW over 12 hours), as well as a Solar Farm and supporting infrastructure.

The final Project description to be included in the EIS will be informed by the outcomes of environmental assessment and stakeholder engagement.

It is expected the Project would include the following:

- Construction of an upper reservoir.
- Construction of a tunnelled waterway comprising a vertical shaft and inclined headrace tunnel between the upper reservoir intake and powerhouse, and a tailrace tunnel connecting the powerhouse to the lower reservoir.
- Augmentation of the existing SED to serve as the lower reservoir.
- Construction and operation of a “behind the meter” Solar Farm to supply up to 330 MW to the PHES, with optionality to export electricity to the grid in times of surplus solar generation.
- Re-alignment of the existing ETL across previously disturbed mine areas.
- Construction of an on-site electrical substation, to connect the PHES and the Solar Farm to the TransGrid ETL.
- Minor works in the public road network, such as intersection upgrades and installation of ETL.
- Other associated construction and operational activities.

3.1 STUDY AREA

The indicative Study Area is shown in Figure 3. The Study Area sets out an initial Project extent to guide environmental assessments. This extent will be refined during preparation of the EIS to form the final Project disturbance footprint. The key components in the indicative Study Area include:

- Upper reservoir.
- Powerhouse area.
- Lower reservoir (at the location of the existing SED).
- Solar Farm.
- Electrical substation.
- Relocated existing 132 kV ETL around the powerhouse and lower reservoir.
- Upgraded access roads to the upper reservoir.
- Existing and new internal roads and infrastructure corridors to be used for the Project, particularly to connect the Solar Farm to the electrical substation.
- Indicative locations of enhanced or new vegetation screens along The Bucketts Way.

Other ancillary infrastructure required for the Project, such as offices, carparks, laydown areas and water treatment facilities, would be located within the extent of the Study Area and/or final EIS disturbance footprint.

Water stored in existing SMC voids would be used to supply the PHES. Some of the existing SMC voids would also be used to emplace excess spoil material from the Project (e.g. from the tunnel and powerhouse excavations). These voids do not currently form part of the Study Area.

The Project is located within and adjacent to land associated with the existing Stratford Mining Complex.

The Study Area has been designed to maximise the use of previously disturbed areas to minimise new disturbance, and avoid/minimise disturbance to areas with higher environmental value such as existing biodiversity offset areas and habitat enhancement areas associated with the rehabilitated SMC.

The current indicative Project general arrangement area of approximately 685 ha comprises:

- Approximately 325 ha (47%) within the currently approved SMC disturbance footprint; and
- Approximately 360 ha (53%) outside the currently approved SMC disturbance footprint.

For the area of indicative Project general arrangement that is outside the currently approved SMC disturbance footprint (360 ha):

- Approximately 250 ha (69%) is exotic pasture; and
- Approximately 110 ha (31%) is native vegetation.

The final Project disturbance footprint will be confirmed following the completion of environmental studies and described in the EIS.

Table 1 provides a preliminary summary description of the Project.

3.2 CONCEPTUAL LAYOUT

A preliminary conceptual layout of the Project is shown in Figure 5.

The conceptual layout will be refined in the EIS in consideration of the outcomes of the Project Feasibility Study, environmental constraints and stakeholder feedback.

3.3 INDICATIVE DEVELOPMENT SCHEDULE

An indicative construction schedule is provided in Figure 6, focussing on the currently assumed sequence of construction.

The overall construction period is anticipated to take approximately 4 years. Construction would commence as soon as all relevant regulatory approvals are in place and a final investment decision on the Project has been made. For the purposes of assessment, it is assumed that construction would commence in 2025.

3.4 PROJECT VARIABILITY

The Project EIS would assess the full development of the Project. This would include consideration of the maximum disturbance area required for the Project, peak vehicle movements required for construction, peak material handling rates during construction and maximum energy generation and consumption from the PHES and the Solar Farm.

While the EIS and any subsequent approval would define peak limits for some aspects of the Project (e.g. disturbance areas), the ability for flexibility in final design and operation of the Project would be sought, such as:

- Micro-siting infrastructure within the assessed disturbance footprint.
- Specific location and dimensions of the waterway tunnels (noting this would necessarily follow the general alignment shown on Figure 5 between the upper reservoir, powerhouse and lower reservoir).
- Dimensions of the upper and lower reservoirs, within the constraint of the overall assessed inundation footprints.
- Final power output of the PHES and the Solar Farms, noting this is influenced by broader constraints on the NSW transmission network.
- Infrastructure sizing, such as pumps/turbines.
- Specific workforce numbers.

3.5 ALTERNATIVES CONSIDERED

The strategic justification for the Project is considered in Section 2.

Consequences of Not Proceeding with the Project

The consequences of not proceeding with the Project include:

- The Project would not contribute to the decarbonisation of NSW's electricity network.
- The Project would not be available to provide LDS, particularly during periods when VREs are not sufficient to meet consumer demands.

Table 1
Preliminary Summary Description of the Project

Project Characteristic		Description
Study Area		
Location		• The Project is within and adjacent to land associated with the existing SMC, located in the Gloucester Valley, approximately 95 km north of Newcastle in the NSW MidCoast LGA. • All private land required to develop the PHES and the Solar Farm is owned by Yancoal for the SMC. • Access tracks and ETL connections may intersect Council and/or Crown land.
Zoning / Land Use		The Project's development footprint is proposed to occur on lands zoned under the Gloucester Local Environmental Plan (LEP) as: • Zone RU1 – Primary Production Zone; and • Zone IN3 – Heavy Industrial Zone.
Summary of Operational Project Components		
• The proposed SREH is an integrated PHES and Solar Farm facility. • The PHES output would be up to 300 MW over a 12-hour period. To recharge the PHES, a 330 MW DC Solar Farm would provide up to approximately 50% of the energy required to pump the water from the lower reservoir to the upper reservoir.		
PHES	**Upper Reservoir**	• Full supply level (FSL) at approximately 390.5 metres Australian Height Datum (m AHD). • Minimum operating level (MOL) at approximately 350.0 m AHD. • Total storage volume of approximately 8.2 gigalitres (GL). • Active storage transferred between the upper and lower reservoirs during generation and pumping of approximately 6.95 GL. • Spillway level at approximately 391.0 m AHD. • Freeboard height of approximately 0.5 m. • Low level outlet constructed to meet dam safety requirements. • Grouting or equivalent at the base of reservoir to achieve permeability standard.
	Lower Reservoir	• Zone embankment with an upstream sloping clay core. • FSL at approximately 166.7 m AHD. • MOL at approximately 150.0 m AHD. • Total storage volume of approximately 7.1 GL. • Active storage transferred between the upper and lower reservoirs during generation and pumping of approximately 6.95 GL. • Freeboard height of approximately 0.9 m. • Construction of up-catchment diversion system to prevent upslope runoff reporting to the reservoir.

Table 1 (Continued)
Preliminary Summary Description of the Project

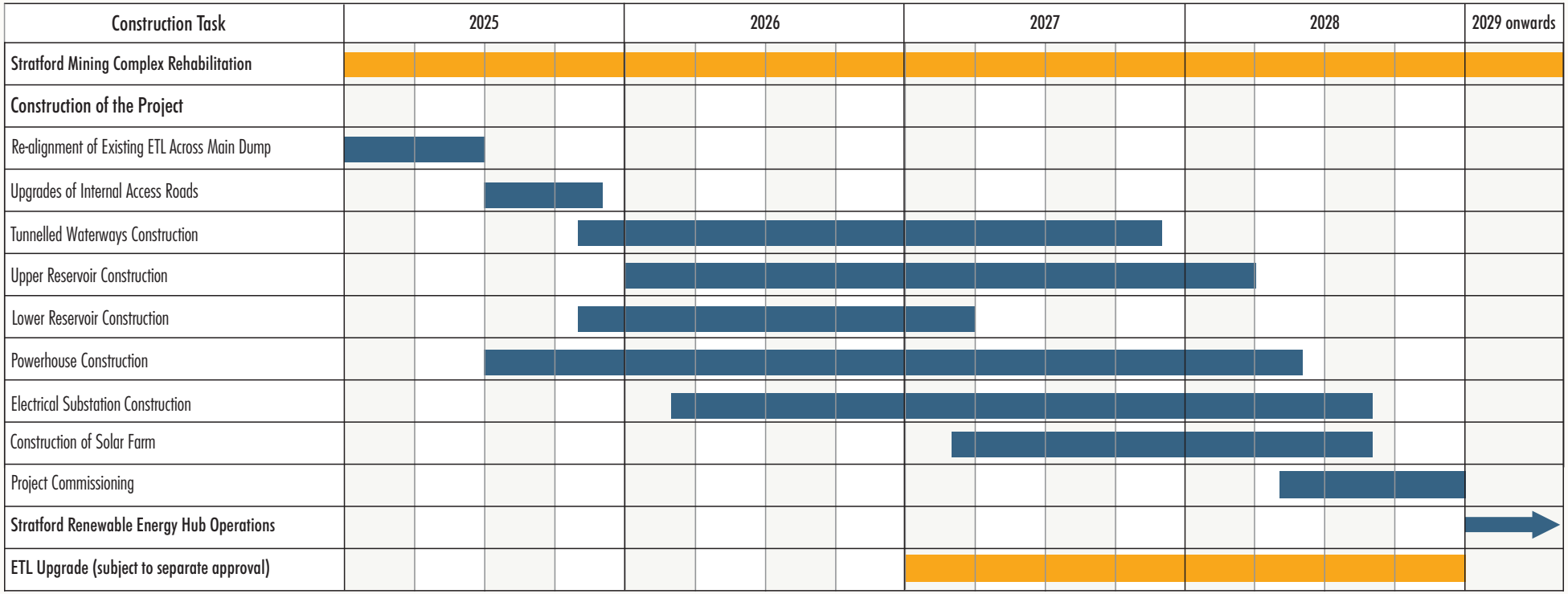
Project Characteristic		Description
Summary of Operational Project Components		
PHES	**Powerhouse and Assembly Bay**	• Serves to pump water from the lower reservoir to the upper reservoir, and to generate electricity during higher price periods (generally higher demand). • Contains two 150 MW reversible pump / turbine units. • Silo structure at a depth of approximately 100 m, with a diameter of approximately 32 m. • Turbines generating up to 300 MW over a 12-hour period (3.6 GWh energy storage capacity). • Requires approximately 330 MW and a total of approximately 4 GWh to pump to recharge PHES.
	Headrace	• The headrace connects the upper reservoir to the powerhouse. • Comprises an approximate 50 m vertical shaft from the upper reservoir intake transitioning to an inclined tunnel to the powerhouse. • The vertical shaft and first approximate 840 m of the inclined tunnel would be concrete lined with an approximate 6.5 m internal diameter. It would then transition to an approximate 4.9 m internal diameter steel lined tunnel for the remaining approximate 400 m to the powerhouse.
	Tailrace	• The tailrace serves to connect the powerhouse to the lower reservoir. • Comprises an approximate 190 m low-pressure tailrace tunnel with a diameter of approximately 7 m. • Comprises two approximate 60 m steel-lined draft tubes with a diameter of approximately 5.3 m.
	Tunnel Construction Methodology	• The tunnel would be constructed via drilling and blasting, rather than via a tunnel boring machine. • Temporary ground support would initially be installed, including rockbolts and shotcrete. • Permanent tunnel lining and waterproofing would be installed, using concrete and steel.
	Upper and Lower Intake/Outlet Structures	• The upper and lower intake/outlet structures control the flow of water between reservoirs, and prevent debris or air from entering the pump/turbine units. • Includes stop-log slots and screens.
	Electrical Distribution	• Internal distribution of electricity from the PHES powerhouse would be via an above ground distribution network to the Electrical Substation.
	Water Supply	• Initial fill and top-up water sourced from SMC residual mining voids. • Transfer via approximately 500 millimetres (mm) diameter pipeline between Stratford Main Void and lower reservoir, with associated pumps.

Table 1 (Continued)
Preliminary Summary Description of the Project

Project Characteristic	Description	
Summary of Operational Project Components		
Solar Farm	• The Solar Farm could generate up to 330 MW DC electricity, to approximately match the peak energy demands to pump water from the lower reservoir to the upper reservoir. • Power generated from the Solar Farm that is in excess of the PHES power demands could be exported to the grid. • Fixed tilt or single axis tracking system (subject to the outcomes of the Feasibility Study). • Internal distribution of electricity via an above ground distribution network connecting to the Electrical Substation. • Construction of new traffic access points to connect the Solar Farm areas with the public road network.	
Electrical Substation	• Located proximal to the lower reservoir. • Incoming electrical feeders from the PHES and the Solar Farm and step-up transfers. • Outgoing electrical feeders to the 132 kV network.	
Ancillary Infrastructure	**Site Facilities**	• The new powerhouse would incorporate an office, workshop and stores to service PHES operations. • It is anticipated that other existing SMC facilities would be repurposed to provide facilities for the Solar Farm.
	Access Roads and Parking	• Site access from the existing the SMC site entrance. • Where possible, internal SMC haul roads would be repurposed to provide access to the lower reservoir and PHES, with upgrades as required. • Existing tracks between the lower reservoir and upper reservoir would be upgraded to provide two-way road access to the upper reservoir for construction and operations where possible. The inundation area of the upper reservoir would be used to house a temporary laydown area and construction facilities. • Gravel for roads would be sourced from on-site borrow pits where possible, some additional material may be imported. • Additional construction access to solar areas.
Workforce	• Approximately 10 Full-Time Equivalent (FTE) workers would be required during normal operations. • This would increase to approximately 30 FTE workers during periodic maintenance activities.	
Operational Life Expectancy	• Solar panels have a life expectancy of approximately 25 years, and would be replaced as required.	
Hours of Operation	• The Project would operate on a 24-hour basis over its operational life expectancy. • Pumping cycles would be optimised on a daily basis to maximise power supply to the grid during periods of high electricity demand from consumers (i.e. evening, night and early morning periods), and maximise power consumption from the Solar Farm and the grid during periods of lower demand from other consumers and maximum output from other utility scale and rooftop solar operations (i.e. daytime period).	

Table 1 (Continued)
Preliminary Summary Description of the Project

Project Characteristic	Description
Construction	
Key Construction Materials for PHES	• Construction materials for the upper and lower dam walls would preferentially be sourced from on-site borrow pits, along with excavation material from the headrace and tailrace. • An on-site concrete batching plant and crushing station would be used to provide concrete for the works. • Importation of some construction materials, such as steel, where required.
Spoil Management	• Excess spoil material would be transported to existing mine voids via truck.
Workforce	• It is anticipated that an average of 300 FTE workers would be required over a period of around 48 months, with a peak of approximately 350 FTE workers.
Hours of operation	• Major earthworks would occur during daytime construction hours (7.00 am to 6.00 pm), 7 days per week. • Tunnelling activities would occur up to 24 hours, 7 days per week.
Indicative Construction Schedule	• Refer to indicative construction schedule provided in Figure 6.
Project Rehabilitation	
Decommissioning and Rehabilitation	• If no longer required, the PHES and the Solar Farm would be decommissioned. • The proponent would be responsible for achieving a final landform that is safe, stable and non-polluting. • Infrastructure and materials would be beneficially re-used wherever possible, with excess waste material disposed in a licensed or approved location. • Water stored in the PHES would either be beneficially re-used, suitably treated and released and/or returned to the SMC residual voids.



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YANCOAL - STRATFORD RENEWABLE ENERGY HUB

Indicative Construction Schedule

Figure 6

- The requirement to satisfy LDS requirements identified by the NSW Government and AEMO would need to be met by large scale batteries and/or alternative pumped hydro projects in more remote locations, with greater potential environment impacts.
- The economic and social benefits of further investment in the Gloucester Valley would not be realised.

PHES Location and Power Output

There is limited flexibility in the location of the PHES, given its location is determined and constrained by topography. Similarly, the designed energy output of the PHES (3.6 GWh) is limited by the available water storage capacity of the upper reservoir, which is constrained by the topography of the upper reservoir area.

A PHES comprising the use of an existing mine void as the lower reservoir and the augmented SED as the upper reservoir was considered. However, as the existing mine voids are predicted to fill with water due to groundwater inflow and incidental rainfall, this would limit the required elevation difference between the upper reservoir and lower reservoir.

The Project is able to make use of the existing SED for the lower reservoir, and so use of an existing mine void in the PHES was not considered further.

Solar Farm

The Solar Farm has been designed to match the peak power demand of the PHES (approximately 330 MW to pump water from the lower reservoir to the upper reservoir).

However, as the upper reservoir may take up to approximately 12 hours to fill (if depleted to its operational maximum), whereas peak power output from the Solar Farm may only occur for an average of 6 hours per day, the Solar Farm would provide on average approximately 50% of the energy required to completely fill the upper reservoir.

The area required to achieve 330 MW of solar energy is based on the typical MW generated per hectare (ha) (i.e. approximately 2 ha/MW) of solar for the current generation of utility scale solar panels.

The indicative area of the Solar Farm shown on Figure 5 achieves approximately 330 MW of electricity output. The Solar Farm would be developed on areas disturbed as part of SMC operations as well as on other Yancoal-owned land. Other constraints considered in the development of the indicative area of the Solar Farm include avoiding SMC offset areas and biodiversity enhancement areas.

Areas beyond the existing SMC disturbance area are required to achieve the total 330 MW output of the Solar Farm.

Consideration was given to reduce the design capacity of the solar farm (i.e. below 330 MW). However, any solar not developed for the Project would lead to the input of energy produced elsewhere, which would likely be from solar.

Replacement of solar developments, and any associated requirement to develop new transmission, may have similar or greater impacts than the Project.

Accordingly, the Project currently proposes the development of a Solar Farm with design capacity of 330 MW within the indicative Study Area. Refinements to the Solar Farm areas may be identified for the EIS.

4 STATUTORY CONTEXT

This section summarises the planning framework and statutory context relevant to the assessment of the Project.

Clause 20, Schedule 1 of the Planning Systems SEPP states that development for the purpose of electricity generating works with a capital investment value of greater than $30 million is SSD. Accordingly, by default the Project would be SSD.

In September 2023, Yancoal requested the Project be declared CSSI (consistent with other pumped hydro projects in NSW).

Under section 5.12 of the EP&A Act, any development, or class of development, may be declared as SSI by a State environment planning policy (SEPP). Section 5.13 of the EP&A Act states that any SSI may also be declared to be CSSI if it is of a category that, in the opinion of the NSW Minister for Planning, is essential for the State for economic, environmental or social reasons.

The Project clearly satisfies the NSW Government's requirements for CSSI as it addresses "*emerging resource shortages … or critical supply/demand imbalances*" (DPIE, 2021a), namely the need for LDS in the energy sector to address imminent electricity reliability shortfalls identified by AEMO.

If the NSW Minister for Planning were to declare the Project, or a class of development that is relevant to the Project (e.g. pumped hydro/LDS projects of a certain size or capital investment value), to be SSI and/or CSSI then the Project would require assessment and approval under Part 5 of the EP&A Act.

Section 5.22 of the EP&A Act states that Part 4 of the EP&A Act and Environmental Planning Instruments (EPIs) do not apply to SSI beyond the declaration of the Project (or declaration of a class of development as SSI/CSSI that is relevant to the Project):

> *(1) Part 4 and Division 5.1 do not, except as provided by this Division, apply to or in respect of State significant infrastructure (including the declaration of the infrastructure as State significant infrastructure and any approval or other requirement under this Division for the infrastructure).*
>
> *(2) Part 3 and environmental planning instruments do not apply to or in respect of State significant infrastructure, except that—*
>
> *(a) they apply to the declaration of infrastructure as State significant infrastructure or as critical State significant infrastructure (and to the declaration of development that does not require consent), and*
>
> *(b) they apply in so far as they relate to section 3.16, and for that purpose a reference in that section to enabling development to be carried out in accordance with an environmental planning instrument or in accordance with a consent granted under this Act is to be construed as a reference to enabling State significant infrastructure to be carried out in accordance with an approval granted under this Division.*

Accordingly, if the Project were SSI or CSSI, Part 4 of the EP&A Act and EPIs would not apply to the Project.

As the Project is currently SSD by default, the remainder of Section 4 of this Scoping Report generally describes the statutory context of the Project on the basis that it is SSD, with commentary where relevant regarding the scenario where the Project is SSI or CSSI.

4.1 POWER TO GRANT CONSENT

4.1.1 APPLICABILITY OF PART 4 AND PART 5 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Division 4.1 of the EP&A Act creates a threefold classification of development, being:

- development that does not need consent;
- development that needs consent; and
- development that is prohibited.

As SSD, the Project falls into the classification of development that may be carried out with Development Consent under Part 4 of the EP&A Act.

If the Project were SSI or CSSI, an Infrastructure Approval for the Project would be required under Part 5 of the EP&A Act.

4.2 PERMISSIBILITY

The Study Area is located wholly within the MidCoast LGA, and in an area regulated under the Gloucester LEP.

Clause 2.3(2) of the Gloucester LEP states that:

> *The consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within the zone.*

The provisional Development Application Area includes land zoned under the Gloucester LEP as (Figure 7):

- Zone RU1 (Primary Production Zone); and
- Zone IN3 (Heavy Industrial Zone).

The Project has been designed to avoid the area zoned as C3 (Environment Management Zone) on Yancoal-owned land that runs parallel to The Bucketts Way.

Electricity generation and storage is not listed as permissible development for land zones RU1 and IN3 under the Gloucester LEP, and this development would therefore be prohibited under the LEP if not for SSD, SSI or CSSI; and where relevant, the provisions of the SEPPs.

Division 4, section 2.36 of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) states:

> *(1) Development for the purpose of electricity generating works may be carried out by any person with consent on the following land—*
>
> *(a) in the case of electricity generating works comprising a building or place used for the purpose of making or generating electricity using waves, tides or aquatic thermal as the relevant fuel source—on any land.*
>
> *(b) in any other case—any land in a prescribed non-residential zone.*

Zones RU1 and IN3 are "*prescribed non-residential zones"* under the Transport and Infrastructure SEPP, and the Gloucester LEP acknowledges it is subject to the provisions of any SEPP that prevails over it, including the Transport and Infrastructure SEPP.

As SSD, the Project is therefore permissible with consent on land zoned RU1 and IN3.

If the Project is SSI or CSSI, EPIs including the Gloucester LEP would not apply as per section 5.22(2) of the EP&A Act, meaning the infrastructure would not be prohibited by any EPI.

4.3 PLANNING PROVISIONS

The application of the following SEPPs would be considered in the EIS for the Project:

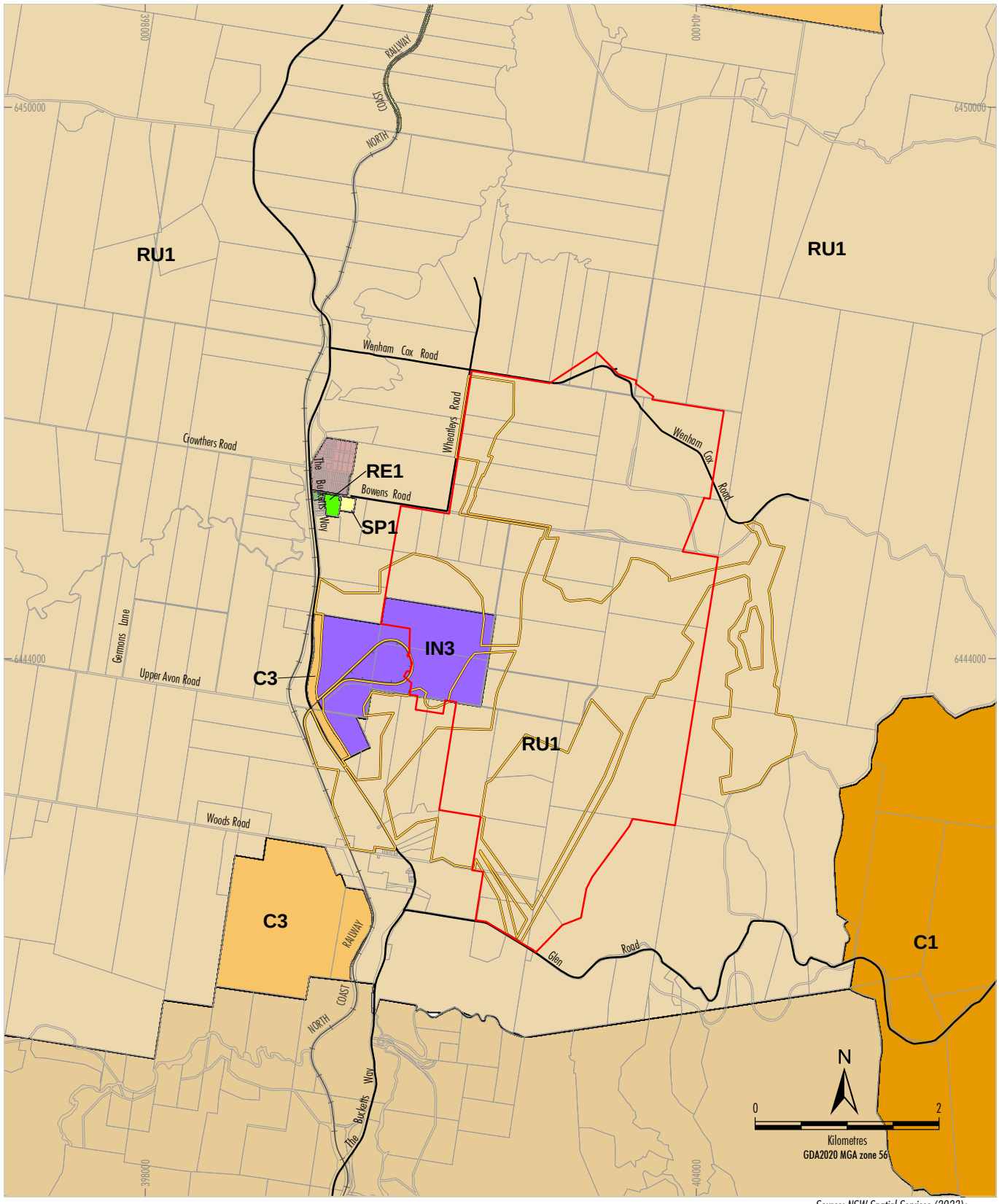
- NSW *State Environmental Planning Policy (Precincts—Regional) 2021* (Precincts-Regional SEPP)*;*
- Resilience and Hazards SEPP;
- Transport and Infrastructure SEPP;
- Planning Systems SEPP; and
- NSW *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP).

Further consideration of requirements under these SEPPs that may be of relevance to the Project is provided in Section 4.7.

4.4 PLANNING STRATEGIES

Strategic planning documents and EPIs will be considered in preparation of the EIS, including:

- *NSW Climate Change Policy Framework* (OEH, 2016);
- *Hunter Regional Plan 2041* (DPE, 2022e);
- NSW *Net Zero Plan – Stage 1: 2020-2030* (DPIE, 2020b);
- Gloucester LEP;
- *NSW Transmission Infrastructure Strategy* (DPE, 2018);
- *NSW Pumped Hydro Recoverable Grants Program Guidelines* (DPIE, 2021b);
- Gloucester *Development Control Plan* (Gloucester Shire Council, 2010);
- NSW *State Infrastructure Strategy 2022-2042* (Infrastructure NSW, 2022); and
- *NSW Electricity Strategy* (DPIE, 2019).



YAN-22-45 SREH2020_SR_205A

LEGEND

Mining Tenure

Preliminary EIS Study Area

Local Land Zoning

- National Parks and Nature Reserves (C1)
- Environmental Management (C3)
- Heavy Industrial (IN3)
- Public Recreation (RE1)
- Primary Production (RU1)
- Rural Landscape (RU2)
- Village (RU5)
- Special Activities (SP1)

Source: NSW Spatial Services (2023); State Government of NSW and Department of Planning and Environment 2023

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Local Land Zoning

Figure 7

4.5 OTHER NSW APPROVALS

4.5.1 EXEMPT APPROVALS

Under section 4.41 of the EP&A Act, the following approvals are not required for SSD:

(a) (Repealed)

(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,

(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,

(d) an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,

(e) (Repealed)

(f) a bush fire safety authority under section 100B of the Rural Fires Act 1997,

(g) a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the Water Management Act 2000.

The same list of approvals from section 4.41 (a) to (g) of the EP&A Act are not required for SSI or CSSI, as per section 5.23 of the EP&A Act.

Notwithstanding, the relevance of the approvals and legislation listed above to the Project (if not for sections 4.41 and 5.23 of the EP&A Act) would be considered in the EIS.

4.5.2 APPROVALS THAT MUST BE APPLIED CONSISTENTLY

Approvals of the kind listed below, which are of relevance to the Project, cannot be refused if they are necessary for carrying out approved SSD as per section 4.42(1) of the EP&A Act:

…

(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),

(f) a consent under section 138 of the Roads Act 1993,

…

These approvals must also be granted in a manner that is substantially the same as the SSD Development Consent.

Similarly, the approvals listed above cannot be refused for approved SSI or CSSI projects, and must be substantially the same as the SSI/CSSI Infrastructure Approval.

4.5.3 BIODIVERSITY CONSERVATION ACT 2016

Section 1.7 of the EP&A Act states that the EP&A Act has effect subject to the provisions of Part 7 of the BC Act.

Section 7.9 of the BC Act states that an EIS for a project declared SSD or SSI is to be "*accompanied by a biodiversity development assessment report* [BDAR] *unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values."*

A BDAR will be prepared for the Project in accordance with the BC Act.

4.5.4 WATER MANAGEMENT ACT 2000

Section 60A of the WM Act states that it is an offence to take water from a water source without holding a water access licence (WAL).

However, clause 21(1) of the NSW *Water Management (General) Regulation 2018* states:

(1) A person is exempt from section 60A(1) and (2) of the Act in relation to the taking of water from a water source if the person—

(a) is specified in any provision of Part 1 of Schedule 4, and

(b) takes water for any of the purposes, and in the circumstances, specified in that provision.

Schedule 4 of the NSW *Water Management (General) Regulation 2018* lists access licence exemptions. In regard to pumped hydro, it states the following is exempt from requiring a water access licence:

11A Interchange of water in pumped hydro-electricity generation schemes

(1) A person lawfully engaged in the operation of a pumped hydro-electricity generation scheme—for water moved between storages in the scheme.

(2) This clause applies only to water originally taken under—

(a) an access licence, or

(b) a basic landholder right.

It is noted that water held in the Stratford Main Pit is proposed to be used to fill the PHES. This water is already licensed via WALs held by Yancoal for the SMC mining operations.

The EIS will outline the WAL requirements for each relevant water source for the Project, particularly for water originally taken to operate the pumped hydro project. These licensing requirements will be compared to licenses already held by Yancoal.

4.5.5 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The NSW *Protection of the Environment Operations Act 1997* (PoEO Act) and the NSW *Protection of the Environment Operations (General) Regulation 2022* set out the general obligations for environmental regulation in NSW.

Schedule 1 of the PoEO Act defines general electricity works as *"generation of electricity by means of electricity plant that, wherever situated, is based on, or uses, any energy source other than wind power or solar power".* To be a scheduled activity, the general electricity works must generate more than 30 MW of electrical power. The Project will exceed this limit and will therefore be a scheduled activity, requiring an Environmental Protection License (EPL) prior to commencing construction.

As above, an EPL cannot be refused if it is necessary for carrying out approved SSD, SSI or CSSI.

4.5.6 ROADS ACT 1993

The Project is likely to require works in the public road network, including a new access point on the western side of The Bucketts Way for construction access to a portion of the Solar Farm, and potential upgrades to portions of Wenham Cox Road (eastern end) and Wheatleys Road.

Consent under section 138 of the NSW *Roads Act 1993* is required for works in the public road network.

As above, an approval under section 138 of the NSW *Roads Act 1993* cannot be refused if it is necessary for carrying out approved SSD, SSI or CSSI.

4.6 COMMONWEALTH ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The Project may require approval under the EPBC Act if the Commonwealth Minister considers the Project is likely to have a significant impact on Matters of National Environmental Significance (MNES).

MNES that may be relevant to the Project include listed threatened species and communities and listed migratory species.

Yancoal will refer the Project to the Commonwealth Minister under the EPBC Act.

4.7 PRE-CONDITIONS TO EXERCISING THE POWER TO GRANT CONSENT AND MANDATORY MATTERS FOR CONSIDERATION

Relevant pre-conditions to the consent authority exercising its power to grant consent, and matters that the consent authority is required to consider in deciding whether to grant approval for the Project, are presented in Attachment B.

5 COMMUNITY ENGAGEMENT

5.1 ENGAGEMENT DURING PROJECT SCOPING

Yancoal engages regularly with the community through the following mechanisms:

- a webpage on the Stratford Coal website dedicated to the progression of the SREH (https://www.stratfordcoal.com.au/page/SREH/);
- release of SREH fact sheets available online (Attachments C); and
- community and one-to-one meetings.

To date, consultation in relation to the Project which has assisted to inform the preparation of this Scoping Report includes consultation with:

- EnergyCo;
- Regional NSW;
- NSW Mining, Exploration and Geoscience (MEG);
- NSW Resources Regulator;
- TransGrid;
- MidCoast Council;
- Hunter Regional Expert Panel;
- Stratford and Duralie Mine Community Consultative Committees (CCC);
- Regional Development Australia Mid-North Coast;
- Department of Climate Change, Energy, the Environment and Water (DCCEEW);
- local businesses;
- local community groups/organisations;
- Aboriginal community;
- Stratford and Duralie workforces; and
- local land owners.

Given the Project's purpose is to assist with decarbonising the electricity grid, generally positive feedback has been received to date. Other positive feedback has related to potential ongoing investment and employment in the region, and beneficial use of the SMC land.

No feedback has been received from the Government agencies or the Council that has necessitated changes to the Project scope or design.

Community Engagement

The Stratford and Duralie Mine CCC provide a forum for consultation with the community on the operation of the mine developments. The CCC are long-established, and comprise representatives from the community, Council and business groups.

The CCC were briefed in regard to the Project as a potential post mining land use in February, May and August 2023.

While there has not been any specific feedback that has necessitated changes to the Project to date, the location of the Solar Farm, including its proximity to dwellings and sterilisation of agricultural land was raised. These matters will be considered further in the EIS, noting the Project will continue to be refined during the preparation of the EIS and in consideration of ongoing consultation with stakeholders.

Aboriginal Community Engagement

Consultation with the Aboriginal community regarding the Project has commenced.

To date the consultation process has involved:

- Request for expressions of interest for groups/individuals to register as a Registered Aboriginal Party (RAP) for the Project, in consultation with the relevant Local Aboriginal Land Council and Heritage NSW.
- Automatic registration of existing RAPs for the Stratford and Duralie Mines.
- Provision of the Proposed Methodology for the Aboriginal Cultural Heritage Assessment (ACHA) archaeological field surveys and reporting process.
- Requests for feedback regarding interest in participating in archaeological field surveys.
- Information Session held on-site and online on 2 November 2023 with representation by RAPs, the archaeologist consultant and Yancoal.

Consultation with the RAPs will continue during the preparation of the ACHA, and during development of the Project EIS.

No feedback has been received from the RAPs to date that is relevant to the design of the Project. Feedback regarding cultural values, survey outcomes and any management, monitoring and mitigation requirements will be documented in the ACHA.

5.2 PROPOSED ENGAGEMENT PROGRAM

A stakeholder engagement program has been developed for the Project that will support the EIS process in accordance with the *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022c). Key objectives of this program are to:

- engage with the NSW Government, regulators & corporations, Commonwealth Government, network operator, Aboriginal community, MidCoast Council and other key stakeholders about the Project;
- seek input from key stakeholders on the elements of the Project;
- recognise and respond to local interest or concerns regarding the Project; and
- continue the ongoing dialogue between Yancoal and its key stakeholders.

The issues raised and outcomes of the stakeholder engagement program would be reported in the EIS.

The consultation would include, but not necessarily be limited to, the following government agencies, authorities and transmission providers:

- NSW DPE;
- MidCoast Council;
- NSW Rural Fire Service;
- Environmental Protection Authority (EPA);
- Department of Planning and Environment – Water;
- NSW MEG;
- NSW Resources Regulator;
- Biodiversity, Conservation and Science Directorate;
- Department of Primary Industries – Agriculture;
- Transport for NSW;
- Heritage NSW;
- DCCEEW;
- EnergyCo;
- Essential Energy; and
- TransGrid.

The stakeholder engagement program also recognises other key stakeholders including:

- the Aboriginal community;
- local community groups/organisations;
- local land owners; and
- Stratford and Duralie Mine CCC.

The EIS engagement program would include the use of a variety of consultation mechanisms such as:

- public access to key documents (e.g. this request for the SEARs and the EIS);
- existing community information mechanisms, including:
  - community fact sheets;
  - provision of information on the SMC website;
  - regular updates to the Stratford and Duralie Mine CCC;
- face-to-face meetings with local land owners, local community groups and other community members;
- consultation with local indigenous groups and other registered Aboriginal parties in consideration of the requirements of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Department of Environment, Climate Change and Water [DECCW], 2010a); and
- meetings with government agencies and other key stakeholders.

5.3 SOCIAL IMPACT ASSESSMENT

The EIS will be supported by a Social Impact Assessment prepared in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (DPE, 2023).

6 PROPOSED ENVIRONMENTAL IMPACT ASSESSMENT

6.1 EXISTING ENVIRONMENT

6.1.1 STUDY AREA ENVIRONMENTAL CONSTRAINTS

The Project would be located on land associated with the existing SMC (including buffer lands). Accordingly, the Study Area, and its associated disturbance, has been designed to maximise development within the areas previously disturbed by the SMC (Figure 2).

Other key environmental constraints include:

- the extent of Yancoal-owned land (Figure 4);
- avoiding existing SMC biodiversity offset properties (Figure 8);
- targeting, where possible, areas previously disturbed by past agricultural activities (and avoiding, where possible, remnant woodland areas, which are indicated by the NSW Government's Plant Community Type (PCT) Mapping (Figure 8); and
- avoiding land zoned C3 (Environmental Management) that is located on Yancoal-owned land and runs parallel to The Bucketts Way (Figure 7).

6.1.2 STUDY AREA EXISTING ENVIRONMENT

The existing environment of the Study Area and its immediate surrounds has been reviewed based on data including from the SMC operations, aerial photography, land ownership mapping, NSW Government's mapping and preliminary environmental surveys for the Project.

Key environmental and heritage attributes of the Study Area and its immediate surrounds include:

- areas of remnant vegetation, and associated threatened species habitat, particularly at the upper reservoir and powerhouse locations (Figure 8);
- previously identified Aboriginal heritage sites (Figure 9);
- previously identified non-Aboriginal heritage sites located outside the Study Area (Figure 9);
- regional land and soil capability (LSC) mapping, indicating the Study Area contains LSC Class 4 (Moderate to severe limitations) to Class 8 (Extreme limitations) (Figure 10); and
- numerous unnamed 1st and 2nd order (Strahler Stream Order) drainage lines, including the 2nd order drainage line where the upper reservoir dam wall is proposed (Figure 11).

Native Vegetation and Threatened Species

The Study Area includes a wide range of vegetation and habitat types, including wet and dry-sclerophyll forest, open woodlands, rehabilitated mine landforms and exotic pasture.

Much of the Study Area is highly modified/disturbed due to existing mining and agriculture.

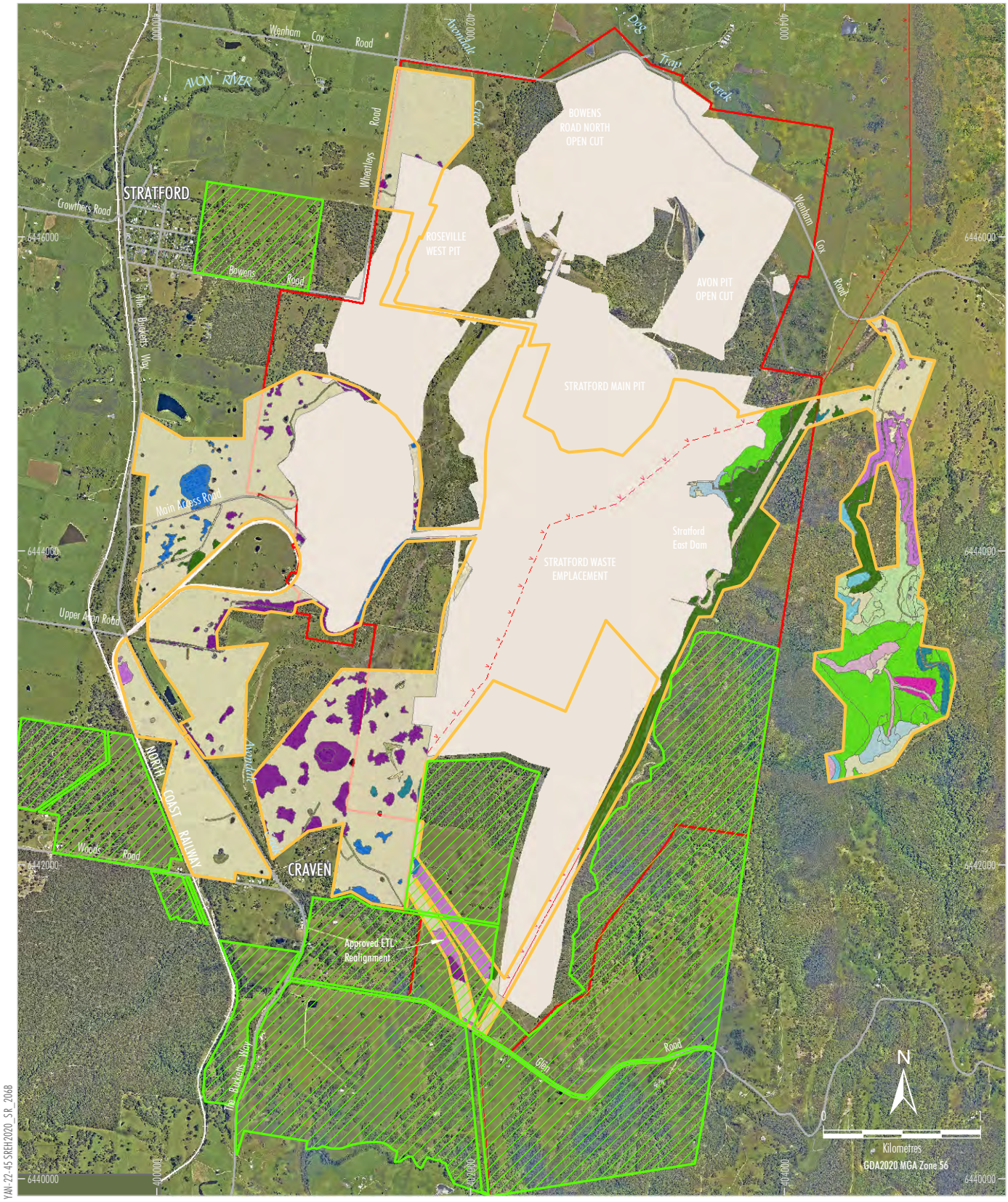
The Study Area has been subject to numerous terrestrial ecological studies to support assessment for the SMC. More recently, ecological field surveys have been undertaken by GHD Pty Ltd in 2022 and 2023, and are currently ongoing for the EIS.

Approximately 110 ha of the Project general arrangement located outside the SMC approved disturbance area comprises native vegetation. The most contiguous intact native vegetation is located in the higher elevation parts of the eastern section of the Study Area around the proposed upper reservoir (Figure 8).

Approximately 6 ha of PCT 3086 (*Lower North Hinterland Riparian Dry Rainforest*) within the Study Area is considered to be commensurate with the threatened ecological community *Lowland Rainforest of Subtropical Australia*.

In addition, approximately 55 ha of PCT 3329 (*Northern Hinterland Valleys Red Gum Grassy Forest*) and PCT 4042 (*Lower North Riverflat Eucalypt-Paperbark Forest*) are considered to be commensurate with the threatened ecological community *Subtropical Eucalypt Floodplain Forest and Woodland of the New South Wales North Coast and South-East Queensland Bioregions*). However, areas of this community comprise small patches scattered across the lower elevation areas of the Study Area, typically with highly disturbed understorey from cattle grazing.

Based on previous survey records and preliminary surveys for the Project, threatened and non-threatened remnant native vegetation within the Study Area provides habitat for a number threatened flora and fauna species.



YAN-22-45 SREH2020_SR_206B

LEGEND

- Mining Tenure
- 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area
- Offset Area

PCT Mapping

- 3086
- 3170
- 3241
- 3244
- 3251
- 3252
- 3254
- 3329
- 3433
- 3446
- 4042
- 4073
- Exotic

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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Preliminary Plant Community Type Mapping

Figure 8

YAN-22-45 SREH2020_SR_210A

LEGEND

- Mining Tenure
- 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area
- Non Aboriginal Heritage Site
- Non-Aboriginal Heritage - Local Significance Heritage Item
- Aboriginal Cultural Heritage Site
- Potential Aboriginal Cultural Heritage Site
- Salvaged Aboriginal Heritage Site

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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Previously Identified Heritage Sites

Figure 9

YAN-22-45 SREH2020_SR_207A

LEGEND

- Mining Tenure
- 132 kV Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area

LSC Mapping

- 4 - Moderate to severe limitations
- 5 - Severe limitations
- 6 - Very severe limitations
- 7 - Extremely severe limitations
- 8 - Extreme limitations
- Not assessed (98)

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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Land and Soil Capability Mapping

Figure 10

YAN-22-45 SREH2020_SR_208A

LEGEND

- Mining Tenure
- Approved Electricity Transmission Line
- Approved Electricity Transmission Line Re-alignment
- Approximate Extent of Existing/Approved Surface Development
- Preliminary EIS Study Area

Strahler Stream Order

- 1st Order
- 2nd Order
- 3rd Order
- 4th Order
- 5th Order

Source: Orthophoto - Yancoal (2021); NSW Spatial Service (2023)

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Local Water Resources

Figure 11

To date, threatened flora surveys for the Project have identified the presence of the following threatened flora species:

- Scrub Turpentine (*Rhodamnia rubescens*).
- Craven Grey Box (*Eucalyptus largeana*).

Threated fauna species that have been identified via surveys to date include:

- South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*).
- Long-nosed Potoroo (northern) (*Potorous tridactylus tridactylus*).
- Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*).
- Grey-headed Flying-fox (*Pteropus poliocephalus*).

Threatened flora and fauna surveys will continue during the preparation of the EIS, consistent with survey guidelines.

Aboriginal Sites and Artefacts

A number of Aboriginal cultural heritage surveys and assessments have been undertaken at the Study Area for the SMC.

71 Aboriginal cultural heritage sites registered on the Aboriginal Heritage Information Management System (AHIMS) have been identified within the SMC and surrounding areas. Of these, 18 sites are located within the Study Area and immediate surrounds (Figure 9). The most common site type is Artefacts (comprising of both artefact scatters and isolated finds), with the next common being Modified Trees.

Eight sites that lie within the approved SMC surface disturbance extent have already been subject to a surface collection and salvage program in accordance with the approved SMC Heritage Management Plan (Figure 9). Ten sites remain in-situ (Figure 9).

A number of historic heritage sites of local significance are located outside, but proximal to, the Study Area (Figure 9).

Land and Soil Capability

Regional Land and Soil Capability (LSC) mapping (Figure 10) indicates the Study Area comprises LSC Class 4 (moderate to severe limitations) to Class 8 (extreme limitation) land. Class 4 land is associated with the lower lying areas on the western side of the Study Area, while the area associated with the upper reservoir is mapped as Class 8.

There is no mapped Biophysical Strategic Agricultural Land within the Study Area.

Surface Water and Groundwater

The Avon River is most significant river in the Project region, and is located downstream of the Study Area (Figure 11). Further downstream it flows into the Gloucester River and then the Manning River.

Avondale Creek, Dogtrap Creek and a number of unnamed ephemeral drainage lines and creeks flow west and north-west across the Study Area towards the Avon River (Figure 11). As the un-named ephemeral drainage lines within the Study Area have small catchments, they typically exhibit low to zero flow for extended periods during dry weather, while heavy rainfall events result in short duration, high flow events.

The existing SMC water management system has modified flows of the unnamed drainage lines in the Study Area. The objectives of the SMC water management system include the diversion of ‘clean’ runoff (i.e. from undisturbed catchment areas) around the mining areas, and the capture of runoff from disturbed areas in on-site storages.

The upper reservoir would be located at the top of the catchment of an unnamed second-order drainage line (Figure 11). Runoff from this drainage line is currently diverted around the SED as part of the SMC water management system.

The main groundwater aquifers in the Gloucester Basin are associated with the coal seams. Local shallow groundwater occurrence (where present) typically mirrors the topography. The general direction of regional groundwater flow is from the south-east to the north-west, and the main groundwater discharge zones are Avondale and Dog Trap Creeks, and the Avon River.

Recharge to the groundwater systems occurs from rainfall and runoff infiltration, lateral groundwater flow and some leakage from watercourses. Although shallow groundwater levels are sustained by rainfall infiltration, they are also controlled by topography, geology and surface water levels in local drainages. Groundwater discharge occurs to local drainages and via evapotranspiration.

The existing mine voids hold significant volumes of water due to contributions from direct rainfall and groundwater inflows.

Receivers and Amenity

There are a number of private dwellings in the vicinity of the Project. However it is noted the mining and processing activities of the SMC have operated in accordance with noise and air quality related criteria at these receivers.

Similarly, the existing SMC landforms and infrastructure have changed the visual landscape in the immediate SMC area. However, views of the SMC from private dwellings or public vantage points are limited by intervening topography and vegetation. Views of the SMC landforms have also been mitigated by progressive rehabilitation.

The locations of dwellings surrounding the Project are shown on Figures 4 and 5. Yancoal owns all the freehold land within the Study Area, and a number of properties surrounding the Project due to the operation of the SMC.

The closest private dwellings have existing agreements in place (e.g. for purchase) with Yancoal for the SMC (Figure 4).

Stratford Village represents the largest density of private dwellings proximal to the Project, and is located approximately 1 km from the closest portions of the proposed Solar Farm.

In accordance with the NSW *Large-Scale Solar Energy Guideline: Technical Supplement – Landscape and Visual Impact Assessment* (DPE, 2022g), a Preliminary Visual Assessment was undertaken (Attachment D).

This Preliminary Visual Assessment is an initial screening exercise to identify sensitive receiver locations that may have direct views of the Project based on topography alone (i.e. not considering intervening vegetation or other structures that may obscure or soften the view). Further detailed assessment of these locations will be undertaken as part of the EIS, including consideration of intervening vegetation, etc.

The Preliminary Visual Assessment identified 207 sensitive receiver locations (comprising 128 privately owned dwellings, 52 resource company owned dwellings and 27 public receiver locations) within a 4 km study area of the proposed Solar Farm, and determined that 138 receiver locations (comprising 77 privately owned dwellings, 44 resource company owned dwellings and 17 public receiver locations) will require a detailed assessment as part of the EIS.

It is noted that the Preliminary Visual Assessment is a highly conservative preliminary assessment of likely potential visual impacts, given the existing extensive visual screening provided by the intervening vegetation.

6.2 OVERVIEW OF ENVIRONMENTAL IMPACTS

DPE has published Categories of Assessment Matters that includes a checklist of matters to assist proponents when developing and assessing projects.

The Categories of Assessment Matters have been reviewed to identify the key potential environmental issues associated with the construction and operation of the Project. Key potential environmental issues are those environmental aspects that will require Project-specific assessment to assess the potential impacts and develop measures to avoid, mitigate and/or monitor the potential impacts of the Project.

The proposed level and scope of assessments have been identified to assist DPE with the issuing of the SEARs for the Project.

The proposed level and scope of assessments were determined based upon:

- understanding of the strategic and statutory context (Sections 2 and 4);
- the details of the Project (Section 3);
- feedback from stakeholder consultation undertaken as part of the Project to date (Section 5);
- monitoring data from the existing SMC monitoring network;
- experience from previous environmental management and approval processes at the SMC;
- NSW *Large-Scale Solar Energy Guideline* (DPE, 2022f); and

- contemporary pumped hydro SEARs and assessments in NSW.

6.3 KEY MATTERS REQUIRING FURTHER ASSESSMENT IN THE ENVIRONMENTAL IMPACT STATEMENT

The key matters identified as requiring further assessment in the EIS for the Project are provided in Table 2, including a preliminary list of study requirements to address these matters. Suitably qualified and experienced specialists will be commissioned to conduct the studies outlined in Table 2.

Assessment of the key potential environmental issues and the other potential impacts identified above will include consideration of:

- the existing environment, using baseline data gathered over the life of the Project;
- potential impacts of all stages of the Project including relevant cumulative impacts;
- measures that could be implemented to avoid, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the Project; and
- contingency plans and/or adaptive management for managing any potentially significant residual risks to the environment.

Assessments for the EIS will consider applicable policies, guidelines and plans listed on DPE's website (https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines).

In addition to consideration of the key matters, potential impacts on other relevant environmental aspects will also be addressed as a component of the main text of the EIS.

The scope of the EIS will ultimately be defined by SEARs and any Commonwealth assessment requirements.

Table 2
Key Matters Requiring Further Assessment in the EIS

Environmental/Social Matter		Proposed Level and Scope of Assessment	Preliminary Strategies to Address Potential Impacts (to be refined during detailed impact assessment)
Access	Traffic and parking Road and rail facilities	**Detailed** Road Transport Assessment, including: • Assessment of changes in traffic volumes on the surrounding road network – in accordance with the *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002). • Assessment of any requirements for road and intersection upgrades. • Investigation of measures to avoid, mitigate and/or monitor the potential incremental impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential impacts on the road network.	• Use of the existing SMC access road for construction and operational traffic entering the site via The Bucketts Way, to minimise impacts to other traffic users. • Maximising the use of existing SMC infrastructure for carparks, laydown areas, internal access roads, the lower reservoir (via augmentation of the SED) and the Solar Farm development, to minimise additional disturbance associated with the Project. • Upgrade of existing access tracks to facilitate construction of the upper reservoir.
Air	Particulate Matter Gases	**Standard** Air Quality and Greenhouse Gas Assessment, including: • Modelling and assessment of potential air quality impacts as a result of Project activities – in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022). • Estimation of greenhouse gas emissions and consideration of relevant Government policy. • Investigation of measures to avoid, mitigate and/or monitor the potential impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential particulate matter and dust deposition impacts.	• Implementation of feasible and reasonable mitigation measures on-site to minimise particulate matter generation during construction. • Air quality monitoring network to maintain compliance with air quality criteria during construction.
Amenity	Noise Vibration	**Standard** Noise and Blasting Assessment, including: • Modelling and assessment of potential noise impacts as a result of construction activities and mining operations, including road and rail traffic – in accordance with relevant guidelines, including the *Noise Policy for Industry* (EPA, 2017), *NSW Road Noise Policy* (DECCW, 2011), and *Draft Construction Noise Guideline* (EPA, 2020). • Assessment of potential vibration and overpressure impacts as a result of blasting conducted during construction. • Investigation of measures to avoid, mitigate and/or monitor the potential impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential impacts on acoustic amenity.	• Implementation of feasible and reasonable mitigation measures on-site to minimise noise generation during construction and operations. • Noise monitoring network to maintain compliance with noise criteria during construction. • Implementation of blast monitoring procedures to maintain compliance with blast criteria during construction.

Table 2 (Continued)
Key Matters Requiring Further Assessment in the EIS

Environmental/Social Matter		Proposed Level and Scope of Assessment	Preliminary Strategies to Address Potential Impacts (to be refined during detailed impact assessment)
Amenity	Visual	**Detailed** Landscape and Visual Assessment prepared in accordance with the *Large-Scale Solar Energy Guideline* (DPE, 2022f), including: • Simulation of landscape and visual impacts as a result of the Project, particularly from private residences and publicly accessible viewpoints. • Investigation of measures to minimise and manage the impacts of the Project. **Standard** Glint and Glare Assessment prepared in accordance with the *Large-Scale Solar Energy Guideline* (DPE, 2022f), including: • Use of the industry standard glare analysis tool to determine areas where glare will occur. • Assessment of potential impacts as a result of glint and glare associated with the Project. • Investigation of measures to minimise and manage the impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential visual impacts.	• Use of a tunnelled waterway between the upper and lower reservoirs, rather than above-ground pipes, to minimise visual impacts. • Vegetative screening as required to minimise visual impacts along The Bucketts Way and for any significantly affected private residences. • Rock faced dam (rather than concrete faced dam).
Biodiversity	Aquatic flora and fauna	**Detailed** Aquatic Ecology Assessment, including: • Assessment of potential impacts on aquatic species, populations, ecological communities or their habitats, including consideration of groundwater and surface water assessments. • Identification of measures that would be implemented to maintain or improve the aquatic ecology values of the surrounding region in the medium to long-term.	• Implementation of stream health monitoring and water quality management measures. • Implementation of a water management strategy.
	Terrestrial flora and fauna	**Detailed** Biodiversity Development Assessment Report prepared in accordance with the *Biodiversity Assessment Method 2020* (DPIE, 2020c), including: • Assessment of potential impacts on any terrestrial species, populations, ecological communities or their habitats, including consideration of surface disturbance activities and extents and groundwater and surface water assessments. • Identification of measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long-term.	• Avoidance of disturbance where feasible and reasonable. • Use of previously disturbed/cleared areas to maximum extent possible. • Implementation of surface disturbance protocols, including pre-clearance surveys, and weed and feral animal control measures. • Implementation of offset and compensatory measures in accordance with relevant NSW and Commonwealth Government policies.

Table 2 (Continued)
Key Matters Requiring Further Assessment in the EIS

Environmental/Social Matter		Proposed Level and Scope of Assessment	Preliminary Strategies to Address Potential Impacts (to be refined during detailed impact assessment)
Built Environment	Public Infrastructure	**Detailed** Road Transport Assessment, including: • Assessment of changes in traffic volumes on the surrounding road network – in accordance with the *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002). • Investigation of measures to avoid, mitigate and/or monitor the potential incremental impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential impacts on the road network. **Standard** Noise and Blasting Assessment to include assessment of potential vibration and overpressure impacts as a result of blasting conducted for the Project.	• Use of the existing SMC access road for construction and operational traffic entering the site via The Bucketts Way, to minimise impacts to other traffic users. • Maximising the use of existing SMC infrastructure for carparks, laydown areas, internal access roads, the lower reservoir (via augmentation of the SED) and the Solar Farm development, to minimise additional disturbance associated with the Project. • Upgrade of existing access tracks to facilitate construction of the upper reservoir. • Implementation of blast monitoring procedures to maintain compliance with blast criteria during construction.
Economic	Natural resource use Livelihood Opportunity cost	**Standard** Economic Assessment, including: • Description of the existing local and state economies and how the Project would contribute to these economies. • Assessment of the economic impacts and benefits to the State of NSW and local communities. **Focused engagement** with other industries and businesses in the area.	• Implementation of strategies to maximise local employment and support local businesses.
Hazards and risks	Bushfire	**Standard** assessment of potential bushfire risk. **Focused engagement** with local NSW Rural Fire Service.	• Development of bushfire management and mitigation measures to minimise bushfire risk to and from Project infrastructure.
	Dams safety	**Standard** assessment of dams safety.	• Compliance with dam safety legislation.
	Flooding	**Standard** flood impact assessment to be completed as part of the Surface Water Assessment. **Focused engagement** with Dams Safety NSW.	• Compliance with dam safety legislation.
	Groundwater contamination	**Standard** assessment of potential for groundwater seepage to be completed as part of the Groundwater Assessment.	• Suitable containment of water in the PHES.
	Land contamination	**Standard** Land Contamination Assessment, including: • Assessment of potential for contaminated land within the Study Area and identification of contaminated sites. • Investigation of required remediation works to be undertaken prior to the commencement of the Project.	• Any contaminated soil as a result of the development to be remediated in accordance with relevant guidelines. • Rainfall run-off from Project disturbance areas would be managed to prevent contamination of downstream water sources from sediment laden water.

Table 2 (Continued)
Key Matters Requiring Further Assessment in the EIS

Environmental/Social Matter		Proposed Level and Scope of Assessment	Preliminary Strategies to Address Potential Impacts (to be refined during detailed impact assessment)
Heritage	Aboriginal	**Detailed** Aboriginal Cultural Heritage Assessment prepared in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b), and *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011), including: • Assessment of impacts on items of Aboriginal cultural heritage and Aboriginal cultural values. • Investigation of measures to avoid, mitigate, monitor and manage the potential impacts of the Project. **Focused engagement** with interested Aboriginal parties.	• Consideration of environmental assessment outcomes during detailed Project design work (e.g. locations of Aboriginal heritage sites). • Involvement of the Aboriginal stakeholders during the assessment and operational phases. • Implementation of Ground Disturbance Permit process. • Implementation of management measures to mitigate and monitor potential impacts on Aboriginal heritage. • Management of any identified cultural heritage sites in accordance with a Cultural Heritage Management Plan.
	Historic	**Standard** Historic Heritage Assessment, including: • Assessment of potential impacts on non-Aboriginal cultural heritage. • Investigation of measures to avoid, mitigate, monitor and manage the potential impacts of the Project. **Focused engagement** with interested stakeholders.	• Consideration of environmental assessment outcomes during detailed Project design work (e.g. locations of historic heritage sites). • Management of any identified historic heritage sites in accordance with a Heritage Management Plan.
Land	Land capability Soil chemistry	**Standard** Soil and Agricultural Assessment prepared in accordance with the *Large-Scale Solar Energy Guideline* (DPE, 2022f), including: • Delineation of soil landscape units present in the Study Area. • Identification of Land and Soil Capability classes in the Study Area. • Assessment of potential impacts to agricultural enterprises and industry as a result of the Project, including consideration of water availability, change in land use and socio-economic effects. • Investigation of measures to avoid, mitigate, monitor and manage the potential impacts of the Project.	• Maximising use of previously disturbed and cleared areas

Table 2 (Continued)
Key Matters Requiring Further Assessment in the EIS

Environmental/Social Matter		Proposed Level and Scope of Assessment	Preliminary Strategies to Address Potential Impacts (to be refined during detailed impact assessment)
Social	Way of Life Community Accessibility Culture Surroundings Livelihoods	**Detailed** Social Impact Assessment prepared in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (DPE, 2023), including: • Investigation of measures to avoid, mitigate and/or monitor the potential impacts of the Project. **Focused engagement** with relevant stakeholders.	• Implementation of strategies to increase local employment and support of local businesses and community groups. • Yancoal would undertake negotiations with the MidCoast Council regarding a Planning Agreement for the Project, where required.
	Health and Wellbeing	**Standard** Air Quality and Greenhouse Gas Assessment. **Standard** Noise and Blasting Assessment. **Detailed** Social Impact Assessment. **Focused engagement** with the local community and landholders concerned about potential impacts to health and wellbeing.	• Implementation of feasible and reasonable mitigation measures on-site to minimise dust emissions and noise and blasting generation during construction. • Noise and air quality monitoring during construction to maintain compliance with criteria.
Water	Hydrology Water availability Water quality	**Detailed** Groundwater Assessment, including: • Assessment of the impacts of the Project on the quantity and quality of the region's groundwater resources, connectivity between groundwater sources, groundwater-dependent assets and groundwater-related infrastructure. • Numerical groundwater modelling in accordance with the *Australian groundwater modelling guidelines* (Barnett et al., 2012). • Investigation of measures to avoid, mitigate, remediate, monitor the potential impacts of the Project. • Expert peer review of the groundwater assessment. **Detailed** Surface Water Assessment, including: • Assessment of the impacts of the Project on the quantity and quality of the region's surface water resources, connectivity between surface water sources, surface water-dependent assets and surface water-related infrastructure. • Detailed site water balance for the Project, incorporating development of a water management strategy for the life of the Project. • Investigation of measures to avoid, mitigate, remediate, monitor the potential impacts of the Project. **Focused engagement** with the local community and landholders concerned about potential impacts on water availability and water quality.	• Beneficial re-use of water contained in mine voids to initially fill and to top-up the PHES when required, avoiding reliance on external water sources. • Suitable containment of void water in the PHES, to prevent uncontrolled release of surface water and minimise seepage to groundwater. • Management of water within the PHES, to prevent uncontrolled discharge to surface drainages and to minimise seepage to groundwater.

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ATTACHMENT A

CUMULATIVE IMPACT ASSESSMENT SCOPING TABLE

Table A-1
Cumulative Impact Assessment Scoping Table

Future Projects	Approximate Distance from Project	Indicative Timing/Overlap	Potential Overlap Between Impacts of the Project on Environmental Matters and Impacts of Other Project on the Same Environmental Matter							
			Amenity (Air, Noise and Human Health)	Groundwater	Surface Water	Social	Road Transport	Rail Access and Rail Noise	Visual, Landscape and Final Landform	Biodiversity and Heritage
Stratford Coal Mine	Adjacent to the Project site	Mine closure activities	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Duralie Coal Mine	21 km south	Mine closure activities	Not anticipated to interact with the Project.							
Hillview Hard Rock Quarry	40 km south	Prepare EIS	Not anticipated to interact with the Project							
Bobs Farm Sand Mine	37 km south	Assessment	Not anticipated to interact with the Project							
Brandy Hill BESS	61 km south-west	Prepare EIS	Not anticipated to interact with the Project							

ATTACHMENT B

PRE-CONDITIONS TO GRANTING CONSENT AND MANDATORY MATTERS FOR CONSIDERATION

Table B-1
Pre-conditions to Granting Consent

Statutory Reference	Pre-condition	Relevance
NSW *Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)*		
clause 23(1)	A development application may be made by— (a) the owner of the land to which the development application relates, or (b) another person, with the written consent of the owner of the land.	Yancoal is the owner of private land required for the Project. Landowner consent for access to public land (e.g. Crown and/or Council land) will be obtained for the development application, where required. Clause 18 of the EP&A Regulation also require landowner's consent for SSI. CSSI does not require landowner's consent (clause 181[5]) subject to satisfying the notification requirements of clause 181(6) of the EP&A Act.
clause 56(2)	As soon as practicable after a development application is lodged, the consent authority must— (a) publish notice of application on the consent authority's website, and (b) give notice of application to— (i) the public authorities that, in the consent authority's opinion, may have an interest in the determination of the application, and (ii) the persons that own or occupy the land adjoining the land to which the application relates.	Clause 56(2) applies to SSD in accordance with clause 56(1).
NSW *State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)*		
clause 4.6(1)	A consent authority must not consent to the carrying out of any development on land unless— (a) it has considered whether the land is contaminated, and (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.	The Resilience and Hazards SEPP would be considered for the Project and a Land Contamination Assessment would be included in the EIS.
NSW *Biodiversity Conservation Act 2016 (BC Act)*		
clause 7.9(3)	The environmental impact statement that accompanies any such application is to include the biodiversity assessment required by the environmental assessment requirements of the Planning Agency Head under the *Environmental Planning and Assessment Act 1979*.	A Biodiversity Development Assessment Report will be prepared for the Project as part of the EIS.

Table B-1 (Continued)
Pre-conditions to Granting Consent

Statutory Reference	Pre-condition	Relevance
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*		
section 131AA(1)	Before the Minister decides whether or not to approve, for the purposes of a controlling provision, the taking of an action, and what conditions (if any) to attach to an approval, he or she must: (a) inform the person proposing to take the action, and the designated proponent of the action (if the designated proponent is not the person proposing to take the action), of: (i) the decision the Minister proposes to make; and (ii) if the Minister proposes to approve the taking of the action—any conditions the Minister proposes to attach to the approval; and (b) invite each person informed under paragraph (a) to give the Minister, within 10 business days (measured in Canberra), comments in writing on the proposed decision and any conditions.	The Project will be referred to the Commonwealth Minister for the Environment for consideration as to whether the Project meets the criteria of a 'Controlled Action' and requires approval under the EPBC Act.

Table B-2
Mandatory Matters for Consideration

Statutory Reference	Mandatory Consideration
Considerations under the EP&A Act	
section 1.3	Relevant objects of the EP&A Act: • Promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources. • Facilitate ecologically sustainable development (ESD) by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. • Promote the orderly and economic use and development of land. • Protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats. • Promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage). • Promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State. • Provide increased opportunity for community participation in environmental planning and assessment.
Part 3 (for SSD)	Relevant environmental planning instruments: • Resilience and Hazards SEPP. • Gloucester LEP. • Any planning agreement or draft planning agreement that a developer has entered into under section 7.4 of the EP&A Act. • The EP&A Regulation (to the extent that it prescribes matters for the purposes of section 4.15(1)(a)(iv) of the EP&A Act). This includes consideration of the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; the suitability of the site for the development; any submissions made in accordance with the EP&A Act or the EP&A Regulation; the public interest. Environmental planning instruments are not mandatory considerations for SSI/CSSI.
section 4.15 (for SSD)	In determining a development application, a consent authority is to take into consideration of the matters as are of relevance to the development the subject of the development application, including: • The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality, • The suitability of the site for the development, • Any submissions made in accordance with this Act or the regulations, • The public interest.

Table B-2 (Continued)
Mandatory Matters for Consideration

Statutory Reference	Mandatory Consideration
Considerations under the BC Act	
section 7.14(2)	The consent authority is to take into consideration the likely impact of the proposed development on biodiversity values as assessed in the Project BDAR.
section 7.16(3)	If the consent authority is of the opinion that the Project is likely to have serious and irreversible impacts on biodiversity values, the consent authority is required to: • take those impacts into consideration; and • determine whether there are any additional and appropriate measures that would minimise those impacts if consent or approval is to be granted.
Considerations under the Gloucester LEP	
clause 2.3(2)	The consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within the zone.

Table B-2 (Continued)
Mandatory Matters for Consideration

Statutory Reference	Mandatory Consideration
Considerations under the EPBC Act	
section 136(1)	In deciding whether or not to approve the taking of an action, and what conditions to attach to an approval, the Commonwealth Minister for the Environment must consider the following: • matters relevant to any matter that the Minister has decided is a controlling provision for the action; and • economic and social matters.
section 136(2)	In considering the matters referred to in section 136(1), the Commonwealth Minister for the Environment must take into account: • the principles of ESD; • the assessment report (if any) relating to the action; • … • if Division 6 (environmental impact statements) of Part 8 applies to the action: - the finalised EIS; - the recommendation report relating to the action; • if a relevant inquiry was conducted, the report of the commissioners; • any other information the Minister has on the relevant impacts of the action; • any relevant comments given to the Minister; • any relevant advice obtained by the Minister from the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development; and • notices or relevant comments provided in accordance with the EPBC Act.
section 139(1)	In deciding whether or not to approve the taking of an action with respect to threatened species and endangered communities, and what conditions to attach to such approval, the Commonwealth Minister for the Environment must not act inconsistently with: • Australia's obligations under: - the Biodiversity Convention; or - the Apia Convention; or - the Convention on International Trade in Endangered Species of Wild Fauna and Flora; or • a recovery plan or threat abatement plan.
section 139(2)	If the Commonwealth Minister for the Environment is considering whether to approve the taking of an action and the action has or will have, or is likely to have, a significant impact on a particular listed threatened species or a particular listed threatened ecological community the Minister must, in deciding whether to so approve the taking of the action, have regard to any approved conservation advice for the species or community.

ATTACHMENT C

STRATFORD RENEWABLE ENERGY HUB
FACT SHEETS

STRATFORD RENEWABLE ENERGY HUB

Fact Sheet
December 2022

Yancoal Australia Ltd is currently investigating diversification opportunities, including investment in other energy related projects, to create a sustainable long-term business. The Stratford Mining Complex has been identified as an ideal location to establish a renewable energy hub post-mining. This beneficial post-mining land use has the potential to provide continued investment to the Gloucester Valley.

EXISTING MINING OPERATIONS

The Stratford Mining Complex is an existing open cut coal mining complex located 95 kilometres north of Newcastle in the Gloucester Valley. It began operating in 1995 and is now scheduled to finish in 2024 and closure planning has commenced.

PROPOSED PROJECT

The proposed Stratford Renewable Energy Hub (SREH) includes a:

- **Pumped Hydro Energy Storage** (3600MW hrs over a 12 hour cycle)
- **Solar Farm Facility** (330MW initial capacity)

The SREH would be developed on and adjacent to the Stratford Mining Complex on Yancoal-owned land. The centrepiece of the SREH is the Pumped Hydro Energy Storage which would utilise the mine's existing dams and water stocks as a lower reservoir and backup water supply and storage.

The Pumped Hydro Energy Storage would provide on-demand, dispatchable power into the grid at peak times or when the energy generated by other renewable energy sources is unavailable.

The "behind the meter" Solar Farm Facility would provide a portion of the energy to recharge the Pumped Hydro during daylight hours when there is excess renewable electricity already in the grid.

CURRENT STATUS

Yancoal has completed a Pre-Feasibility Study and commenced the following:

- a Feasibility Study;
- baseline environmental studies; and
- stakeholder engagement.

STRATEGIC CONTEXT

Pumped Hydro Energy Storage has been endorsed by Government as one of the most effective and reliable forms of long duration energy storage which will be required to balance the growing supply of intermittent renewable energy sources following the staged closure of coal-fired power stations across the country.

The SREH would help NSW meet its targets to replace 5GW of coal-fired electricity by 2030 and build 2GW of new long duration storage by 2030.

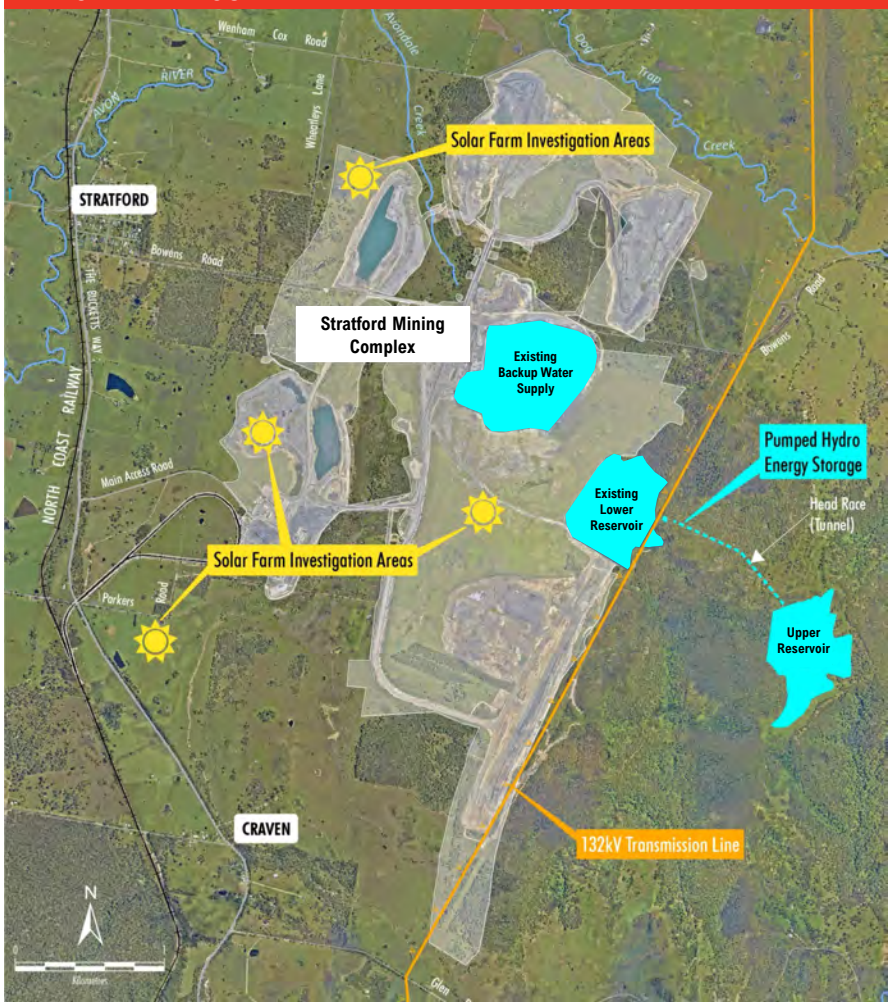
AN IDEAL LOCATION

The Stratford Mining Complex's proximity to existing electricity transmission infrastructure and demand centres, its expansive landholding and the topography make it an ideal location for a renewable energy hub.

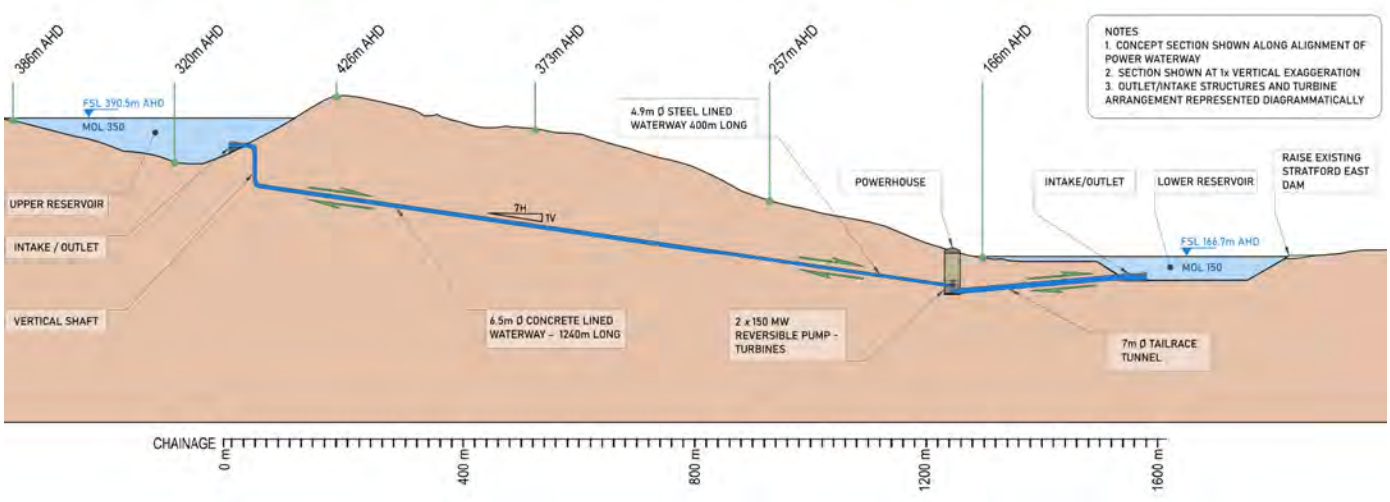
PROJECT BENEFITS

- Aligns with Government objectives to decarbonise the electricity network and promote private investment in large-scale renewable energy projects to deliver reliable and affordable electricity to households and businesses
- Provides long duration energy storage to deliver dispatchable power at times of high demand and low supply
- Provides enough renewable energy equivalent to the daily energy consumption of 140,000 to 180,000 households
- Provides an opportunity to beneficially re-use part of the land after the cessation of coal mining in 2024
- Generates investment in the Gloucester Valley
- Further potential to expand the SREH to include other renewable energy sources

INDICATIVE LAYOUT



PUMPED HYDRO ENERGY STORAGE CONCEPT



If you would like further information on the proposed Project, please do not hesitate to contact us.

Email: SREH.feedback@yancoal.com.au
Website: www.stratfordcoal.com.au/page/SREH

YANCOAL 兖煤澳大利亚有限公司

OUR PATH TO TRANSITION
Focused on Australian futures

STRATFORD RENEWABLE ENERGY HUB

Fact Sheet
April 2023

Yancoal Australia is currently investigating diversification opportunities to create a sustainable long-term business. The Stratford Mining Complex is an ideal location to establish a renewable energy hub after mining has ended, which could generate investment and other benefits to the Gloucester Valley.

WHERE IS THE PROJECT LOCATED?

The proposed **Stratford Renewable Energy Hub** (SREH) is located in the Gloucester Valley, 95 kilometres north of Newcastle.

The SREH would be developed on and adjacent to the Stratford Mining Complex, where coal mining will end in 2024.

WHAT DOES THE PROJECT INCLUDE?

The SREH will initially include:

Pumped Hydro Energy Storage
3600MW hrs over a 12 hour cycle

Solar Farm Facility
330MW

The SREH will require a connection to the transmission network. Yancoal is currently working with transmission network service providers to identify connection options and network upgrades.

WHAT IS YANCOAL'S PLAN FOR ENGAGEMENT?

Yancoal has been engaging with a range of stakeholders on SREH and welcomes the feedback received to date.

Yancoal will continue to consult with the community, Council, Government agencies and other key stakeholders as the Project progresses.

WHY IS PUMPED HYDRO CRITICAL TO THE TRANSITION TO RENEWABLE ENERGY?

The Australian Energy Market Operator (AEMO) has identified that the closure of coal-fired power stations across the country is likely to lead to considerable electricity shortfalls after 2028.

To address this electricity shortfall and supplement the growing but intermittent renewable energy supply, long duration energy storage is needed.

Pumped Hydro Energy Storage has been endorsed by Federal and State Governments as one of the most effective and reliable forms of long duration energy storage, because it delivers dispatchable power at times of high demand and low supply.

The NSW Government has also set a target of building an additional 2 Giga Watts (GW) of long duration energy storage by 2030. SREH would represent 15% of this target.

If developed within the anticipated timeframe, SREH could play a key role in supplying electricity to offset future energy shortages identified by AEMO and the NSW Government.

WHEN WILL YANCOAL COMMENCE THE APPROVAL PROCESS?

The first part of the approval process is for Yancoal to submit a Scoping Report with the NSW Department of Planning and to request the requirements for the project's Environmental Impact Statement (EIS).

Yancoal is aiming to make this request in July 2023. Studies to support an EIS have already commenced.

WHEN WOULD SREH GENERATE ITS FIRST ELECTRICITY?

Project approvals are likely to take two years, before construction, which is expected to take three years, can commence.

First power from the SREH could be generated during 2028 (refer to timeline below).

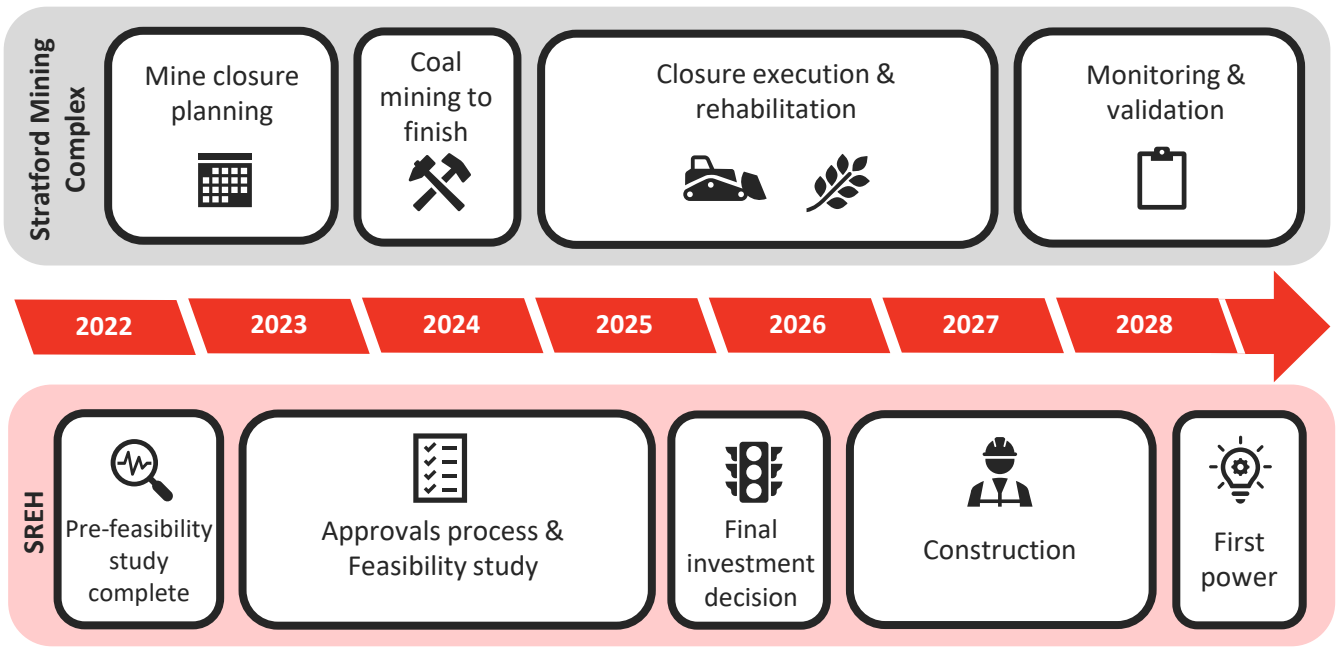
The SREH aligns with Government objectives to decarbonise the state's electricity network and to promote private investment in large-scale renewable energy projects.

HOW DOES THE SREH ALIGN WITH END OF MINING AT STRATFORD?

With coal mining set to finish in 2024, the closure of the Stratford mine will coincide with potential construction of the SREH (refer to timeline below). This provides an opportunity to repurpose existing mining infrastructure, water stocks and land for the SREH.

Yancoal is confident the two processes can be effectively and safely harmonised.

TIMELINE



If you would like further information on the proposed Project, please do not hesitate to contact us.

Email: SREH.feedback@yancoal.com.au
Website: www.stratfordcoal.com.au/page/SREH

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ATTACHMENT D

STRATFORD RENEWABLE ENERGY HUB
PRELIMINARY VISUAL ASSESSMENT FOR SOLAR FARM

180 Lonsdale Street, Level 9
Melbourne, Victoria 3000
Australia
ghd.com

Your ref:
Our ref: 12604910

15 November 2023

Michael Moore
Manager Approvals
Yancoal Australia Limited

Stratford Renewable Energy Hub – Preliminary Visual Assessment for Solar Farm

Dear Michael

1. Introduction

1.1 Project overview

The Stratford Renewable Energy Hub (the Project) is located in the Gloucester Valley, approximately 95 kilometres (km) north of Newcastle. The Project is proposed to be developed on and adjacent to the Stratford Mining Complex, where coal mining is proposed to end in 2024. The Project would include pumped hydro energy storage, a 330 MW solar farm facility and a connection to the existing transmission network. The Project aligns with Government objectives to decarbonise the state's electricity network and to promote private investment in large-scale renewable energy projects.

1.2 Purpose

The purpose of this letter is to prepare a Preliminary Visual Assessment for the solar farm component of the Project, to be included in the Scoping Report for the Project. The Preliminary Visual Assessment is required to be undertaken in accordance with the assessment approach outlined in the *Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline* (NSW Department of Planning and Environment, 2022) (hereafter referred to as the 'Technical Supplement').

1.3 Assumptions

It is inherent in the assessment process that project elements may change following submission of the Scoping Report. Any project changes would be reviewed during preparation of the environmental impact statement (EIS) for the Project and considered in the final Landscape and Visual Impact Assessment (LVIA).

It is also noted that the Project contains elements – particularly the pumped hydro energy storage that are not covered by the Technical Supplement, but would be considered in the LVIA.

2. Methodology

2.1 Standards and guidance

The preliminary visual assessment has been prepared in accordance with the following guideline:

– *Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline* (NSW Department of Planning and Environment, 2022) (Technical Supplement)

2.2 Preliminary visual assessment

2.2.1 Solar farm

2.2.1.1 Preliminary overview of existing environment

A preliminary desktop review of the baseline landscape and visual environment has been undertaken for a 4-km study area from the proposed solar farm envelope, using existing information, including topography, land use, legislation and policy, Google street view, and privately owned residential locations provided by Yancoal Australia Ltd (Yancoal), the applicant for the Project. This desktop review informed the selection of public receiver locations, including public roads and rail lines within 2.5 km, and other public locations within 4 km of the solar farm.

2.2.1.2 Preliminary visual assessment tool analysis

The preliminary visual assessment stage is used to identify viewpoints that require a detailed assessment in stage 2. Preliminary Assessment Tools provided in the Technical Supplement have been used to undertake this assessment. The tools are designed to identify where community and landholder consultation should be focused, and to eliminate the need to assess viewpoints that are likely to experience very low impacts. The tools rely on quantitative data collected during the desktop assessment, including:

– *The vertical and horizontal field of view that a development is likely to occupy when viewed from each viewpoint, and is influenced by distance, height elevation changes, and width of a project*

The methodology for the preliminary visual assessment, as outlined in the Technical Supplement, is as follows:

– *Identify all viewpoints from public roads and rail lines within 2.5 km of the proposed development*
– *Identify other public and private viewpoints within 4 km of the proposed development*
– *Calculate the distance of each of these viewpoints from the nearest point of the proposed development*
– *Determine the 'relative height difference' between the proposed development and each viewpoint*
– *Plot each viewpoint on the Preliminary Assessment Tool – Vertical Field of View (Figure 2)* (within the Technical Supplement) *to determine the indicative vertical field of view (as either 1,2,3 or 4+ degrees)*
– *Measure the worst-case horizontal field of view of the project from each viewpoint (not considering topography or vegetation)*
– *Compare the vertical and horizontal fields of view using the matrix in Table 1* (within the Technical Supplement) *to determine whether detailed visual assessment of each viewpoint is required*

The Preliminary Assessment Tools focus on viewpoints with views to the solar array. Additional viewpoints have been considered for any other infrastructure that have potential to cause impacts beyond the solar arrays.

Refer to the Technical Supplement for a detailed description of the Preliminary Assessment Tools.

2.2.1.2.1 Parameters used

Refer to Table 2.1 for the parameters used for each preliminary assessment tool criteria.

Table 2.1 Preliminary assessment tool parameters

Criteria	Source / parameters used
Study area	4 km buffer distance offset from the outer extent of the proposed solar farm.
Private receivers	Provided by Yancoal (the Project applicant).
Public receivers	Locations identified by GHD (prior to undertaking zone of theoretical visibility analysis).
Distance from receiver to nearest point of proposed development (distance to development)	Distance calculated from receiver location to Preliminary EIS study area boundary, which was adjusted on the eastern side around the solar farm to exclude the pumped hydro and other works.
Elevation at receiver	Digital terrain model created using 1 m and 2 m resolution digital elevation models (DEMs). DEMs were sourced from Elevation Information System (ELVIS) and best resolution was used where available. The final mosaiced DEM was resampled to 5 m resolution for performance.
Highest point of design	Highest theoretical point of design was 187.8 m AHD. This height was determined using the design terrain (closure stage) combined with the existing terrain, with the addition of proposed infrastructure heights.
Lowest point of design	Lowest theoretical point of design was 110.0 m AHD. This height was generated using the design terrain combined with the existing terrain.
Relative height difference	Height of receiver is compared to the low and high points of the solar farm and the respective formula is used from the DPE guidelines.
Horizontal field of view	Angles calculated using Preliminary EIS study area boundary, which was adjusted on the eastern side around the solar farm to exclude pumped hydro and other works.
Sector	Distance and relative height formulas from the DPE provided Preliminary Visual Assessment Tool XLSX.

2.2.1.3 Zone of theoretical visibility

Zone of theoretical visibility (ZTV) analysis is a computer-generated analysis which identifies land from which it is theoretically possible to view the components of the Project. ESRI ArcGIS software was used to model the ZTV of the solar farm. A digital terrain model was produced using one and two metre resolution DEMs.

The ZTVs were analysed using the following parameters:

– A viewing height of 1.7 m, which is the average within the typical viewing level range of an adult;
– Indicative heights for operation phase infrastructure as outlined in Table 2.2; and
– The combination of the final and existing landform terrain was used to offset proposed infrastructure heights to generate the ZTV.

Table 2.2 Indicative infrastructure heights used to generate the solar farm ZTV

Proposed infrastructure	Height (from design surface level OR m AHD)
Solar arrays	2.8 m (representative point used across solar farm)
Power stations	3.4 m (representative point used across solar farm)
Substation	4 m

The GIS software digitally determines the likely extent over which a feature would be visible or not visible. In interpreting the ZTV, the following issues must be considered:

– It only takes into account the landform and does not include land cover factors such as the presence of buildings and trees, therefore it represents the worst-case scenario of potential visual impact;

– It does not take into account the effect of distance. The greater the distance from the Project, the lower the impact, as the development will take up a smaller portion of the view, and atmospheric conditions may reduce the visual prominence of the Project; and
– The ZTV is only accurate to the resolution of the elevation model.

2.2.2 Other infrastructure

A ZTV analysis has been undertaken and preliminary considerations given for other infrastructure associated with the Project aside from the solar farm, which includes the pumped hydro and connection to the existing transmission network.

2.2.2.1 Zone of theoretical visibility

A ZTV analysis was undertaken for key operation phase infrastructure associated with the pumped hydro and transmission connection, using the same approach outlined in section 2.2.1.3. Refer to Table 2.3 for indicative heights used.

Table 2.3 Indicative infrastructure heights used to generate the pumped hydro and transmission ZTV

Proposed infrastructure	Height (from design surface level OR m AHD)
Intake structure (upper reservoir)	400 m AHD
Upper reservoir dam wall (top of parapet wall)	392 m AHD
Office (upper reservoir)	4 m
Powerhouse	20 m (indicative building height on pad)
Substation	20 m (proposed gantry)
Proposed 132 kV transmission line realignment	10 m

3. Preliminary Visual Assessment

3.1 Solar farm

3.1.1 Preliminary overview of existing environment

The proposed solar farm is located on land within and surrounding the existing Stratford Mine Complex, which is proposed to be closed and rehabilitated in future as part of a separate project. The solar farm extends on the west to The Bucketts Way and the North Coast Railway, to the north to Wenham Cox Road, to the south near Woods Road, and to the east, to an existing reservoir within the mine site.

Land within the 4-km study area largely comprises of rural land uses surrounding the existing coal mine, with The Glen Nature Reserve on the forested elevations to the east. Two settlements are present; the village of Stratford located to the north-west of the solar farm, and the small settlement of Craven, to the southern edge of the solar farm. The Bucketts Way is located on the western edge of the solar farm and is a key north-south transport route and designated 'Tourist Drive' through the Gloucester Valley, connecting small towns and villages. The North Coast Railway runs in a similar alignment, forming passenger and freight rail connections between Sydney and Brisbane. Three passenger stations are located in the study area, however they are all closed. The Glen Nature Reserve includes a number of walking trails and an informal camping area, and is accessed via Glen Road, located south of the solar farm.

The study area is located within the Mid-Coast local government area. Land use is largely comprised of RU1 Primary Production land. Land uses associated with Stratford village include RU5 – Village, RE1 Public Recreation, SP1 Special Activities associated with a cemetery. Land use associated with The Glen Nature Reserve to the east of the study area comprises C1 National Parks and Nature Reserves. Land designated as C3 Environmental Management is associated with a forested area to the west of the settlement of Craven, and E5 Heavy Industrial is present within a section of the existing coal mine.

The study area is located within the Gloucester Basin, a large coal-bearing geological formation. The solar farm is proposed within the valley floor where topography is naturally flatter. The lower elevations are around 110 m AHD associated with the Avon River. The topography rises quickly to the east of the study area, with high points rising above 460 m AHD within The Glen Nature Reserve. Topography within the existing coal mine area has been modified over time through mining activities. Major waterways within the study area include the Avon River to the north and Wards River to the south. Dog Trap Creek and Coal Creek are also present, to the north and south of the study area respectively. Small farm dams are scattered across the rural lands on the valley floor, with large dams present within the existing coal mine.

Vegetation within the study area includes a combination of cleared areas with scattered trees associated with agricultural land uses, pockets of dense forest within the valley and on the foothills, and dense forest on the eastern elevations and within The Glen Nature Reserve. Large patches of forested vegetation appear to be present within the valley surrounding parts of the proposed solar farm, and to the south eastern side of Stratford village. Buffers of vegetation are present along sections of The Bucketts Way, the North Coast Railway, Glen Road, and along waterways. Clusters of vegetation and tree rows appear to also be present, which are typically associated with rural residences. NSW Mitchell Landscapes (Department of Planning and Environment, 2016) within the study area include 'Maf - Manning - Macleay Channels and Floodplains', and 'Sms - Stroud Mountains'.

3.1.2 Receiver locations

Private receiver data was provided by Yancoal, and constrained to four kilometres from the proposed solar farm. In addition, public receiver locations were identified by GHD based on the desktop review undertaken.

Private receiver data includes the following broad categories:

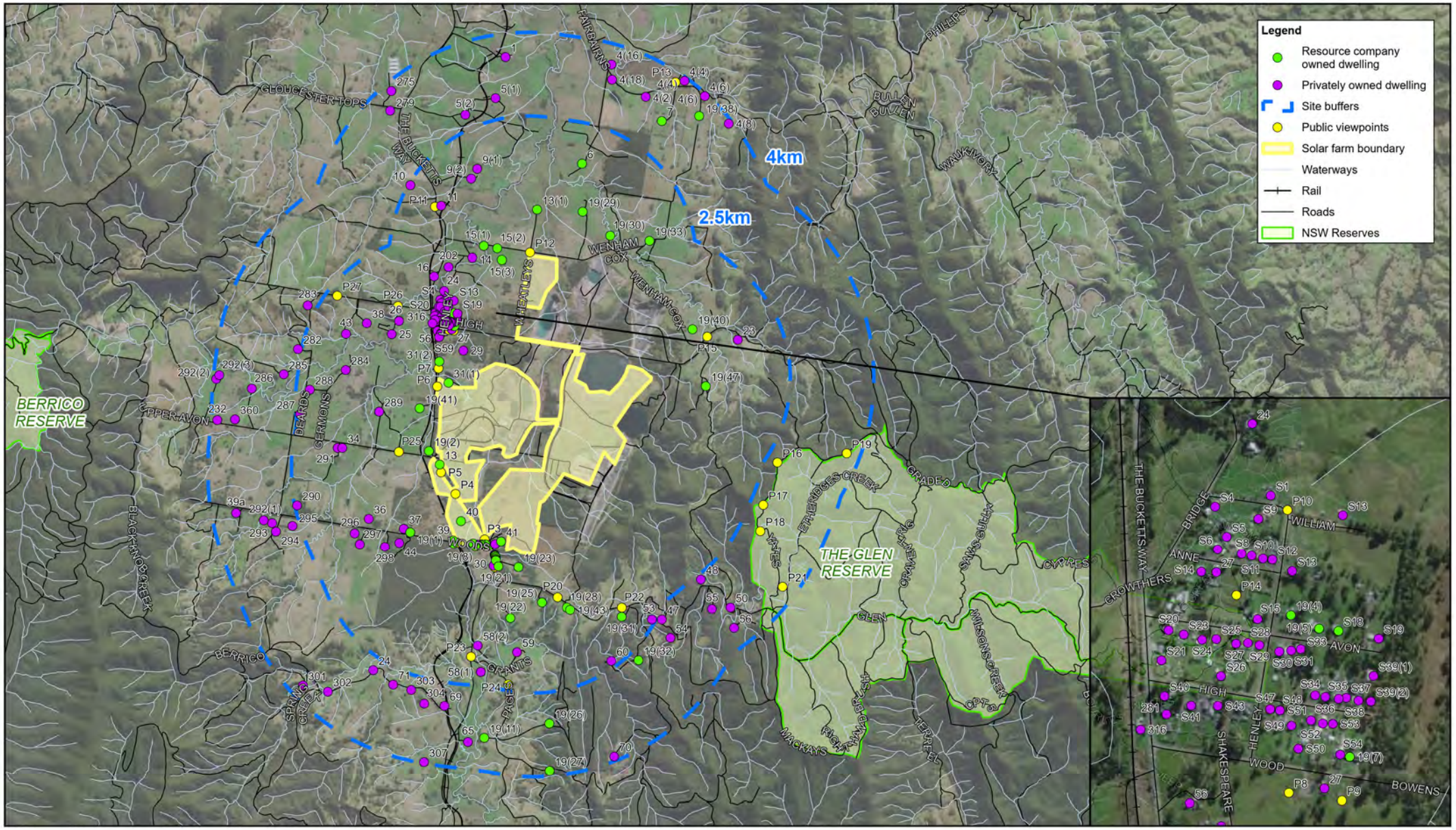
– Privately owned dwellings (including village dwellings)
– Resource company owned dwellings

Public receiver locations identified within the study area include parks and reserves, community facilities, walking tracks within The Glen Nature Reserve, and road and rail line.

A total of 207 receiver locations were included in the preliminary visual assessment, including 128 privately owned dwellings, 52 resource company owned dwellings, and 27 public receiver locations. Refer to Figure 3.1 for receiver locations.

3.1.3 Zone of theoretical visibility

A ZTV analysis was undertaken for the solar farm, using parameters outlined in section 2.2.1.3. The ZTV shows areas of visibility across the study area, however with more areas visible to the centre, north and west. A portion of Stratford village is within the area of theoretical visibility, as well as the settlement of Craven. The ZTV analysis has been incorporated into the preliminary visual assessment criteria (refer to Appendix A).



Paper Size ISO A4

0 1,000 2,000 3,000 4,000

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Yancoal Australia Limited
Stratford Renewable Energy Hub

Project No. 12604910
Revision No. -
Date 20/09/2023

Receiver locations within solar farm study area

FIGURE 3.1

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3.1.4 Preliminary visual assessment

A preliminary visual assessment was undertaken for the solar farm in accordance with the approach and parameters outlined in section 2.2.1.2. Of the 207 receiver locations included in the analysis, 138 have been identified as requiring a detailed visual assessment as part of the EIS. Of the 138 receivers, 77 are privately owned residences (including village residences), 44 are resource company owned residences, and 17 are public receiver identified viewing locations.

Refer to Table 3.1 and Figure 3.2 for receivers identified as requiring a detailed viewpoint assessment, and Appendix A for the preliminary visual assessment results.

Table 3.1 Receivers identified as requiring a detailed viewpoint assessment

Receiver ID	Receiver type	Location
11	Dwelling Privately Owned	Refer to Figure 3.2
13	Dwelling Resource Company Owned	Refer to Figure 3.2
13(1)	Dwelling Resource Company Owned	Refer to Figure 3.2
14	Dwelling Privately Owned	Refer to Figure 3.2
15(1)	Dwelling Resource Company Owned	Refer to Figure 3.2
15(2)	Dwelling Resource Company Owned	Refer to Figure 3.2
15(3)	Dwelling Resource Company Owned	Refer to Figure 3.2
16	Dwelling Privately Owned	Refer to Figure 3.2
19(1)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(10)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(12)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(13)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(14)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(15)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(16)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(17)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(18)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(19)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(2)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(20)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(21)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(22)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(23)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(25)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(28)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(29)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(30)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(33)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(39)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(4)	Dwelling Resource Company Owned	Refer to Figure 3.2

Receiver ID	Receiver type	Location
19(41)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(43)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(45)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(46)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(47)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(5)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(6)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(7)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(8)	Dwelling Resource Company Owned	Refer to Figure 3.2
19(9)	Dwelling Resource Company Owned	Refer to Figure 3.2
202	Dwelling Privately Owned	Refer to Figure 3.2
24	Dwelling Privately Owned	Refer to Figure 3.2
25	Dwelling Privately Owned	Refer to Figure 3.2
26	Dwelling Privately Owned	Refer to Figure 3.2
27	Village Fire Station	Stratford, Refer to Figure 3.2
281	Villages Dwellings	Stratford, Refer to Figure 3.2
284	Dwelling Privately Owned	Refer to Figure 3.2
288	Dwelling Privately Owned	Refer to Figure 3.2
289	Dwelling Privately Owned	Refer to Figure 3.2
29	Dwelling Privately Owned	Refer to Figure 3.2
291	Dwelling Privately Owned	Refer to Figure 3.2
296	Dwelling Privately Owned	Refer to Figure 3.2
297	Dwelling Privately Owned	Refer to Figure 3.2
298	Dwelling Privately Owned	Refer to Figure 3.2
30	Village Fire Station	Craven, Refer to Figure 3.2
31(1)	Dwelling Resource Company Owned	Refer to Figure 3.2
31(2)	Dwelling Resource Company Owned	Refer to Figure 3.2
316	Villages Dwellings	Stratford, Refer to Figure 3.2
34	Dwelling Privately Owned	Refer to Figure 3.2
36	Dwelling Privately Owned	Refer to Figure 3.2
37	Dwelling Privately Owned	Refer to Figure 3.2
38	Dwelling Privately Owned	Refer to Figure 3.2
39	Dwelling Resource Company Owned	Refer to Figure 3.2
40	Dwelling Resource Company Owned	Refer to Figure 3.2
41	Dwelling Resource Company Owned	Refer to Figure 3.2
42	Villages Dwellings	Craven, Refer to Figure 3.2
43	Dwelling Privately Owned	Refer to Figure 3.2
44	Dwelling Privately Owned	Refer to Figure 3.2
56	Villages Dwellings	Refer to Figure 3.2
6	Dwelling Resource Company Owned	Refer to Figure 3.2

Receiver ID	Receiver type	Location
9(1)	Dwelling Privately Owned	Refer to Figure 3.2
9(2)	Dwelling Privately Owned	Refer to Figure 3.2
Cr.2	Dwelling Privately Owned	Refer to Figure 3.2
Cr.7	Villages Dwellings	Craven, Refer to Figure 3.2
P1	Public	Woods Road / North Line railway crossing Refer to Figure 3.2
P10	Public	Williams Street / Henley Street, Stratford Refer to Figure 3.2
P11	Public	The Bucketts Way Refer to Figure 3.2
P12	Public	Wheatleys Road / Wenham Cox Road Refer to Figure 3.2
P14	Public	Stratford Public School Refer to Figure 3.2
P2	Public	Craven Reserve Refer to Figure 3.2
P16	Public	Yates Trail, The Glen Nature Reserve Refer to Figure 3.2
P20	Public	Glen Road Refer to Figure 3.2
P3	Public	The Bucketts Way Refer to Figure 3.2
P25	Public	Upper Avon Road Refer to Figure 3.2
P26	Public	Crowthers Road Refer to Figure 3.2
P4	Public	The Bucketts Way Refer to Figure 3.2
P5	Public	The Bucketts Way Refer to Figure 3.2
P6	Public	The Bucketts Way / North Coast Line railway Refer to Figure 3.2
P7	Public	The Bucketts Way / North Coast Line railway Refer to Figure 3.2
P8	Public	Stratford rest area / park Refer to Figure 3.2
P9	Public	Stratford Cemetery Refer to Figure 3.2
S10	Villages Dwellings	Refer to Figure 3.2
S11	Villages Dwellings	Refer to Figure 3.2
S12	Villages Dwellings	Refer to Figure 3.2
S13	Villages Dwellings	Refer to Figure 3.2
S13	Villages Dwellings	Refer to Figure 3.2
S15	Villages Dwellings	Refer to Figure 3.2

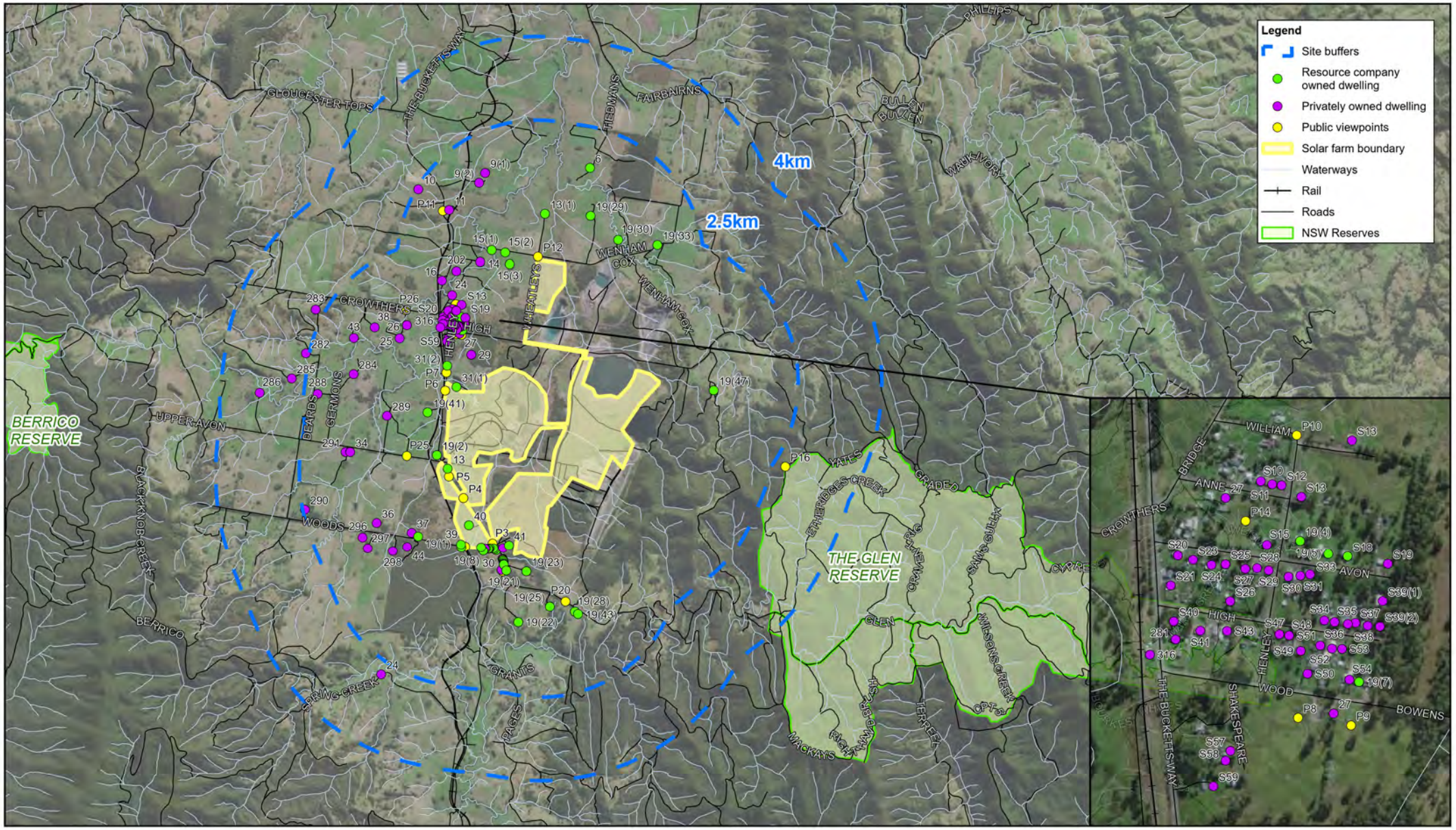
Receiver ID	Receiver type	Location
S18	Dwelling Resource Company Owned	Refer to Figure 3.2
S19	Villages Dwellings	Refer to Figure 3.2
S20	Villages Dwellings	Refer to Figure 3.2
S21	Villages Dwellings	Refer to Figure 3.2
S23	Villages Dwellings	Refer to Figure 3.2
S24	Villages Dwellings	Refer to Figure 3.2
S25	Village Church	Refer to Figure 3.2
S26	Villages Dwellings	Refer to Figure 3.2
S27	Villages Dwellings	Refer to Figure 3.2
S28	Villages Dwellings	Refer to Figure 3.2
S29	Villages Dwellings	Refer to Figure 3.2
S30	Villages Dwellings	Refer to Figure 3.2
S31	Villages Dwellings	Refer to Figure 3.2
S33	Villages Dwellings	Refer to Figure 3.2
S34	Villages Dwellings	Refer to Figure 3.2
S35	Villages Dwellings	Refer to Figure 3.2
S36	Villages Dwellings	Refer to Figure 3.2
S37	Villages Dwellings	Refer to Figure 3.2
S38	Villages Dwellings	Refer to Figure 3.2
S39(1)	Villages Dwellings	Refer to Figure 3.2
S39(2)	Villages Dwellings	Refer to Figure 3.2
S40	Villages Dwellings	Refer to Figure 3.2
S41	Villages Dwellings	Refer to Figure 3.2
S43	Villages Dwellings	Refer to Figure 3.2
S47	Villages Dwellings	Refer to Figure 3.2
S48	Villages Dwellings	Refer to Figure 3.2
S49	Villages Dwellings	Refer to Figure 3.2
S50	Villages Dwellings	Refer to Figure 3.2
S51	Villages Dwellings	Refer to Figure 3.2
S52	Villages Dwellings	Refer to Figure 3.2
S53	Villages Dwellings	Refer to Figure 3.2
S54	Villages Dwellings	Refer to Figure 3.2
S57	Villages Dwellings	Refer to Figure 3.2
S58	Villages Dwellings	Refer to Figure 3.2
S59	Villages Dwellings	Refer to Figure 3.2
10	Dwelling Privately Owned	Refer to Figure 3.2
282	Dwelling Privately Owned	Refer to Figure 3.2
283	Dwelling Privately Owned	Refer to Figure 3.2
285	Dwelling Privately Owned	Refer to Figure 3.2
286	Dwelling Privately Owned	Refer to Figure 3.2

Receiver ID	Receiver type	Location
290	Dwelling Privately Owned	Refer to Figure 3.2

3.1.5 Considerations for detailed viewpoint assessment stage

The following should be considered for the detailed viewpoint assessment stage:

– Many receivers are clustered together within close proximity, for example within Stratford and Craven, therefore it is expected that during the detailed viewpoint assessment stage, representative locations would be appropriate for assessment purposes.
– The ZTV analysis does not consider the presence of vegetation. Based on the desktop review, the extent of vegetation in the vicinity of the solar farm may block views from groups of receivers, reducing the number of detailed visual assessments required (to be determined during the EIS stage).
– Where appropriate, considerations should be given to rationalise the public viewpoint locations selected during the preliminary visual assessment stage, in locations where representative locations may be appropriate, or impacts may already be addressed by nearby viewpoint locations requiring detailed viewpoint assessment.



Paper Size ISO A4

0 1,000 2,000 3,000 4,000

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Yancoal Australia Limited
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Receiver locations requiring detailed visual assessment

Project No. **12604910**
Revision No. **-**
Date **20/09/2023**

FIGURE 3.2

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Data source: World Imagery: Earthstar Geographics
World Imagery: Maxar. Created by: kpsroba

3.2 Other infrastructure

On the eastern side of the proposed solar farm, a pumped hydro facility is proposed, which would connect an existing large dam (lower reservoir) to a new upper reservoir, located on higher elevations. The two reservoirs are proposed to be connected via a tunnel and power station. New access roads to the upper reservoir would be required, as well as support facilities such as tanks, a parking and office area, and laydown areas for construction.

An existing 132 kV transmission line traverses the Project area, which is proposed to be realigned as part of a separate project. A small section of new 32 kV transmission line would need to be constructed between the solar farm and lower reservoir as part of the Project. The transmission poles would reach a height of up to 10 m. A new substation with a 20 m high gantry also forms part of the Project.

3.2.1 Zone of theoretical visibility

A ZTV analysis has been undertaken for the pumped hydro and transmission infrastructure, using parameters outlined in section 2.2.2.1. Due to the higher elevation and greater heights of proposed infrastructure, the area of theoretical visibility is greater when compared to the solar farm. Much of the land within the valley, extending from at least 9 km to the north and 6 km to the south of the proposed upper reservoir, is within the zone of theoretical visibility, including Stratford and Craven. The ZTV is constrained by higher elevation on either side of the valley, and areas of theoretical visibility do not extend significantly within The Glen Nature Reserve. When analysing the ZTV, it should be noted that the analysis only takes into account the landform and does not include the presence of buildings and trees, therefore it represents the worst-case scenario of potential visibility.

3.2.2 Additional viewpoints for consideration

It is understood that the preliminary visual assessment in accordance with the Technical Supplement applies to the assessment of the solar farm only. Therefore, additional consideration is required for impacts associated with the pumped hydro and transmission infrastructure, where relevant.

Viewpoints identified for detailed viewpoint assessment of the solar farm within the EIS would also take into consideration impacts associated with other Project infrastructure. Where appropriate, additional viewpoints may be required, specifically where the ZTV has identified locations where receivers may experience views to the pumped hydro and not the solar farm.

Additionally, due to the nature of the existing valley topography and the elevation of the proposed upper reservoir infrastructure, the viewshed for the pumped hydro may extend beyond that of the solar farm, with additional receivers beyond the solar farm study area potentially requiring consideration of visual impacts.

Additional viewpoints for consideration associated with other infrastructure would be determined during the EIS stage. It is proposed that the assessment approach outlined in the Technical Supplement is not applicable for assessing other non-solar Project infrastructure, and a more traditional approach to assessing landscape and visual impacts at potentially impacted viewpoints would be undertaken.

4. Conclusion

This preliminary visual assessment has been prepared for the solar farm component of the Stratford Renewable Energy Hub project, to accompany the Scoping Report. A preliminary desktop overview of the study area, ZTV analysis, and preliminary assessment has been undertaken in accordance with the Technical Supplement.

Two hundred and seven (207) receiver locations were identified within a 4-km study area of the proposed solar farm, comprising of 128 privately owned dwellings, 52 resource company owned dwellings, and 27 public receiver locations. ZTV analysis was undertaken, illustrating the theoretical visibility of the solar farm. A preliminary visual assessment was undertaken for all receivers identified, with parameters including distance of receiver to the project, relative height difference, horizontal field of view, and whether the receiver is within the solar farm ZTV. The results determined that 138 receivers would require a detailed assessment as part of the EIS.

A ZTV analysis was prepared for other infrastructure, including the pumped hydro and transmission connection. As part of the EIS, landscape and visual impacts would be considered for potential impacts associated with the Project beyond the solar farm. This would include additional viewpoint assessments, and a review of the Project study area, and inclusion of other infrastructure in the landscape character assessment.

Regards

Victoria Wheatley
Senior Landscape Strategy Consultant

Appendix A

Preliminary visual analysis results

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
11	Dwelling Privately Owned	127.2	110.0	187.8	78	1818	80	71 - 130	2	Assessment required	Yes	Yes
13	Dwelling Resource Company Owned	140.8	110.0	187.8	78	50	334	130+	4	Assessment required	Yes	Yes
13(1)	Dwelling Resource Company Owned	117.3	110.0	187.8	78	832	77	71 - 130	4	Assessment required	Yes	Yes
14	Dwelling Privately Owned	114.5	110.0	187.8	78	1008	120	71 - 130	3	Assessment required	Yes	Yes
15(1)	Dwelling Resource Company Owned	117.5	110.0	187.8	78	838	110	71 - 130	4	Assessment required	Yes	Yes
15(2)	Dwelling Resource Company Owned	119.1	110.0	187.8	78	593	116	71 - 130	4	Assessment required	Yes	Yes
15(3)	Dwelling Resource Company Owned	126.2	110.0	187.8	78	479	139	130+	4	Assessment required	Yes	Yes
16	Dwelling Privately Owned	120.5	110.0	187.8	78	1634	116	71 - 130	2	Assessment required	Yes	Yes
19(1)	Dwelling Resource Company Owned	156.9	110.0	187.8	78	718	104	71 - 130	4	Assessment required	Yes	Yes
19(10)	Dwelling Resource Company Owned	134.6	110.0	187.8	78	22	209	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
19(12)	Dwelling Resource Company Owned	134.9	110.0	187.8	78	22	210	130+	4	Assessment required	Yes	Yes
19(13)	Dwelling Resource Company Owned	135.3	110.0	187.8	78	47	203	130+	4	Assessment required	Yes	Yes
19(14)	Dwelling Resource Company Owned	135.6	110.0	187.8	78	80	198	130+	4	Assessment required	Yes	Yes
19(15)	Dwelling Resource Company Owned	138.7	110.0	187.8	78	232	170	130+	4	Assessment required	Yes	Yes
19(16)	Dwelling Resource Company Owned	139.2	110.0	187.8	78	233	169	130+	4	Assessment required	Yes	Yes
19(17)	Dwelling Resource Company Owned	140.7	110.0	187.8	78	252	162	130+	4	Assessment required	Yes	Yes
19(18)	Dwelling Resource Company Owned	141.3	110.0	187.8	78	266	158	130+	4	Assessment required	Yes	Yes
19(19)	Dwelling Resource Company Owned	141.5	110.0	187.8	78	272	157	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
19(2)	Dwelling Resource Company Owned	131.6	110.0	187.8	78	153	181	130+	4	Assessment required	Yes	Yes
19(20)	Dwelling Resource Company Owned	139.8	110.0	187.8	78	237	166	130+	4	Assessment required	Yes	Yes
19(21)	Dwelling Resource Company Owned	142.0	110.0	187.8	78	333	142	130+	4	Assessment required	Yes	Yes
19(22)	Dwelling Resource Company Owned	137.7	110.0	187.8	78	1198	81	71 - 130	3	Assessment required	Yes	Yes
19(23)	Dwelling Resource Company Owned	145.1	110.0	187.8	78	273	128	71 - 130	4	Assessment required	Yes	Yes
19(25)	Dwelling Resource Company Owned	148.1	110.0	187.8	78	883	94	71 - 130	4	Assessment required	Yes	Yes
19(28)	Dwelling Resource Company Owned	169.4	110.0	187.8	78	1133	92	71 - 130	3	Assessment required	Yes	Yes
19(29)	Dwelling Resource Company Owned	114.2	110.0	187.8	78	973	85	71 - 130	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
19(30)	Dwelling Resource Company Owned	122.6	110.0	187.8	78	1050	105	71 - 130	3	Assessment required	Yes	Yes
19(33)	Dwelling Resource Company Owned	131.5	110.0	187.8	78	1697	96	71 - 130	2	Assessment required	Yes	Yes
19(39)	Dwelling Resource Company Owned	134.3	110.0	187.8	78	34	205	130+	4	Assessment required	Yes	Yes
19(4)	Dwelling Resource Company Owned	126.0	110.0	187.8	78	1221	144	130+	3	Assessment required	Yes	Yes
19(41)	Dwelling Resource Company Owned	126.6	110.0	187.8	78	331	148	130+	4	Assessment required	Yes	Yes
19(43)	Dwelling Resource Company Owned	170.6	110.0	187.8	78	1200	90	71 - 130	3	Assessment required	Yes	Yes
19(45)	Dwelling Resource Company Owned	132.6	110.0	187.8	78	17	219	130+	4	Assessment required	Yes	Yes
19(46)	Dwelling Resource Company Owned	133.8	110.0	187.8	78	38	205	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
19(47)	Dwelling Resource Company Owned	250.4	110.0	187.8	140	992	97	71 - 130	4	Assessment required	Yes	Yes
19(5)	Dwelling Resource Company Owned	126.2	110.0	187.8	78	1179	148	130+	3	Assessment required	Yes	Yes
19(6)	Dwelling Resource Company Owned	136.0	110.0	187.8	78	73	128	71 - 130	4	Assessment required	Yes	Yes
19(7)	Dwelling Resource Company Owned	126.7	110.0	187.8	78	937	161	130+	4	Assessment required	Yes	Yes
19(8)	Dwelling Resource Company Owned	133.4	110.0	187.8	78	70	186	130+	4	Assessment required	Yes	Yes
19(9)	Dwelling Resource Company Owned	134.5	110.0	187.8	78	38	202	130+	4	Assessment required	Yes	Yes
202	Dwelling Privately Owned	117.6	110.0	187.8	78	1404	115	71 - 130	2	Assessment required	Yes	Yes
24	Dwelling Privately Owned	115.7	110.0	187.8	78	1414	129	71 - 130	2	Assessment required	Yes	Yes
25	Dwelling Privately Owned	140.0	110.0	187.8	78	1171	116	71 - 130	3	Assessment required	Yes	Yes
26	Dwelling Privately Owned	128.1	110.0	187.8	78	1263	117	71 - 130	3	Assessment required	Yes	Yes
27	Village Fire Station	127.1	110.0	187.8	78	906	160	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
281	Villages Dwellings	122.3	110.0	187.8	78	1026	139	130+	3	Assessment required	Yes	Yes
284	Dwelling Privately Owned	134.3	110.0	187.8	78	1685	101	71 - 130	2	Assessment required	Yes	Yes
288	Dwelling Privately Owned	137.9	110.0	187.8	78	2274	90	71 - 130	2	Assessment required	Yes	Yes
289	Dwelling Privately Owned	133.5	110.0	187.8	78	1043	117	71 - 130	3	Assessment required	Yes	Yes
29	Dwelling Privately Owned	127.8	110.0	187.8	78	474	198	130+	4	Assessment required	Yes	Yes
291	Dwelling Privately Owned	138.0	110.0	187.8	78	1686	96	71 - 130	2	Assessment required	Yes	Yes
296	Dwelling Privately Owned	158.2	110.0	187.8	78	1655	80	71 - 130	2	Assessment required	Yes	Yes
297	Dwelling Privately Owned	161.6	110.0	187.8	78	1644	80	71 - 130	2	Assessment required	Yes	Yes
298	Dwelling Privately Owned	151.3	110.0	187.8	78	1239	87	71 - 130	3	Assessment required	Yes	Yes
30	Village Fire Station	142.3	110.0	187.8	78	370	143	130+	4	Assessment required	Yes	Yes
31(1)	Dwelling Resource Company Owned	128.9	110.0	187.8	78	25	270	130+	4	Assessment required	Yes	Yes
31(2)	Dwelling Resource Company Owned	127.7	110.0	187.8	78	308	157	130+	4	Assessment required	Yes	Yes
316	Villages Dwellings	119.5	110.0	187.8	78	1002	138	130+	3	Assessment required	Yes	Yes
34	Dwelling Privately Owned	138.7	110.0	187.8	78	1604	97	71 - 130	2	Assessment required	Yes	Yes

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36	Dwelling Privately Owned	156.4	110.0	187.8	78	1318	90	71 - 130	3	Assessment required	Yes	Yes
37	Dwelling Privately Owned	152.5	110.0	187.8	78	808	103	71 - 130	4	Assessment required	Yes	Yes
38	Dwelling Privately Owned	145.1	110.0	187.8	78	1640	102	71 - 130	2	Assessment required	Yes	Yes
39	Dwelling Resource Company Owned	136.8	110.0	187.8	78	59	144	130+	4	Assessment required	Yes	Yes
40	Dwelling Resource Company Owned	132.9	110.0	187.8	78	183	360	130+	4	Assessment required	Yes	Yes
41	Dwelling Resource Company Owned	144.1	110.0	187.8	78	124	257	130+	4	Assessment required	Yes	Yes
42	Villages Dwellings	139.7	110.0	187.8	78	187	222	130+	4	Assessment required	Yes	Yes
43	Dwelling Privately Owned	147.8	110.0	187.8	78	1860	97	71 - 130	2	Assessment required	Yes	Yes
44	Dwelling Privately Owned	157.7	110.0	187.8	78	973	93	71 - 130	4	Assessment required	Yes	Yes
56	Villages Dwellings	120.5	110.0	187.8	78	857	145	130+	4	Assessment required	Yes	Yes
6	Dwelling Resource Company Owned	121.4	110.0	187.8	78	1774	64	61 - 70	2	Assessment required	Yes	Yes
9(1)	Dwelling Privately Owned	123.9	110.0	187.8	78	1814	64	61 - 70	2	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
9(2)	Dwelling Privately Owned	126.1	110.0	187.8	78	1730	68	61 - 70	2	Assessment required	Yes	Yes
Cr.2	Dwelling Privately Owned	133.4	110.0	187.8	78	40	206	130+	4	Assessment required	Yes	Yes
Cr.7	Villages Dwellings	138.2	110.0	187.8	78	232	173	130+	4	Assessment required	Yes	Yes
P1	Public	135.1	110.0	187.8	78	5	133	130+	4	Assessment required	Yes	Yes
P10	Public	118.8	110.0	187.8	78	1323	137	130+	3	Assessment required	Yes	Yes
P11	Public	127.6	110.0	187.8	78	1908	80	71 - 130	2	Assessment required	Yes	Yes
P12	Public	109.8	110.0	187.8	78	55	123	71 - 130	4	Assessment required	Yes	Yes
P14	Public	123.8	110.0	187.8	78	1249	138	130+	3	Assessment required	Yes	Yes
P2	Public	141.7	110.0	187.8	78	380	139	130+	4	Assessment required	Yes	Yes
P16	Public	432.8	110.0	187.8	323	2712	75	71 - 130	4	Assessment required	Yes	Yes
P20	Public	158.2	110.0	187.8	78	891	96	71 - 130	4	Assessment required	Yes	Yes
P3	Public	134.6	110.0	187.8	78	12	281	130+	4	Assessment required	Yes	Yes
P25	Public	145.0	110.0	187.8	78	602	130	71 - 130	4	Assessment required	Yes	Yes
P26	Public	123.1	110.0	187.8	78	1500	112	71 - 130	2	Assessment required	Yes	Yes
P4	Public	129.6	110.0	187.8	78	10	355	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
P5	Public	137.8	110.0	187.8	78	11	349	130+	4	Assessment required	Yes	Yes
P6	Public	121.3	110.0	187.8	78	15	180	130+	4	Assessment required	Yes	Yes
P7	Public	126.1	110.0	187.8	78	185	158	130+	4	Assessment required	Yes	Yes
P8	Public	126.8	110.0	187.8	78	889	154	130+	4	Assessment required	Yes	Yes
P9	Public	126.1	110.0	187.8	78	871	163	130+	4	Assessment required	Yes	Yes
S10	Villages Dwellings	121.2	110.0	187.8	78	1326	137	130+	3	Assessment required	Yes	Yes
S11	Villages Dwellings	121.7	110.0	187.8	78	1322	138	130+	3	Assessment required	Yes	Yes
S12	Villages Dwellings	121.8	110.0	187.8	78	1321	139	130+	3	Assessment required	Yes	Yes
S13	Villages Dwellings	120.1	110.0	187.8	78	1218	143	130+	3	Assessment required	Yes	Yes
S13	Villages Dwellings	123.5	110.0	187.8	78	1296	142	130+	3	Assessment required	Yes	Yes
S15	Villages Dwellings	125.9	110.0	187.8	78	1207	141	130+	3	Assessment required	Yes	Yes
S18	Dwelling Resource Company Owned	125.3	110.0	187.8	78	1158	151	130+	3	Assessment required	Yes	Yes
S19	Villages Dwellings	122.7	110.0	187.8	78	1111	156	130+	3	Assessment required	Yes	Yes
S20	Villages Dwellings	124.6	110.0	187.8	78	1184	135	130+	3	Assessment required	Yes	Yes

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S21	Villages Dwellings	125.4	110.0	187.8	78	1128	136	130+	3	Assessment required	Yes	Yes
S23	Villages Dwellings	125.3	110.0	187.8	78	1174	137	130+	3	Assessment required	Yes	Yes
S24	Villages Dwellings	125.7	110.0	187.8	78	1164	138	130+	3	Assessment required	Yes	Yes
S25	Village Church	125.8	110.0	187.8	78	1165	139	130+	3	Assessment required	Yes	Yes
S26	Villages Dwellings	125.9	110.0	187.8	78	1096	141	130+	3	Assessment required	Yes	Yes
S27	Villages Dwellings	126.5	110.0	187.8	78	1158	141	130+	3	Assessment required	Yes	Yes
S28	Villages Dwellings	126.8	110.0	187.8	78	1161	142	130+	3	Assessment required	Yes	Yes
S29	Villages Dwellings	127.5	110.0	187.8	78	1158	143	130+	3	Assessment required	Yes	Yes
S30	Villages Dwellings	127.9	110.0	187.8	78	1150	145	130+	3	Assessment required	Yes	Yes
S31	Villages Dwellings	127.7	110.0	187.8	78	1155	146	130+	3	Assessment required	Yes	Yes
S33	Villages Dwellings	127.4	110.0	187.8	78	1160	147	130+	3	Assessment required	Yes	Yes
S34	Villages Dwellings	127.9	110.0	187.8	78	1070	152	130+	3	Assessment required	Yes	Yes
S35	Villages Dwellings	127.2	110.0	187.8	78	1059	154	130+	3	Assessment required	Yes	Yes
S36	Villages Dwellings	126.4	110.0	187.8	78	1044	155	130+	3	Assessment required	Yes	Yes
S37	Villages Dwellings	125.9	110.0	187.8	78	1039	156	130+	3	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
S38	Villages Dwellings	125.1	110.0	187.8	78	1024	158	130+	3	Assessment required	Yes	Yes
S39(1)	Villages Dwellings	123.5	110.0	187.8	78	1053	159	130+	3	Assessment required	Yes	Yes
S39(2)	Villages Dwellings	124.3	110.0	187.8	78	1012	160	130+	3	Assessment required	Yes	Yes
S40	Villages Dwellings	124.1	110.0	187.8	78	1060	138	130+	3	Assessment required	Yes	Yes
S41	Villages Dwellings	123.0	110.0	187.8	78	1040	140	130+	3	Assessment required	Yes	Yes
S43	Villages Dwellings	123.9	110.0	187.8	78	1040	142	130+	3	Assessment required	Yes	Yes
S47	Villages Dwellings	126.5	110.0	187.8	78	1040	147	130+	3	Assessment required	Yes	Yes
S48	Villages Dwellings	127.0	110.0	187.8	78	1040	149	130+	3	Assessment required	Yes	Yes
S49	Villages Dwellings	127.3	110.0	187.8	78	1015	151	130+	3	Assessment required	Yes	Yes
S50	Villages Dwellings	127.2	110.0	187.8	78	974	153	130+	4	Assessment required	Yes	Yes
S51	Villages Dwellings	127.8	110.0	187.8	78	1031	153	130+	3	Assessment required	Yes	Yes
S52	Villages Dwellings	127.7	110.0	187.8	78	1016	155	130+	3	Assessment required	Yes	Yes
S53	Villages Dwellings	127.3	110.0	187.8	78	1007	156	130+	3	Assessment required	Yes	Yes
S54	Villages Dwellings	127.3	110.0	187.8	78	949	160	130+	4	Assessment required	Yes	Yes
S57	Villages Dwellings	122.8	110.0	187.8	78	814	148	130+	4	Assessment required	Yes	Yes

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
S58	Villages Dwellings	122.7	110.0	187.8	78	795	148	130+	4	Assessment required	Yes	Yes
S59	Villages Dwellings	121.9	110.0	187.8	78	746	148	130+	4	Assessment required	Yes	Yes
10	Dwelling Privately Owned	153.9	110.0	187.8	78	2482	71	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
282	Dwelling Privately Owned	150.4	110.0	187.8	78	2593	85	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
283	Dwelling Privately Owned	200.9	110.0	187.8	91	2704	83	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
285	Dwelling Privately Owned	153.3	110.0	187.8	78	2770	82	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
286	Dwelling Privately Owned	141.1	110.0	187.8	78	3314	75	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
290	Dwelling Privately Owned	155.0	110.0	187.8	78	2479	71	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	Yes
P27	Public	189.8	110.0	187.8	80	2361	88	71 - 130	1	Assessment required for all viewpoints except road/rail	Yes	No

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
19(31)	Dwelling Resource Company Owned	210.0	110.0	187.8	100	1946	85	71 - 130	2	Assessment required	No	No
19(40)	Dwelling Resource Company Owned	167.0	110.0	187.8	78	1141	99	71 - 130	3	Assessment required	No	No
23	Dwelling Privately Owned	162.8	110.0	187.8	78	1698	82	71 - 130	2	Assessment required	No	No
27	Villages Dwellings	121.4	110.0	187.8	78	1292	136	130+	3	Assessment required	No	No
48	Dwelling Privately Owned	250.3	110.0	187.8	140	2592	80	71 - 130	2	Assessment required	No	No
55	Dwelling Privately Owned	232.1	110.0	187.8	122	3140	73	71 - 130	2	Assessment required	No	No
58(2)	Dwelling Privately Owned	98.4	110.0	187.8	89	1798	64	61 - 70	2	Assessment required	No	No
59	Dwelling Privately Owned	96.2	110.0	187.8	92	1785	68	61 - 70	2	Assessment required	No	No
P15	Public	141.4	110.0	187.8	78	1246	93	71 - 130	3	Assessment required	No	No
P17	Public	406.6	110.0	187.8	297	2736	74	71 - 130	4	Assessment required	No	No
P18	Public	382.9	110.0	187.8	273	2877	73	71 - 130	4	Assessment required	No	No
P19	Public	378.3	110.0	187.8	268	3754	64	61 - 70	3	Assessment required	No	No
P22	Public	190.9	110.0	187.8	81	1858	88	71 - 130	2	Assessment required	No	No
P23	Public	91.6	110.0	187.8	96	2019	61	61 - 70	2	Assessment required	No	No

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S1	Villages Dwellings	116.6	110.0	187.8	78	1359	135	130+	2	Assessment required	No	No
S14	Villages Dwellings	121.0	110.0	187.8	78	1293	135	130+	3	Assessment required	No	No
S4	Villages Dwellings	115.6	110.0	187.8	78	1416	132	130+	2	Assessment required	No	No
S5	Villages Dwellings	118.4	110.0	187.8	78	1359	134	130+	2	Assessment required	No	No
S6	Villages Dwellings	119.3	110.0	187.8	78	1335	134	130+	3	Assessment required	No	No
S8	Villages Dwellings	120.5	110.0	187.8	78	1328	136	130+	3	Assessment required	No	No
S9	Villages Dwellings	118.2	110.0	187.8	78	1375	135	130+	2	Assessment required	No	No
19(32)	Dwelling Resource Company Owned	178.7	110.0	187.8	78	2684	72	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No
287	Dwelling Privately Owned	143.0	110.0	187.8	78	2454	86	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No
47	Dwelling Privately Owned	175.1	110.0	187.8	78	2592	79	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No
53	Dwelling Privately Owned	167.4	110.0	187.8	78	2433	80	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No

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54	Dwelling Privately Owned	159.3	110.0	187.8	78	2885	74	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No
58(1)	Dwelling Privately Owned	93.2	110.0	187.8	95	2243	59	51 - 60	2	Assessment required for all viewpoints except road/rail	No	No
60	Dwelling Privately Owned	160.0	110.0	187.8	78	2376	73	71 - 130	1	Assessment required for all viewpoints except road/rail	No	No
1	Dwelling Privately Owned	121.6	110.0	187.8	78	3584	48	41 - 50	1	No assessment required	Yes	No
19(11)	Dwelling Resource Company Owned	102.3	110.0	187.8	86	3399	49	41 - 50	1	No assessment required	No	No
19(26)	Dwelling Resource Company Owned	149.8	110.0	187.8	78	3056	56	51 - 60	1	No assessment required	Yes	No
19(27)	Dwelling Resource Company Owned	148.1	110.0	187.8	78	3902	49	41 - 50	1	No assessment required	Yes	No
19(38)	Dwelling Resource Company Owned	138.8	110.0	187.8	78	3625	53	51 - 60	1	No assessment required	Yes	No
232	Dwelling Privately Owned	161.7	110.0	187.8	78	3902	67	61 - 70	1	No assessment required	Yes	No
24	Dwelling Privately Owned	119.7	110.0	187.8	78	2753	54	51 - 60	1	No assessment required	No	No

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
275	Dwelling Privately Owned	154.8	110.0	187.8	78	3853	51	51 - 60	1	No assessment required	Yes	No
279	Dwelling Privately Owned	158.9	110.0	187.8	78	3605	54	51 - 60	1	No assessment required	Yes	No
292(1)	Dwelling Privately Owned	155.2	110.0	187.8	78	3127	63	61 - 70	1	No assessment required	No	No
292(2)	Dwelling Privately Owned	144.5	110.0	187.8	78	3963	68	61 - 70	1	No assessment required	Yes	No
292(3)	Dwelling Privately Owned	143.8	110.0	187.8	78	3916	68	61 - 70	1	No assessment required	Yes	No
293	Dwelling Privately Owned	164.5	110.0	187.8	78	2995	64	61 - 70	1	No assessment required	Yes	No
294	Dwelling Privately Owned	169.3	110.0	187.8	78	2972	63	61 - 70	1	No assessment required	Yes	No
295	Dwelling Privately Owned	156.9	110.0	187.8	78	2657	66	61 - 70	1	No assessment required	Yes	No
301	Dwelling Privately Owned	123.0	110.0	187.8	78	3785	49	41 - 50	1	No assessment required	No	No
302	Dwelling Privately Owned	120.0	110.0	187.8	78	3555	49	41 - 50	1	No assessment required	No	No
303	Dwelling Privately Owned	125.7	110.0	187.8	78	2784	50	41 - 50	1	No assessment required	Yes	No
304	Dwelling Privately Owned	114.5	110.0	187.8	78	2964	49	41 - 50	1	No assessment required	Yes	No
307	Dwelling Privately Owned	109.6	110.0	187.8	78	3998	44	41 - 50	1	No assessment required	Yes	No
360	Dwelling Privately Owned	157.4	110.0	187.8	78	3593	70	61 - 70	1	No assessment required	Yes	No
39a	Dwelling Privately Owned	175.5	110.0	187.8	78	3575	61	61 - 70	1	No assessment required	Yes	No

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
4(16)	Dwelling Privately Owned	114.6	110.0	187.8	78	3630	48	41 - 50	1	No assessment required	No	No
4(18)	Dwelling Privately Owned	119.4	110.0	187.8	78	3372	50	41 - 50	1	No assessment required	Yes	No
4(2)	Dwelling Privately Owned	108.7	110.0	187.8	79	3324	50	41 - 50	1	No assessment required	No	No
4(4)	Dwelling Privately Owned	111.3	110.0	187.8	78	3938	48	41 - 50	1	No assessment required	No	No
4(6)	Dwelling Privately Owned	127.4	110.0	187.8	78	3953	49	41 - 50	1	No assessment required	No	No
4(8)	Dwelling Privately Owned	149.0	110.0	187.8	78	3931	52	51 - 60	1	No assessment required	No	No
5(1)	Dwelling Privately Owned	113.9	110.0	187.8	78	2885	53	51 - 60	1	No assessment required	Yes	No
5(2)	Dwelling Privately Owned	128.0	110.0	187.8	78	2774	54	51 - 60	1	No assessment required	Yes	No
50	Dwelling Privately Owned	201.1	110.0	187.8	91	3316	70	61 - 70	1	No assessment required	No	No
56	Dwelling Privately Owned	207.7	110.0	187.8	98	3647	67	61 - 70	1	No assessment required	No	No
65	Dwelling Privately Owned	87.6	110.0	187.8	100	3521	48	41 - 50	1	No assessment required	No	No
69	Dwelling Privately Owned	101.8	110.0	187.8	86	2945	51	51 - 60	1	No assessment required	No	No
7	Dwelling Resource Company Owned	123.3	110.0	187.8	78	3115	55	51 - 60	1	No assessment required	No	No
70	Dwelling Privately Owned	197.1	110.0	187.8	87	3914	54	51 - 60	1	No assessment required	Yes	No

Receiver ID	Receiver type	Elevation of receiver (mAHD)	Lowest point of design (mAHD)	Highest point of design (mAHD)	Relative height difference	Distance to design (m)	Horizontal field of view	Horizontal field of view category	Sector (prelim tool DPE)	Assessment	Within ZTV?	Detailed assessment required?
71	Dwelling Privately Owned	118.8	110.0	187.8	78	2810	51	51 - 60	1	No assessment required	No	No
P13	Public	110.5	110.0	187.8	78	3826	48	41 - 50	1	No assessment required	No	No
P21	Public	221.9	110.0	187.8	112	3738	63	61 - 70	1	No assessment required	No	No
P24	Public	128.9	110.0	187.8	78	2381	58	51 - 60	1	No assessment required	Yes	No