



Australian Government

BUILDING OUR FUTURE



M1 Pacific Motorway extension to Raymond Terrace

Land Use and Property Working Paper

Transport for NSW | July 2021



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Executive summary

Background

Transport for New South Wales (Transport) proposes to construct the M1 Pacific Motorway extension to Raymond Terrace (the project). Approval is sought under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Performance outcomes

This assessment has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSI 7319) relating to land use and property of key SEAR 12 Socio-economic, land use and property. In relation to land use and property, the desired performance outcomes are that the project:

- Minimises impacts to property and businesses and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure
- Effectively engages with stakeholders during project design and delivery.

Further information to address SEAR 12 is also provided in the Socio-economic Working Paper (Appendix M of the EIS).

Overview of land use and property impacts

Once operational, the project would enhance access and connectivity to the M1 Pacific Motorway and Pacific Highway, allowing more efficient and safer access for residents, workers, businesses and freight, whilst supporting future growth, land use and development of these areas and the wider Hunter region.

Potential impacts on land use and property from the project would mainly be associated with property acquisition, temporary lease of land to support construction activities, and direct and indirect impacts on land uses within and surrounding the project. Specifically, the project would result in the following land use and property impacts:

- Property acquisition impacts:
 - To date, 43 lots have been progressively purchased by Transport for the project, which are held over several properties by private landowners and local councils. About 43 per cent of property affected by the construction footprint is currently owned by Transport
 - An additional 36 lots held by 18 property owners would need to be acquired for the project, in addition to those previously purchased by Transport
 - Temporary leases of land would also be required to accommodate construction work, with up to an additional seven properties (comprising nine lots) subject to temporary lease only
 - The project would directly impact two dwellings on rural land, including one within land proposed for AGL's gas fired power station (the proposed power station), which would be removed as part of the proposed power station development if construction proceeds within the expected timeframe
 - The project would directly impact one dwelling associated with a commercial property at Heatherbrae
 - An additional dwelling, located within the project's construction footprint at Tarro, next to the ancillary facility (AS5), would not be directly impacted by the project, but the residents of this property may be required to temporarily relocate during the construction phase.

The project has been designed to minimise the potential for partial acquisition of land to result in severance or fragmentation of rural properties. The viaduct across the Hunter River floodplain at Tarro

and Woodberry would allow access to be maintained within and between properties located either side of the project. Access to residual property parcels would be maintained via existing local roads or new service roads constructed as part of the project.

- Land use impacts:
 - Potential land use impacts would mainly be associated with direct impacts on land use (temporary and permanent), changes in amenity for some land uses along the existing Pacific Highway or near the project, and temporary and permanent changes in property access
 - The construction footprint for the project would directly impact about 465.6 hectares of land, of which about 300 hectares would be permanently impacted by the operational footprint
 - Existing transport and communication uses comprise about 94 hectares of land within the construction footprint and 79 hectares of land within the operational footprint, the majority of which is existing road corridors
 - Permanent land use change would occur to land within the operational footprint, with about 216 hectares of existing land uses changing to transport infrastructure, increasing the footprint of transport infrastructure within the study area from about 237 hectares to about 450 hectares. Other land uses impacted by the project include conservation and environmental uses, primary production, manufacturing and industrial uses, residential uses, service related uses, utilities, and water resources uses
 - Utilities would need to be relocated, adjusted or protected where they may be affected by project construction, particularly in areas where ground disturbance would be required. This work would be carried out in consultation with the relevant service provider to minimise any service disruptions.

During operation, access would be maintained to individual properties near the project, either from existing roads or new access roads and tracks provided as part of the project. Permanent adjustments would be required to some private properties for the project, including adjustments to fencing and other infrastructure, due to partial property acquisition. Potential impacts may occur for properties near the project due to changes in local amenity related to visual impacts, increased traffic noise and changes to air quality. General impacts on existing land uses from the operation of the project are expected to be minor.

Summary of environmental management measures

Environmental management measures will be implemented to mitigate or manage land use and property impacts. These include:

- Provide appropriate compensation for property acquisition in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and the 2016 policy reforms
- Carry out property adjustments, including replacement of farm infrastructure such as fencing and property access adjustments prior to construction and in consultation with the property owner
- Consult with utility owners and/or providers prior to construction commencing, to determine the requirements for access to, protection of, or relocation of services and to minimise disruption.

Conclusions

Potential impacts on land use from the construction and operation of the project are expected to be low given the project mainly passes within or near to existing road and infrastructure corridors or through rural areas used for grazing. The project would result in a permanent change in land use to transport infrastructure of about 216 hectares of land. However, the land uses affected by the project are well represented within the City of Newcastle and Port Stephens Council local government areas and make up a relatively small proportion of these land uses. Accordingly, the project would not be expected to impact on the overall availability of these land uses.

Contents

| | |
|---|------------|
| Executive summary | i |
| Contents | iii |
| 1. Introduction | 1 |
| 1.1 Background..... | 1 |
| 1.2 Project description | 1 |
| 1.3 Performance outcomes | 5 |
| 1.4 Secretary’s Environmental Assessment Requirements | 5 |
| 1.5 Report structure | 7 |
| 2. Policy and planning setting | 8 |
| 2.1 New South Wales | 8 |
| 2.2 Local government | 12 |
| 2.3 Guidelines..... | 14 |
| 3. Assessment methodology | 16 |
| 3.1 Methodology | 16 |
| 4. Existing environment | 21 |
| 4.1 Regional land use context..... | 21 |
| 4.2 Property | 22 |
| 4.3 Existing land uses | 22 |
| 4.4 Land use zoning..... | 29 |
| 4.5 Mining..... | 36 |
| 4.6 Utilities | 37 |
| 4.7 Water users | 41 |
| 4.8 Future land use | 41 |
| 5. Assessment of potential impacts | 43 |
| 5.1 Property | 43 |
| 5.2 Impacts on existing land uses | 57 |
| 5.3 Land use zoning..... | 61 |
| 5.4 Mining..... | 64 |
| 5.5 Utilities | 65 |
| 5.6 Water users | 67 |
| 5.7 Future land use | 68 |
| 5.8 Evaluation of potential land use conflict risks | 69 |
| 6. Cumulative impacts | 70 |
| 7. Environmental management measures | 73 |
| 7.1 Expected environmental outcomes | 73 |
| 7.2 Expected effectiveness | 73 |
| 8. Conclusion | 75 |
| References | 76 |
| Terms and acronyms | 78 |

List of tables

| | |
|--|----|
| Table 1-1 SEARs relevant to land use and property | 5 |
| Table 4-1 Land use zone objectives | 32 |
| Table 4-2 Mining leases..... | 36 |
| Table 4-3 Water access licences registered within one kilometre of the project | 41 |
| Table 5-1 Summary of properties to be acquired or leased..... | 46 |
| Table 5-2 Properties with access changes during construction and operation | 55 |
| Table 5-3 Impact on land zoning in the study area..... | 62 |
| Table 5-4 Summary of utility impacts | 65 |
| Table 6-1 Assessment of potential cumulative impacts for relevant identified projects..... | 70 |
| Table 7-1 Environmental management measures..... | 74 |

List of figures

| | |
|---|----|
| Figure 1-1 Regional context of the project | 2 |
| Figure 1-2 Project key features..... | 3 |
| Figure 2-1 Hunter Regional Plan 2036 – Greater Newcastle..... | 9 |
| Figure 2-2 Greater Newcastle Metropolitan Plan 2036..... | 11 |
| Figure 3-1 Study area..... | 17 |
| Figure 3-2 Construction and operational footprints | 18 |
| Figure 4-1 Land tenure within the study area | 23 |
| Figure 4-2 Existing land use within the study area | 27 |
| Figure 4-3 Land use zones within the study area..... | 30 |
| Figure 4-4 Mining activities within the study area..... | 38 |
| Figure 4-5 Major utilities within the study area | 39 |
| Figure 5-1 Properties to be acquired or leased | 49 |

Appendices

| | |
|------------|-----------------------------------|
| Appendix A | Existing land use categories |
| Appendix B | Land use zoning |
| Appendix C | Land use conflict risk assessment |

1. Introduction

1.1 Background

Transport for New South Wales (Transport) proposes to construct the M1 Pacific Motorway extension to Raymond Terrace (the project). Approval is sought under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The project would connect the existing M1 Pacific Motorway at Black Hill and the Pacific Highway at Raymond Terrace within the City of Newcastle and Port Stephens Council local government areas (LGAs). The project would provide regional benefits and substantial productivity benefits on a national scale. The **Figure 1-1** within its regional context.

1.2 Project description

The project would include the following key features:

- A 15 kilometre motorway comprised of a four lane divided road (two lanes in each direction)
- Motorway access from the existing road network via four new interchanges at:
 - Black Hill: connection to the M1 Pacific Motorway
 - Tarro: connection and upgrade (six lanes) to the New England Highway between John Renshaw Drive and the existing Tarro interchange at Anderson Drive
 - Tomago: connection to the Pacific Highway and Old Punt Road
 - Raymond Terrace: connection to the Pacific Highway.
- A 2.6 kilometre viaduct over the Hunter River flood plain including new bridge crossings over the Hunter River, the Main North Rail Line and the New England Highway
- Bridge structures over local waterways at Tarro and Raymond Terrace, and an overpass for Masonite Road in Heatherbrae
- Connections and modifications to the adjoining local road network
- Traffic management facilities and features
- Roadside furniture including safety barriers, signage, fauna fencing and crossings and street lighting
- Adjustment of waterways, including at Purgatory Creek at Tarro and a tributary of Viney Creek
- Environmental management measures including surface water quality control measures
- Adjustment, protection and/or relocation of existing utilities
- Walking and cycling considerations, allowing for existing and proposed cycleway route access
- Permanent and temporary property adjustments and property access refinements
- Construction activities, including establishment and use of temporary ancillary facilities, temporary access tracks, haul roads, batching plants, temporary wharves, soil treatment and environmental controls.

A detailed project description is provided in Chapter 5 of the environmental impact statement (EIS). The locality of the project is shown in **Figure 1-1**, while an overview of the project is shown in **Figure 1-2**.

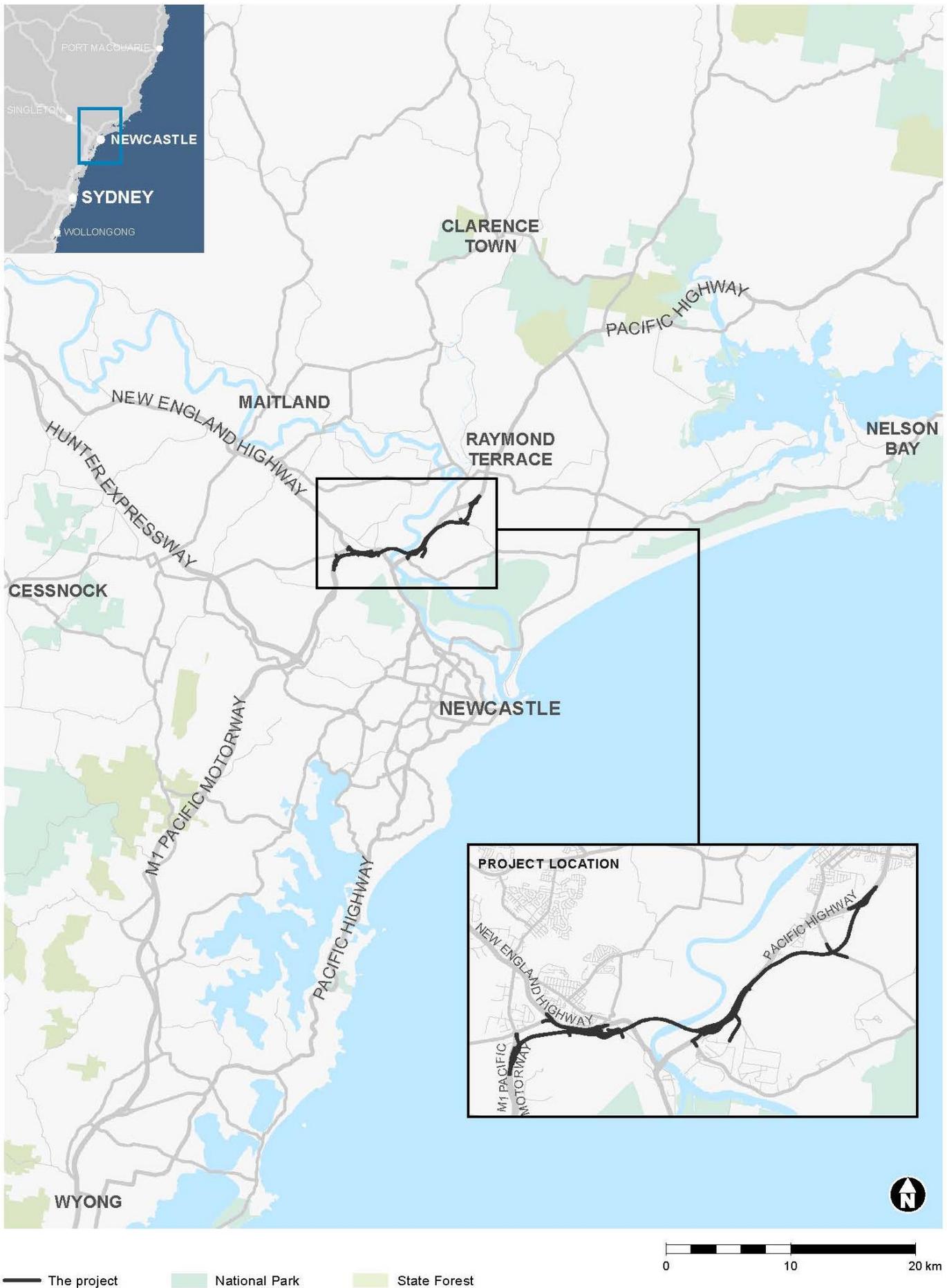
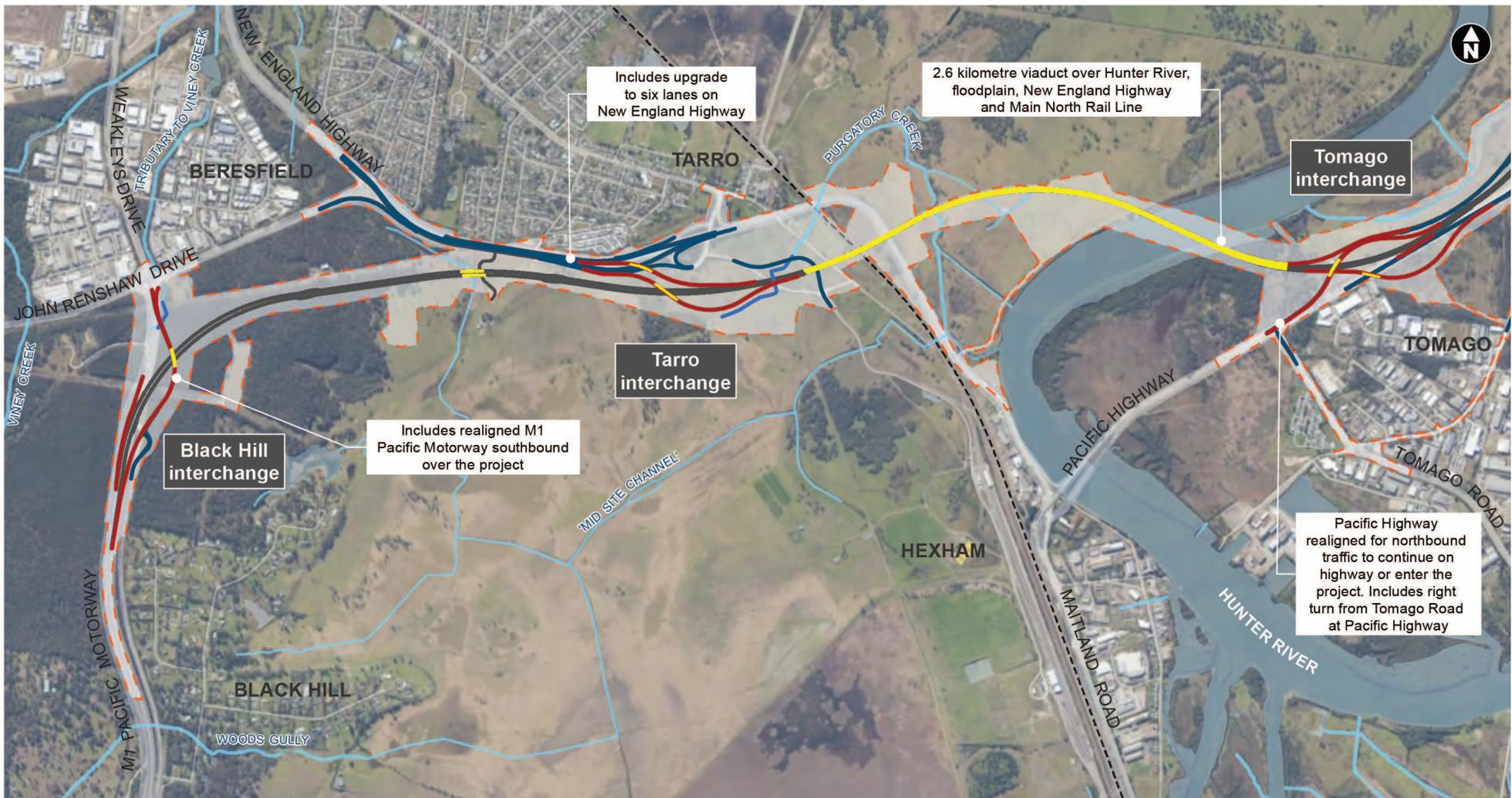
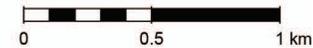


Figure 1-1 Regional context of the project

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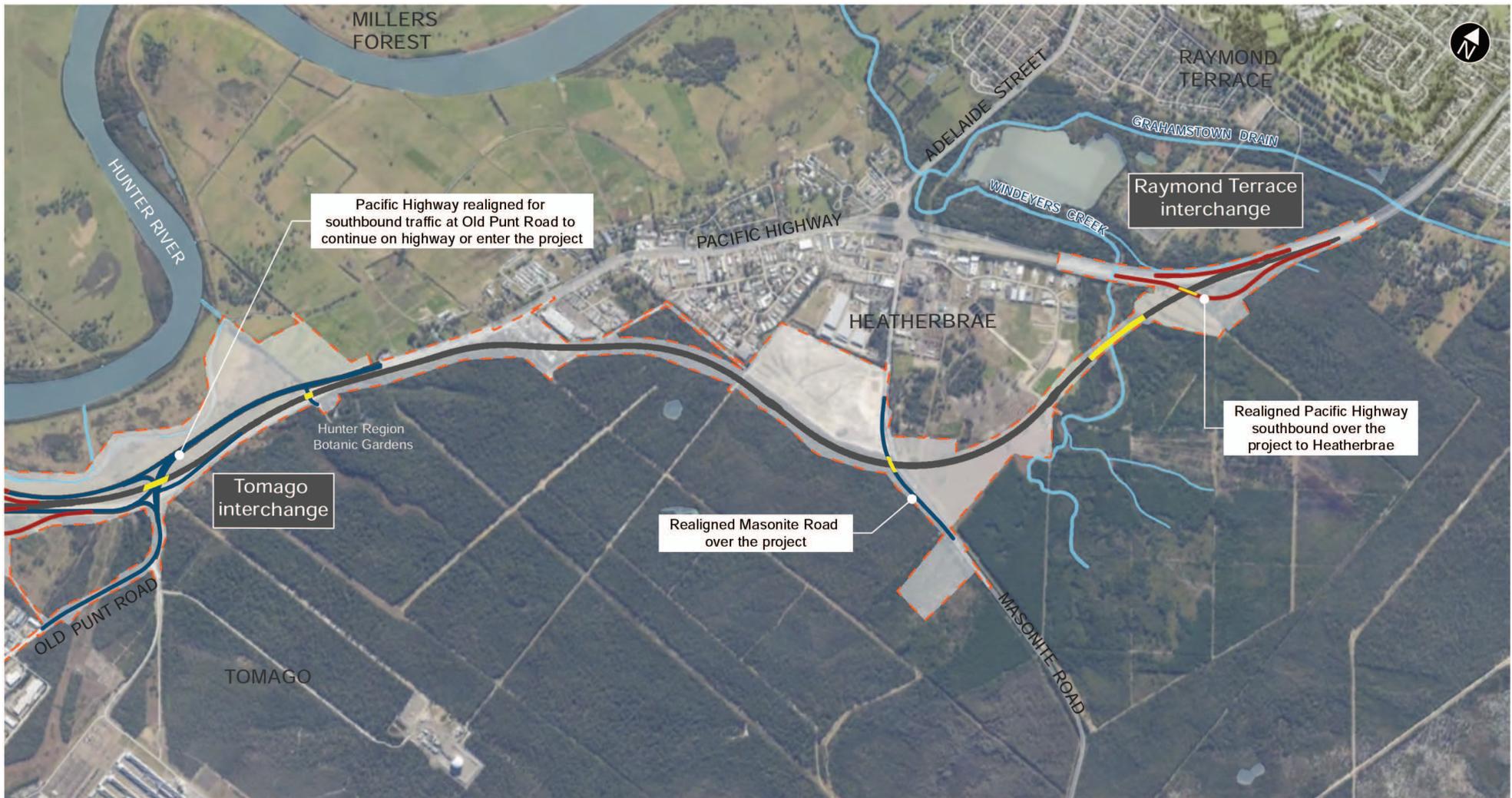
- Main alignment
- Adjustments to existing roads
- New ramp
- Creek realignment
- Bridges/ Viaduct
- Construction footprint
- Waterways
- Main North Rail Line



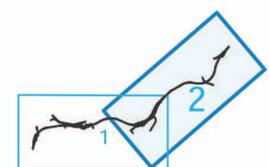
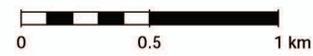
Page 1 of 2

Figure 1-2 Project key features (map 1 of 2)

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- Main alignment
- Adjustments to existing roads
- New ramp
- Bridges/ Viaduct
- - - Construction footprint
- Waterways



Page 2 of 2

Figure 1-2 Project key features (map 2 of 2)

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1.3 Performance outcomes

The desired performance outcomes for the project relating to key Secretary’s Environmental Assessment Requirement (SEAR) 12 Socio-economic, land use and property are:

- The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities (refer to the Socio-economic Working Paper (Appendix M of the EIS))
- The project minimises impacts to property and businesses and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure (refer to **Section 5.1**)
- Effective engagement is undertaken with stakeholders during project design and delivery (refer to the Socio-economic Working Paper (Appendix M of the EIS)).

This assessment addresses those outcomes relating to land use and property. Further information to address outcomes relating to socio-economic values is provided in the Socio-economic Working Paper (Appendix M of the EIS).

1.4 Secretary’s Environmental Assessment Requirements

This assessment forms part of the EIS for the project. The EIS has been prepared under Division 5.2 of the EP&A Act. This assessment has been prepared to address the SEARs (SSI 7319) relating to land use and property and will assist the Minister for Planning and Public Spaces to make a determination on whether or not to approve the project. It provides an assessment of potential impacts of the project on land use and property and outlines proposed management measures.

In 2019 revised SEARs were issued for the project, which included socio-economic, land use and planning as a key issue. **Table 1-1** outlines the SEARs relevant to this assessment along with a reference to where these are addressed.

Table 1-1 SEARs relevant to land use and property

| Secretary’s requirement | Where addressed in this report |
|--|--|
| 12. Socio-economic, land use and property | |
| 1. The proponent must assess social and economic impacts in accordance with the current guidelines (including cumulative ongoing impacts of the project. | Refer to the Socio-economic Working Paper (Appendix M of the EIS) |
| 2. The proponent must assess impacts from construction and operation on potentially affected properties, businesses, Crown land, Council assets and services, recreational users, and land and water users (including recreational and commercial fishers, and oyster and aquaculture farmers), including property acquisitions/ adjustments, access, amenity and relevant statutory rights. | <p>Section 5.1 for property impacts (including acquisitions / adjustments for private property, commercial land uses, council land, Crown land and utilities)</p> <p>Section 5.1.2 for Crown land impacts</p> <p>Section 5.2 for impacts on existing land uses</p> <p>Section 5.2.4 for impacts on water resources</p> <p>Section 5.6 for impacts to water users</p> <p>Section 5.1.2 and Section 5.2.4 for impacts to property access and access to the Hunter River</p> <p>Section 5.1.2 for property acquisition process</p> <p>Refer to the Socio-economic Working Paper (Appendix M of the EIS) for other potential impacts associated with amenity, access, businesses, Council assets and services and recreational users (including recreational and commercial fishers, and oyster and aquaculture farmers)</p> |

| Secretary's requirement | Where addressed in this report |
|--|--|
| <p>3. The proponent must assess impacts on:</p> <ul style="list-style-type: none"> a) any operating mines, extractive industries or known mineral or petroleum resources b) exploration activities in the vicinity of the project c) access for future exploration areas. | <p>Section 5.4</p> |
| <p>4. The design, construction and operation of the project should address and minimise (existing and future) land use conflicts and operations (including existing and ongoing agricultural activities). Siting of project elements should be located in a way that functional, contiguous areas of residual land and land uses are maximised.</p> | <p>Section 5.2 for existing land use Section 5.7 for future land use Section 5.2 for operations (including existing and ongoing agricultural activities) Section 5.1.1 for siting of project elements</p> |
| <p>5. The Proponent must undertake an assessment of biosecurity risks and management measures relating to the potential for spread of pests, disease or weeds, in accordance with the 'general biosecurity duty' under the <i>Biosecurity Act 2015</i>.</p> | <p>Section 5.2.1 Further information on potential for spread of pests, disease or weeds, and the 'general biosecurity duty' is provided in the Biodiversity Assessment Report (Appendix I of the EIS)</p> |
| <p>6. The Proponent must assess potential impacts on utilities (including communications, electricity, gas, and water and sewerage) and the relocation of these utilities.</p> | <p>Section 5.5</p> |
| <p>7. A draft Community Consultation Framework must be prepared identifying relevant stakeholders, procedures for distributing information and receiving/responding to feedback and procedures for resolving stakeholder and community complaints during the design, construction and operation of the project. Key issues that must be addressed in the Framework include, but are not limited to:</p> <ul style="list-style-type: none"> a) traffic management (including property, cyclists and pedestrian access) b) landscaping/ urban design matters c) hydrology and flooding d) staging and timing of construction activities including out of hours work and utility relocations e) noise and vibration mitigation and management f) soil erosion and water quality management g) interaction with existing land uses. | <p>A draft Community Consultation Framework is provided in Appendix E of the EIS. Additional details on community consultation are provided in Chapter 6 of the EIS.</p> |

| Secretary's requirement | Where addressed in this report |
|---|--|
| 17. Safety and risk | |
| 2. The proponent must assess the biosecurity risk of the project to minimise the inadvertent spread of disease and pathogens affecting agricultural activities, native vegetation and threatened fauna. | <p>Section 5.2.1 and Section 5.2.4.</p> <p>Further information on potential for spread of pests, disease or weeds, and the 'general biosecurity duty' is provided in the Biodiversity Assessment Report (Appendix I of the EIS) and Chapter 22 of the EIS (safety and risk).</p> |

1.5 Report structure

The report is structured as follows:

- Chapter 1 – Introduces the project with a summary of the project background, project description, performance outcomes and SEARs
- Chapter 2 – Provides an overview of the policy and planning setting
- Chapter 3 – Provides a summary of the assessment methodology used to inform the assessment
- Chapter 4 – Details the existing environment
- Chapter 5 – Provides an assessment of potential impacts
- Chapter 6 – Details the potential cumulative impacts
- Chapter 7 – Details the proposed management measures for the project
- Chapter 8 – Conclusions
- References
- Terms and acronyms.

2. Policy and planning setting

2.1 New South Wales

2.1.1 Hunter Regional Plan 2036

The Hunter Regional Plan 2036 (the Regional Plan) (DPE, 2016) is a 20-year vision for the future of the Hunter, developed in consultation with Councils, stakeholders and the wider community. It provides an overarching framework to guide the NSW Government's land use planning priorities and decisions over the next 20 years, including more detailed land use plans, development proposals and infrastructure funding decisions.

The vision for the Hunter Region is for it to be the "...leading regional economy in Australia with a vibrant new metropolitan city at its heart". The vision recognises Greater Newcastle as the centrepiece of the region, while beyond Greater Newcastle there are vibrant centres, towns and villages, connected with faster inter-regional transport and digital technology, making it easier for residents and businesses to interact and do business. To achieve the vision for the Hunter Region, the Regional Plan outlines four regionally focused goals, including:

- The leading regional economy in Australia
- A biodiversity-rich natural environment
- Thriving communities
- Greater housing choice and jobs.

Figure 2-1 shows the strategic plan for the Greater Newcastle area. The Regional Plan identifies that by 2036, the Hunter Region will support up to 862,250 people and an additional 61,500 jobs. Raymond Terrace is identified as a strategic centre, which will be the focus of population and/or employment growth over the next 20 years, with Tomago and Heatherbrae also identified as significant employment land clusters. The convergence of the national road network around Thornton, Beresfield and Black Hill is also identified as a significant employment precinct. Priorities identified for Raymond Terrace relate to supporting its role as the main service centre in the local government area (LGA) and investigating increasing social, transport and economic connections to surrounding communities and centres across the Greater Newcastle area.

Infrastructure investment is considered the linchpin of economic development across the Hunter, supporting freight, health and education services, and agribusiness and tourism. Direction 4 – enhance interregional linkages to support economic growth – identifies the need for improvements to transport corridors to maintain efficiencies in the network, particularly for freight, and to allow for future growth. The project is identified in the Regional Plan and would support the achievement of this direction.

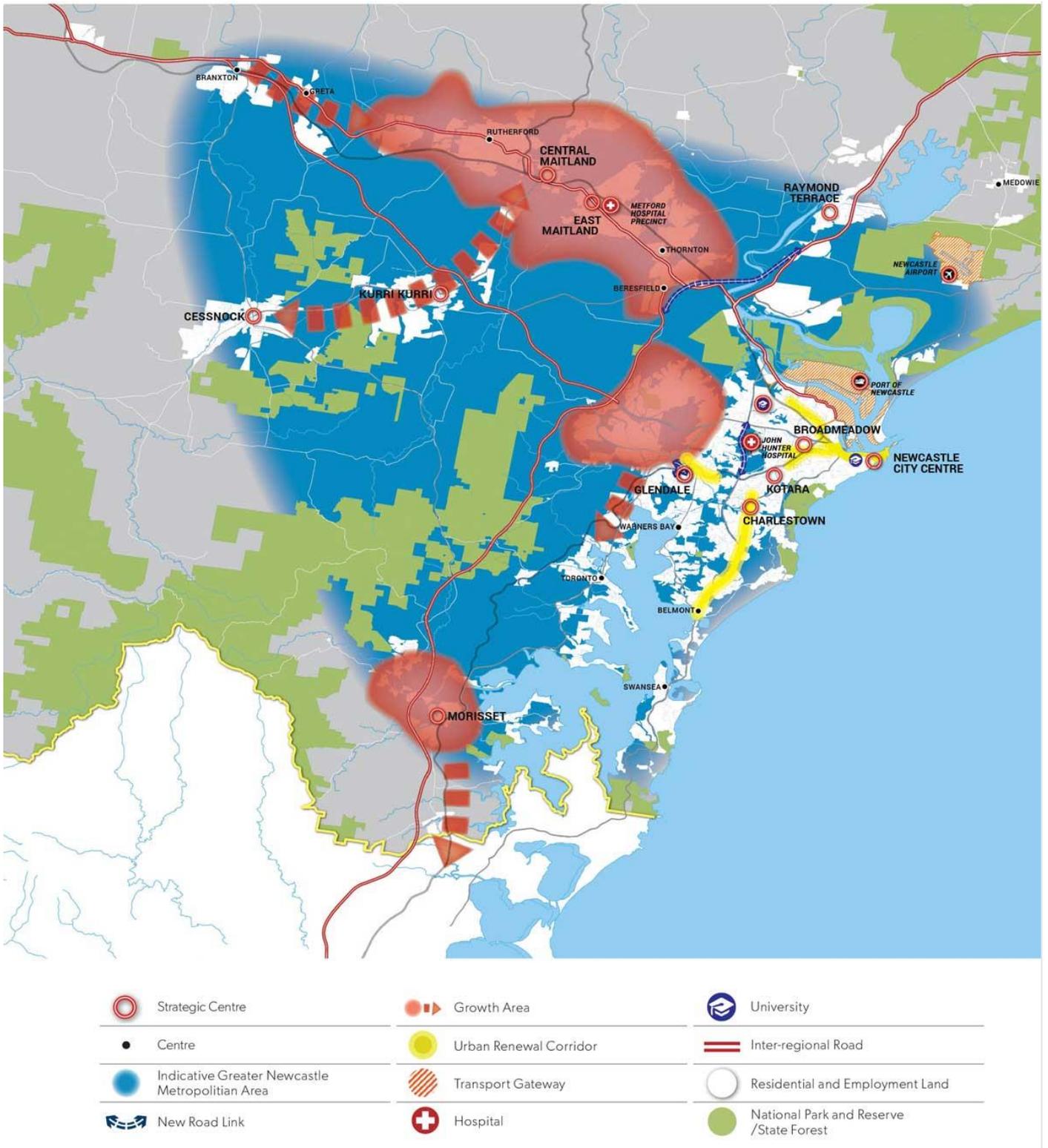


Figure 2-1 Hunter Regional Plan 2036 – Greater Newcastle

Source: DPE, 2016

2.1.2 Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 (Metropolitan Plan) (DPE, 2018) sets out strategies and actions that will drive sustainable growth across the Greater Newcastle area. The plan aligns with the vision and goals of the Hunter Regional Plan 2036 and guides local planning across the Greater Newcastle LGAs of Cessnock City, Lake Macquarie City, Maitland Council, City of Newcastle and Port Stephens Council.

The vision for Greater Newcastle is to be *‘Australia’s newest and emerging economic and lifestyle city, connected with northern NSW and acknowledged globally as:*

- *dynamic and entrepreneurial, with a globally competitive economy and the excitement of the inner city and green suburban communities*
- *offering great lifestyles minutes from beaches or bushland, the airport or universities, and from the port to the lake*
- *a national leader in the new economy, with smarter cities and carbon neutral initiatives, and with collaborative governance that makes it a model to others in creating and adapting to change.”*

The vision for Greater Newcastle is presented in **Figure 2-2**. The Metropolitan Plan recognises Raymond Terrace as an emerging city centre and location for local housing and jobs opportunities, and Beresfield – Black Hill and Tomago as major employment and trading hubs. The Metropolitan Plan recognises that opportunities exist to better connect trade movements across NSW and nationally via major road networks, including the Pacific Highway, and the national rail network. Large sites around these trading hubs are dedicated for freight and logistics, capturing the opportunity from improved connectivity. Improving connections to jobs, services and recreation is identified as a key outcome for the Metropolitan Plan.

Tomago and Beresfield – Black Hill are identified as two of the 11 ‘catalyst areas’ within Greater Newcastle. The catalyst areas will underpin new job opportunities for Greater Newcastle. Beresfield – Black Hill is projected to provide an additional 800 jobs by 2036 for a total of 6050 jobs, while Tomago is projected to provide an additional 700 jobs, with a total of 8500 jobs. This Metropolitan Plan recognises that good access to transport services is critical for new employment and housing opportunities to be realised within these catalyst areas.

The project would support the vision and outcomes for Greater Newcastle by providing improved access and connectivity to key employment precincts and strategic centres, allowing the safe, efficient and reliable movement of people and freight.



Figure 2-2 Greater Newcastle Metropolitan Plan 2036
 Source: DPE, 2018

2.1.3 State Environmental Planning Policy (Infrastructure) 2007

The State Environmental Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP) facilitates the effective delivery of infrastructure across NSW. Clause 94 of the Infrastructure SEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. The project is therefore permissible without development consent.

2.2 Local government

2.2.1 Local Environmental Plans

Local Environmental Plans (LEPs) guide planning decisions for the LGAs through zoning and development controls. The LEPs provide a framework for the way that land in the LGA can be used and are the main legislative tool to shape the future of communities and ensuring that development is done appropriately. The project is covered by the following LEPs:

- Port Stephens Council Local Environmental Plan 2013 (Port Stephens LEP)
- City of Newcastle Local Environmental Plan 2012 (Newcastle LEP).

The Newcastle LEP and Port Stephens LEP contain a road corridor reserved for the project. The development of the concept design has resulted in some parts of the project being located outside the reserved corridor (refer to **Section 4.4**). Project development and consideration of alternatives to the project is discussed further in Chapter 4 of the EIS.

The application of the Infrastructure SEPP means the project is not subject to the requirements of LEPs, although for completeness, consideration has been given in this assessment to the zoning requirements of the LEPs.

2.2.2 Port Stephens Council

Port Stephens Strategic Planning Statement

The Port Stephens Local Strategic Planning Statement (LSPS) (PSC, undated) identifies the 20-year vision for land use in the Port Stephens Council LGA. It sets out the planning priorities for the future and identifies short, medium and long-term actions to deliver these priorities. The LSPS gives local-level effect to State government regional plans and provides the link between the Port Stephens' Community Strategic Plan 2018-2028 (PSC, 2018) and land use planning. The LSPS identifies the land use planning actions to achieve the directions in the Hunter Regional Plan 2036, Greater Newcastle Metropolitan Plan 2036 and the Port Stephens Community Strategic Plan.

The LSPS recognises the contribution of Port Stephens to the Hunter region and the LGA's strategic location for economic growth, with a regionally significant tourist and visitor economy, a long-established manufacturing sector, and growing aviation and defence hub. Proximity to the M1 Motorway is recognised as one of the factors that makes Port Stephens a convenient choice for business and creates opportunities for growth.

Tomago and Heatherbrae are identified as major employment areas, which are complemented by strategic centres such as Raymond Terrace. Tomago is identified as a 'Catalyst Area' for the Greater Newcastle Metropolitan area. Tomago supports internationally recognised and highly specialised manufacturing businesses and is expected to provide for a minimum of 700 additional jobs by 2036. The strengthening of Heatherbrae's role as a key destination for bulky goods commercial development is identified as an action for Planning Priority 2 – making business growth easier.

Enhanced inter-regional connections is a key priority for Port Stephens Council. Planning Priority 12 recognises proximity to transport connections, including the M1 Motorway, supports local business and industry to access markets in Sydney, the Hunter Valley, northern and central NSW and interstate. The LSPS indicates that Council will advocate for improved transport connections, including more active and public transport, from centres such as Raymond Terrace to major employment areas at Tomago, Williamstown and other centres in Greater Newcastle.

Raymond Terrace and Heatherbrae Strategy 2015-2031

The Raymond Terrace and Heatherbrae Strategy 2015-2031 (the Raymond Terrace and Heatherbrae Strategy) (PSC, 2015) provides a series of goals and actions for Raymond Terrace. Port Stephens Council's vision for Raymond Terrace is for it to be a 'strong regional centre and a great place to live, work and play'.

Goals which are relevant to the project include:

- Goal 1: A competitive economy with regional services, including transport, health, justice, government, commercial, retail, industrial and entertainment, which looks at:
 - Growing a more regionally competitive centre by providing lands to strengthen the retail offering of Raymond Terrace and facilitating Heatherbrae as a destination for bulky goods
 - Enhancing transport and mode connectivity, including road, public transport, footpath and cycleway connections within Raymond Terrace and Heatherbrae
 - Planning for regional soft infrastructure services to meet the needs of a growing community
 - Raising the profile of Raymond Terrace through a commercial strategy / prospectus.

The Raymond Terrace and Heatherbrae Strategy identifies that the project 'places Heatherbrae in a position to evolve from a destination that caters to passing traffic to become a destination in itself, catering for the needs of the growing residential population'. In addition, the strategy acknowledges the need to prepare Heatherbrae for the project, including 'effective connections to improve connectivity and safety, while providing opportunities for Heatherbrae to evolve from a highway service centre'. The project would relieve congestion within the existing road network at Heatherbrae while maintaining connections for public transport, pedestrians and cyclists.

2.2.3 City of Newcastle

City of Newcastle Local Strategic Planning Statement

The City of Newcastle Local Strategic Planning Statement (LSPS) (CoN, undated) is the City of Newcastle's plan to guide land use planning over the next 20 years. It sets out the planning priorities to achieve the land use planning vision and will inform decisions on changes to the planning rules.

The LSPS implements priorities from the Community Strategic Plan, Newcastle 2030 (CoN, undated) and brings together land use planning strategies for other City of Newcastle strategies. It also gives effect to the Hunter Regional Plan 2036 (DPE, 2016) and Greater Newcastle Metropolitan Plan 2036 (DPE, 2018).

The LSPS will implement changes to the existing industrial zones at Beresfield and Black Hill to realise the vision identified in the Greater Newcastle Metropolitan Plan 2036 for the Beresfield – Black Hill Catalyst Area to be a leading freight and logistics hub.

Planning Priority 3 of the LSPS recognises the importance of the movement of freight for the economic prosperity and employment opportunities of NSW and the need to protect freight movement from incompatible land uses. Planning Priority 8 also recognises the need to plan for growth and change in growth and development areas, including Catalyst Areas, including the need to plan and prioritise infrastructure delivery with future development. The project would support these planning priorities by enhancing access and connectivity to support the development of the Beresfield – Black Hill Catalyst Area and through its location generally away from incompatible land uses, minimising potential amenity impacts on sensitive land uses.

2.3 Guidelines

2.3.1 Land Use Conflict Risk Assessment Guide

The Land Use Conflict Risk Assessment (LUCRA) Guide (DPI, 2011) provides guidance on measures for conducting a LUCRA to avoid and manage land use conflicts. The guide includes a methodology for assessing the potential for land use conflict to occur between neighbouring land uses. The assessment provides a ranking of risk associated with a potential source of conflict based on a risk ranking matrix to inform the identification of risk reduction strategies. The LUCRA risk ranking matrix has been considered in assessing potential impacts on rural land uses.

2.3.2 Infrastructure Proposals on Rural Land

The Infrastructure Proposals on Rural Land (DPI, 2013a) provides guidance to help consent authorities maintain sustainable primary production and development opportunities and minimise land use conflict when assessing infrastructure proposals affecting rural land. The guidance does not address classified road and road traffic facilities, although this assessment considers the matters raised in this guideline.

The guidelines identify a range of impacts from infrastructure projects that are of particular significance for sustainable agriculture, including:

- Resource loss and fragmentation
- Impacts on farming operations and livestock
- Increased weed, biosecurity and bushfire risks
- Site rehabilitation (DPI, 2013a).

2.3.3 Development adjacent to National Parks and Wildlife Service lands

The guidelines for *Development adjacent to National Parks and Wildlife Service lands* (DPIE, 2020) apply to development applications and proposals that may impact on areas managed by National Parks and Wildlife Service (NPWS), such as national parks, nature reserves and other types of conservation lands. The guidelines update the previous Office of Environment and Heritage Guidelines for developments adjacent to national parks (2013).

The guidelines provide guidance to consent and planning authorities in their assessment of development applications that are adjacent to land managed by NPWS. Key issues for consideration include:

- Erosion and sediment control
- Stormwater runoff
- Wastewater
- Pests, weeds and edge effects
- Fire and the location of asset protection zones
- Boundary encroachments and access through NPWS land
- Visual, odour, noise, vibration, air quality and amenity impacts
- Threats to ecological connectivity and groundwater dependent ecosystems
- Cultural heritage
- Access to parks.

The project is removed from areas of land managed by NPWS and is not expected to result in any land use or property impacts on land managed by NPWS, for example in relation to pests, weeds and edge effects, encroachment, amenity or access. The guideline were considered in relation to indirect water quality impacts on the Hunter Wetlands National Park. Further discussion is provided in the Biodiversity Assessment Report (Appendix I of the EIS).

2.3.4 Revocation, re-categorisation and road adjustment policy

The Revocation, recategorization and road adjustment policy (DPIE, 2018) applies to lands acquired or reserved under the *National Parks and Wildlife Act 1974* (NPW Act). The policy aims to:

- Ensure that proposals to revoke land, change a reserve category, or adjust road boundaries in a reserve are consistent with legislation and policy
- Ensure that the combined effect of a revocation and any compensation results in a good outcome having regard to all the conservation, cultural-heritage and other values of the relevant protected lands
- Guide staff in how to apply section 188C of the NPW Act
- Ensure that cumulative use of section 188C does not significantly erode the area and value of land reserved under the NPW Act
- Achieve the best conservation outcome (<https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/park-policies/revocation-recategorisation-and-road-adjustment>).

The project would not require the revocation or re-categorisation of land reserved under the NPW Act or the adjustment of any roads adjoining land reserved under the NPW Act.

2.3.5 TransGrid Easement Guidelines for Third Party development

The TransGrid Easement Guidelines for Third Party development (TransGrid, undated) outlines requirements relating proposed activities within an easement area. Roads are identified as an activity that may be approved with conditions, subject to TransGrid's prior written consent. Specifically, the guidelines state that:

Roads, subject to horizontal and vertical clearances. Restrictions and other conditions on consent may also apply.

Note: Roads located within 20 metres of any part of a transmission line structure will not be approved.

Where it is proposed that a road passes within 30 metres of a transmission structure or supporting guy, TransGrid may refuse consent or impose restrictions and other conditions on consent. Where a road passes within 30 metres of a transmission structure or supporting guy, the structure's earthing system may require modification for reasons including, but not limited to, preventing fault currents from entering utility services which may be buried in the road. The option of raising conductors or relocation of structures, at the full cost of the proponent, may be considered.

The guidelines have been considered in the design through consultation with TransGrid.

3. Assessment methodology

3.1 Methodology

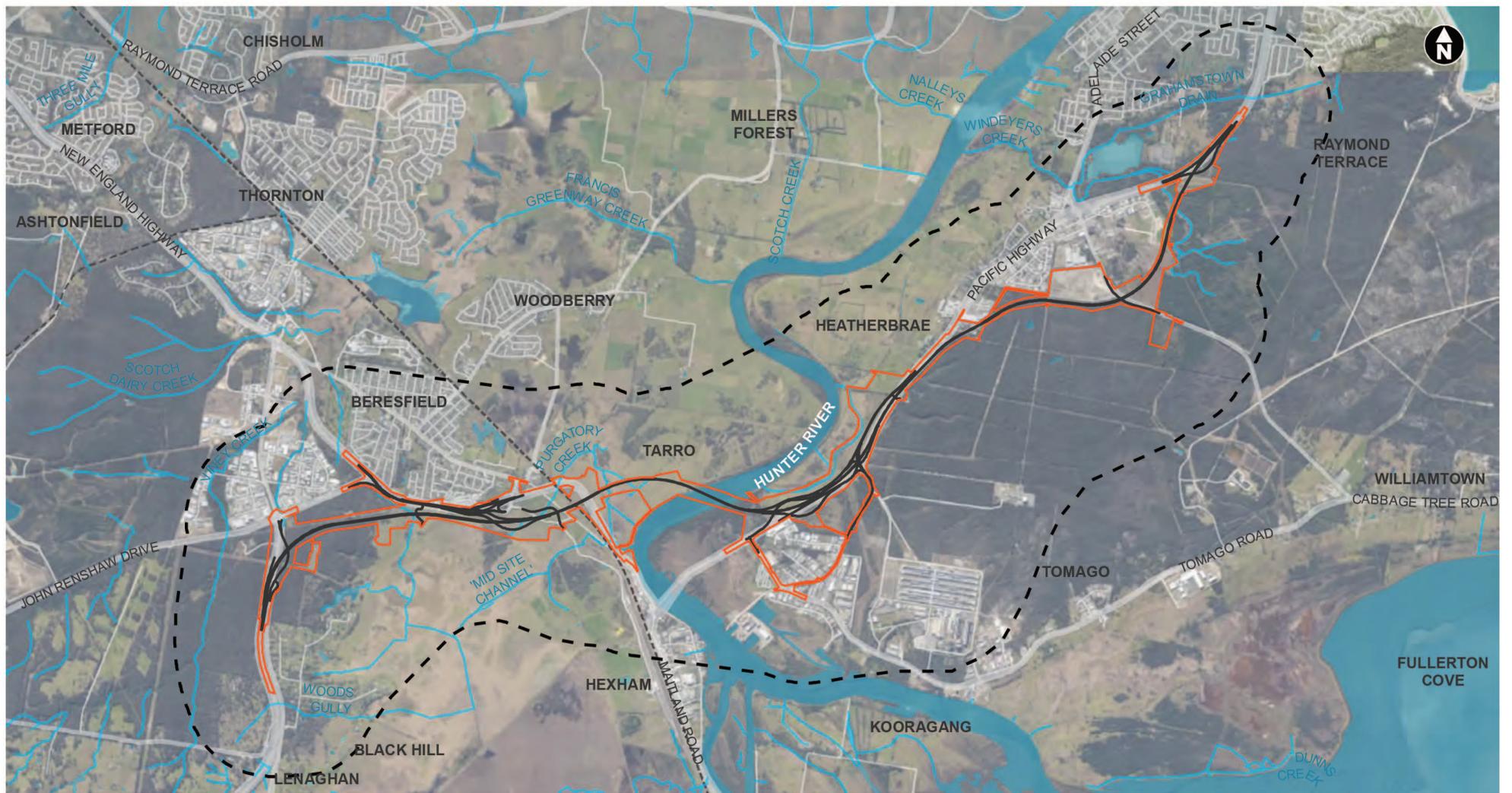
The methodology for the land use and property assessment involved:

- Review of existing information relevant to land use and property within the study area, including:
 - Existing NSW Government and local government strategic planning policies, strategies and guidelines relevant to the study area (refer to **Chapter 2**)
 - Spatial information and aerial photography to identify existing land uses and tenure (refer to **Section 3.1.2**)
 - Outcomes of community and stakeholder consultation carried out for the project, including with property owners, local community and key stakeholders (refer to **Section 5.1**).
- Describing existing land use and property characteristics in the study area, including (**Chapter 4**):
 - Property and tenure, based on NSW Government property data
 - Existing land uses in the study area based on the review of NSW Government state-wide land use mapping and aerial photography
 - Future land use and development areas as described by relevant State and local government planning strategies.
- Assessing potential land use and property impacts during construction and operation (refer to **Chapter 5**), including:
 - Impacts associated with the property acquisition and temporary lease of land during construction, and impacts on property access and amenity
 - Impacts for existing and future land uses, including conservation and natural environments, primary production uses, mining and exploration activities, utilities and water resources.
- Evaluating the potential risk for land use conflicts between the project and adjoining rural land uses based on the risk matrix presented in the Land Use Conflict Risk Assessment Guide (DPI, 2011) (refer to **Section 5.8** and **Appendix C**)
- Describing potential cumulative land use and property impacts that may arise from the interaction of construction and operation of the project, and other approved or proposed projects in the area (refer to **Chapter 6**)
- Identifying measures to avoid, minimise or mitigate land use and property impacts arising from the project's construction and operation (refer to **Chapter 7**).

3.1.1 Study area

The study area for the land use and property assessment is shown in **Figure 3-1** and includes the project's construction footprint and a buffer of at least one kilometre around the construction footprint. This area was selected to capture key land uses at Beresfield, Tomago and Heatherbrae (for example, residential uses at Beresfield and Tarro, and industrial uses at Beresfield and Tomago).

This assessment considers potential land use and property impacts based on the construction and operational footprints for the project as shown in **Figure 3-2**. The project is located within the City of Newcastle and Port Stephens Council LGAs. This assessment also considers potential impacts on regional land use and development within these LGAs. Chapter 5 of the EIS provides a detailed description of the project including operation and general construction and ancillary facility activities.



- Study area
- Construction footprint
- The project
- Main North Rail Line
- Waterways

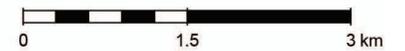


Figure 3-1 Study area

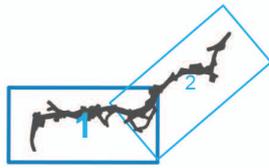
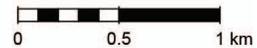
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- Construction footprint
- Operational footprint
- The project

----- Main North Rail Line

— Waterways

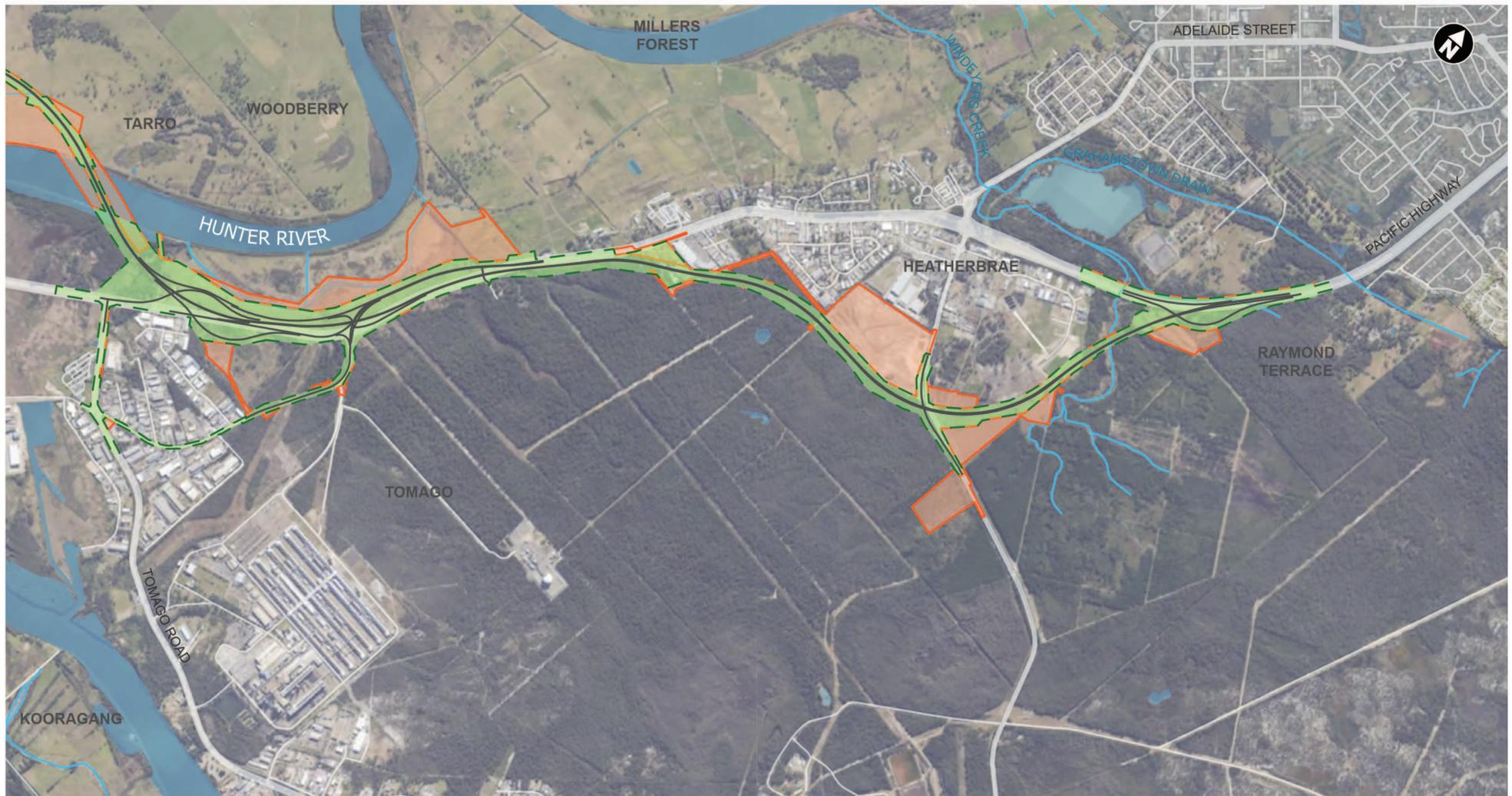


Page 1 of 2



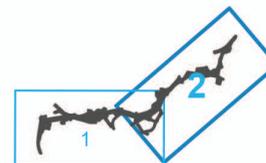
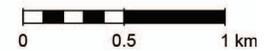
Figure 3-2 Construction and operational footprints (map 1 of 2)

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- Construction footprint
- Operational footprint
- The project

Waterways



Page 2 of 2



Figure 3-2 Construction and operational footprints (map 2 of 2)

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3.1.2 Data sources

Data sources reviewed and presented in this assessment include:

- NSW Government and local government strategic planning documents and websites including regional planning strategies and LEPs for the City of Newcastle and Port Stephens Council
- Spatial information and data from the NSW government relating to existing land uses, based on the state-wide NSW Landuse 2017 dataset (v1.2), land use zoning, utilities and property including land tenure
- Data from the Bureau of Meteorology, Australian Groundwater Explorer, WaterNSW groundwater database and WaterNSW water register were used to identify groundwater work and water licences
- Data from the NSW Department of Planning, Industry and Environment (DPIE) MinView database for mining, extractive industries and exploration activities.

4. Existing environment

4.1 Regional land use context

The project is located within the City of Newcastle and Port Stephens Council LGAs in the Hunter region.

The Hunter is the largest regional economy in Australia in terms of economic output and drives around 28 per cent of regional NSW's total economic output. The Hunter is also the largest regional contributor to the State's gross domestic product (DPE, 2016). Greater Newcastle is Australia's seventh largest city and global gateway for northern NSW. The Greater Newcastle area has a strong mining and industrial heritage, which is transitioning to a service, create and knowledge city and a new future with investment in aviation, transport, education, health and tourism (DPE, 2018).

Key regional land uses within the Hunter include:

- Manufacturing and industrial uses, including at Beresfield, Black Hill, Tomago and Heatherbrae, Cardiff, Port of Newcastle and surrounding port lands, and at Kooragang Island located downstream of the project
- Agricultural and rural uses, including wine making, thoroughbred horse breeding and major beef cattle production
- Environmental uses, including the Hunter Wetlands National Park, Hunter River, and Hunter Region Botanic Gardens at Heatherbrae
- Tourism, associated with agricultural activities and wine growing
- Defence services, with defence establishments at the Royal Australian Air Force Base in Williamstown, Lone Pine Barracks in the Singleton Military Area and Myambat Logistics Company near Denman
- Newcastle Airport at Williamstown, which is a key global gateway to the Hunter and focus for technology, defence and aerospace industries
- Major health care and education services, including within Newcastle and Maitland
- Mining and power generation within the Upper Hunter.

The M1 Pacific Motorway is a key north-south corridor linking Sydney to the Central Coast, Newcastle and Hunter region. As described in Chapter 3 of the EIS, the New England Highway and the Pacific Highway between the M1 Pacific Motorway at Black Hill and Raymond Terrace form part of the National Land Transport Network. The current alignment between the M1 Pacific Motorway at John Renshaw Drive and the Raymond Terrace Bypass is a congestion point on the National Land Transport Network.

The New England Highway and the Pacific Highway facilitate significant interstate freight movements between NSW, Victoria and Queensland. These roads also facilitate significant freight movements between Sydney, the Hunter region and northern NSW. The project is one of the remaining upgrades required to complete a high-quality route between Melbourne, Sydney and Brisbane.

The Socio-economic Working Paper (Appendix M of the EIS) provides further detail on key regional industries in the Hunter.

4.2 Property

Property within the study area comprises privately owned property, land owned by the City of Newcastle and Port Stephens Council, and State-owned land. Transport has been progressively acquiring land for the project, with about 43 per cent of property affected by the construction footprints (about 152.6 hectares) owned by Transport, including land within the existing railway corridor and properties acquired for the project.

Land tenure in the study area is shown in **Figure 4-1** and mainly comprises freehold land. This includes land previously purchased by Transport for the project. Other land tenure in the study area includes:

- Crown land within the construction and operational footprints on either side of the Hunter River, and at Tomago and Heatherbrae
- Local government land at Beresfield next to the construction and operational footprints next to the New England Highway
- Commonwealth owned land within the study area comprises residential uses at Raymond Terrace owned by Defence Housing Australia, and the Australia Post delivery centre at Heatherbrae. These Commonwealth owned properties would not be affected by the project.

Further information about land ownership and property requirements for the project's construction and operation is provided in **Section 5.1**.

4.3 Existing land uses

Land within the study area is used for a range of urban, rural and environmental uses. Key land uses in the study area are shown on **Figure 4-2** and described in the following sections. Land used for grazing comprises the largest area of land within the study area, with managed resource protection and services uses the next largest land use types.

A full list of land uses in the study area and the construction and operation footprints is presented in **Appendix A**, based on the land use categories from the NSW Landuse 2017 dataset (v1.2) (DPIE, 2020).

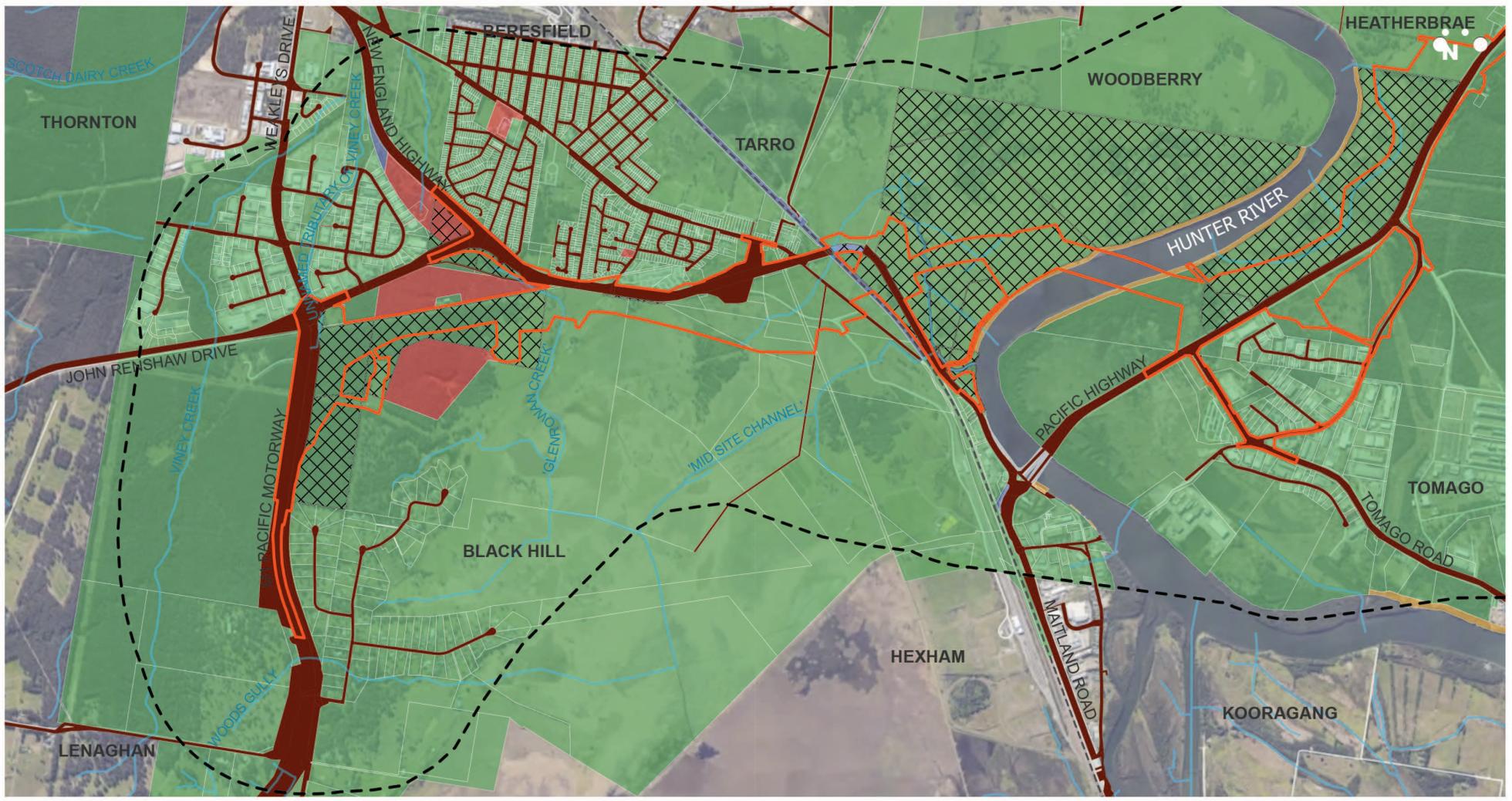
4.3.1 Primary production

Land mapped as primary production uses such as grazing, forestry, horticulture and cropping, comprises the largest area of land in the study area.

Most of the primary production land in the study area is land used for grazing at Black Hill, Tarro, Woodberry, Tomago, Heatherbrae, and Raymond Terrace.

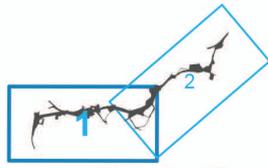
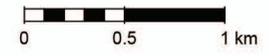
Other primary production uses in the study area including horticultural uses, plantation forests, cropping and 'land in transition' (for example, degraded land, abandoned land, and land under rehabilitation). Other primary production uses such as horticultural uses and irrigated cropping are located away from the project and would not be affected by the construction and operation footprints. Land within the study area used for plantation forests mainly comprises privately owned land at Heatherbrae. However, while mapped as plantation forests, some of the affected land has been developed for commercial and industrial uses or is identified for future industrial uses (refer to **Section 4.8**).

The study area does not include any land mapped as Biophysical Strategic Agricultural Land (DPI, 2013).



- Study area
- Construction footprint
- Land Tenure**
- Crown
- Freehold
- Local Government Authority
- NSW Government
- Project land owned by Transport
- Road reserve

Data source: LPI 2020

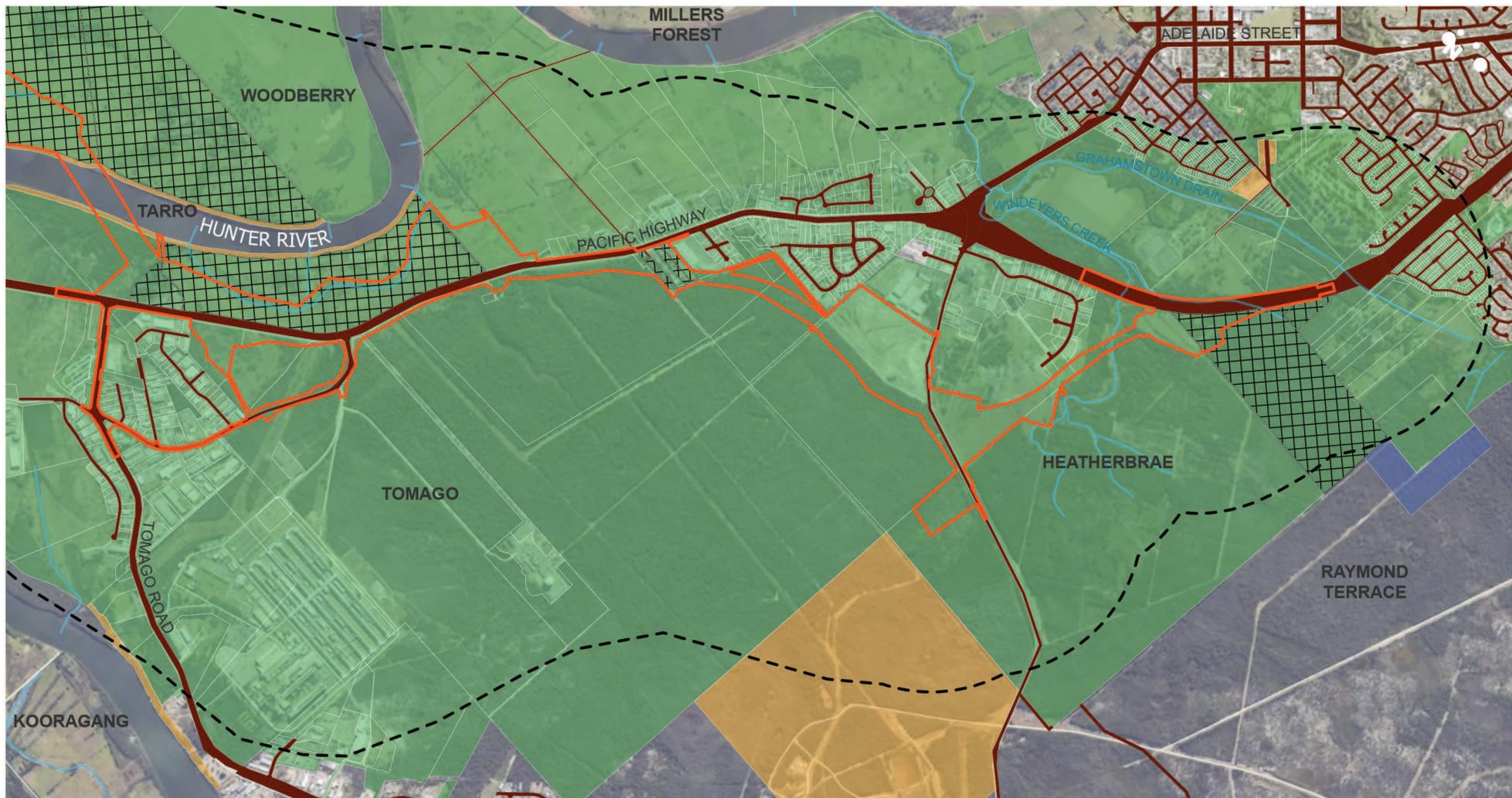


Page 1 of 2



Figure 4-1 Land tenure within the study area (map 1 of 2)

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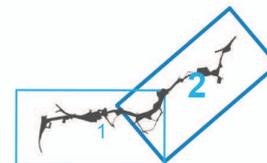
--- Study area
 Construction footprint

Land Tenure
 Crown
 Freehold
 Local Government Authority

NSW Government
 Project land owned by Transport
 Road reserve

Data source: LPI 2020

0 0.5 1 km



Page 2 of 2



Figure 4-1 Land tenure within the study area (map 2 of 2)

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4.3.2 Intensive uses

Land mapped for intensive uses mainly comprise urban uses at Beresfield, Tarro, Tomago, Heatherbrae and Raymond Terrace. Intensive uses comprise the second largest area of land in the study area, with this mainly comprising:

- Residential uses (including residential uses on farming properties and farm buildings / infrastructure), including mainly low density urban residential areas at Beresfield, Tarro, Woodberry, Heatherbrae and Raymond Terrace, and large lot rural residential uses at Black Hill, Tarro, and Heatherbrae
- Manufacturing and industrial uses at Beresfield, Hexham, Tomago, and Heatherbrae
- Commercial, recreation and cultural services, including commercial and business uses at Tomago and Heatherbrae, and community uses such as open space, sporting and education facilities at Beresfield, Tarro and Heatherbrae.

The study area also includes a range of utilities and infrastructure uses, including transport infrastructure. About 240 hectares of land in the study area is used for existing transport infrastructure, including roads and highways, local roads and rail corridors. Further information on utilities in the study area is provided in **Section 4.6**.

'Other intensive uses' in the study area comprise mining and resources uses at Black Hill and intensive animal production at Heatherbrae for horse stud farms and the agistment of horses. Further information about existing mining uses is provided in **Section 4.5**.

4.3.3 Conservation and natural environment

Land in the study area mapped for conservation and natural environment uses includes land used for nature conservation, managed resource protection (for example, surface and groundwater supplies) and other minimal uses such as residual native cover and rehabilitated land.

More than half of the land area covered by conservation and natural environment uses comprises land used for 'managed resource protection' associated with Hunter Water Corporation assets such as the Tomago Sandbeds and Grahamstown Dam in Heatherbrae (refer to **Section 4.7** for further discussion about the Tomago Sandbeds). Land identified as other minimal use comprises the next largest area of conservation and natural environment uses and includes:

- Residual native vegetation at Black Hill, which includes land identified for future industrial development within the Black Hill precinct (refer to **Section 4.8**)
- Rehabilitated land and residual native vegetation north of the Tomago Aluminium plant at Tomago.

Areas identified as nature conservation in the study area include the Hunter Wetlands National Park at Hexham.

An existing BioBank Agreement is located around the Hunter Region Botanic Gardens east of the existing highway (Lot 1 / DP748716). The BioBank site covers an area of about 106 hectares and comprises two areas, one north of the Hunter Botanical Gardens (about 44 hectares) and one to the south (about 62 hectares). Further information on the BioBank Site is in the Biodiversity Assessment Report (Appendix I of the EIS).

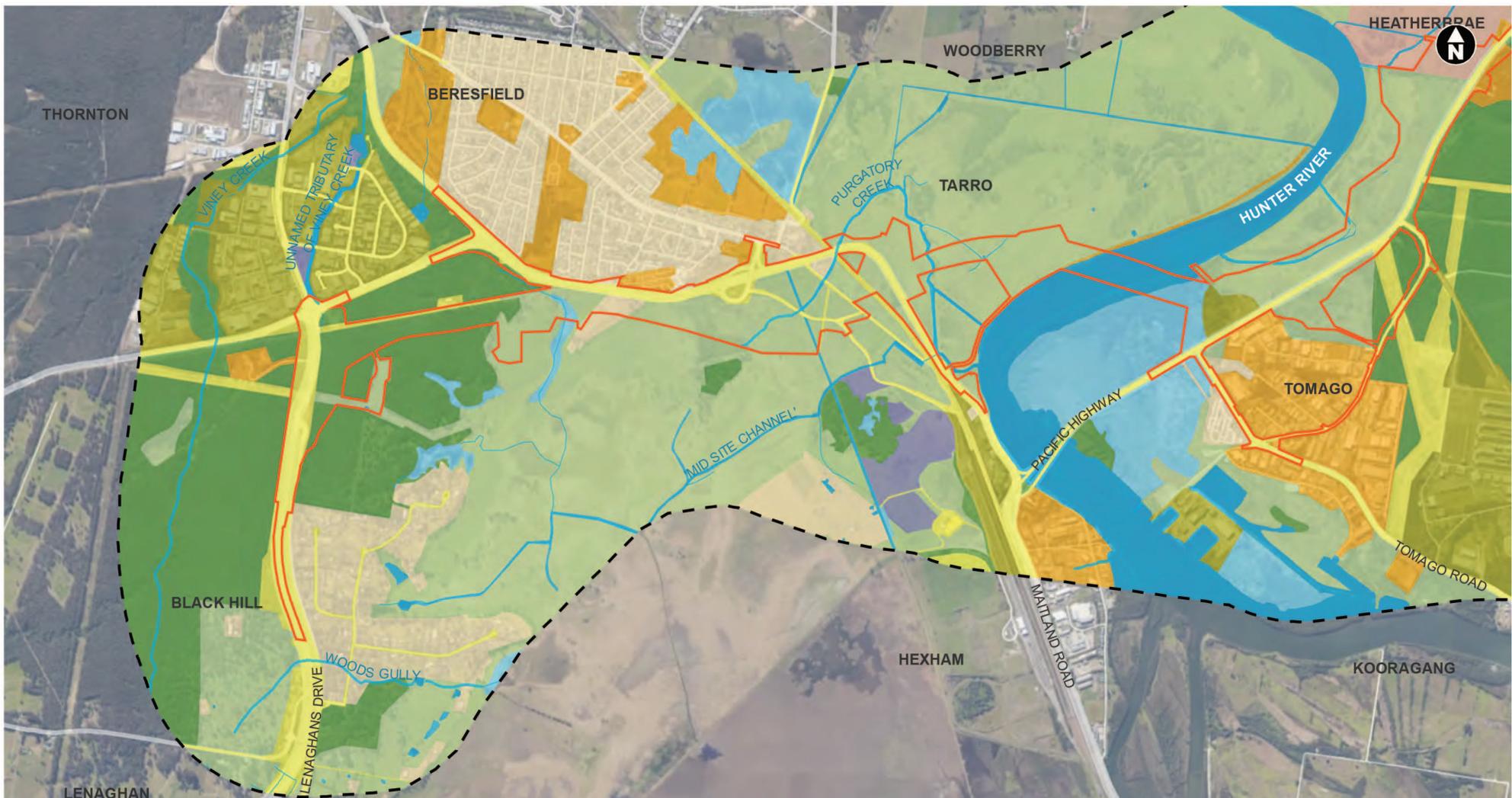
4.3.4 Water

Land mapped for water uses in the study area include:

- Water bodies such as the Hunter River, Viney Creek, Purgatory Creek and lakes, dams, drainage channels and water pipelines, including at Black Hill, Tarro, Tomago, Woodberry and Heatherbrae
- Marsh and wetland uses associated with the Hunter River floodplain at Black Hill, Lenaghan, Tarro and Tomago.

About half of the land mapped for water uses is land covered by the Hunter River.

Further information on water resources is provided in **Section 4.7**.



Study area

Construction footprint

Existing land use

Conservation and natural environments

Grazing

Other primary production uses

Manufacturing / industrial

Residential

Services

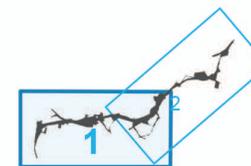
Infrastructure

Other intensive uses

Water body

Marsh / wetland

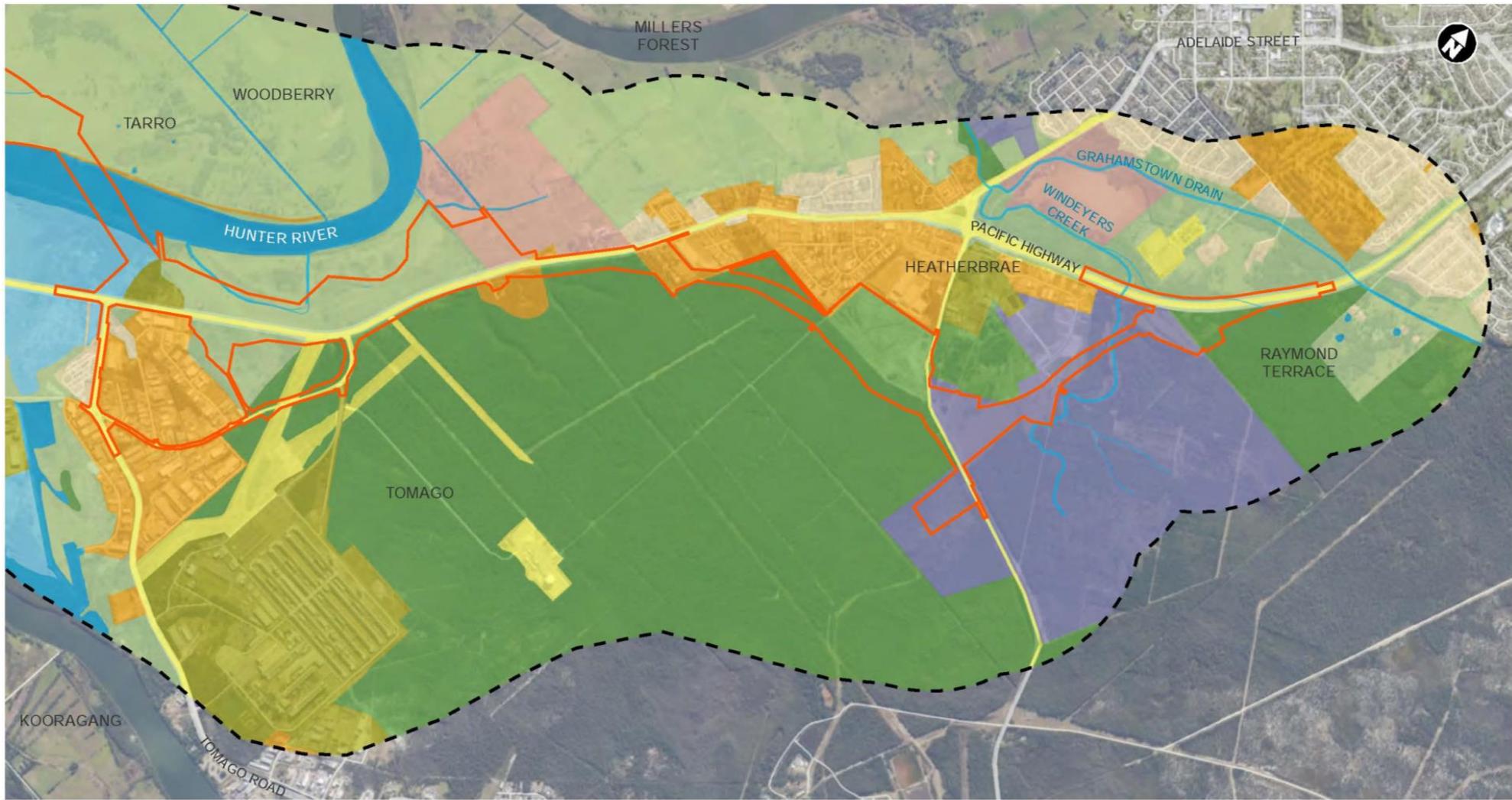
Data source: Based on DPIE 2020



Page 1 of 2

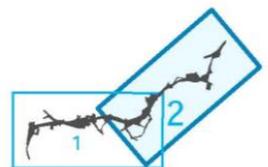
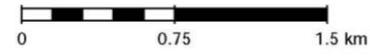


Figure 4-2 Existing land use within the study area (map 1 of 2)



- Study area
- Construction footprint
- Existing land use
 - Conservation and natural environments
 - Grazing
 - Other primary production uses
 - Manufacturing / industrial
 - Residential
 - Services
- Infrastructure
- Other intensive uses
- Water body
- Marsh / wetland

Data source: Based on DPIE 2020



Page 2 of 2

Figure 4-2 Existing land use within study area (map 2 of 2)

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4.4 Land use zoning

As indicated in **Section 2.2.1**, planning decisions within the City of Newcastle and Port Stephens Council LGAs is guided by land use zoning defined within Newcastle LEP and Port Stephens LEP.

Land use zoning in the study area is shown on **Figure 4-3**. Land within the study area is zoned for a range of uses including environmental, industrial, business, residential, recreation, primary production, rural, special activities, infrastructure and waterways. The following describes the main land use zones in the study area:

- Environmental protection zones cover the largest area of land in the study area, with this mainly comprising land zoned environmental conservation (E2) at Black Hill, Tarro, Tomago and Heatherbrae. Land zoned for environmental living (E4) is also located at Black Hill and Tarro
- Industrial zones comprise cover the second largest land area, with this mainly comprising general industry zoning (IN1) at Tomago and Heatherbrae. Other land zoned for industrial uses is at Beresfield and Black Hill (zoned light industrial) and Hexham (zoned heavy industrial)
- Land zoned for special purposes include:
 - ‘Special activities’ (SP1) such as the Hunter Water Corporation land, including the Hunter Region Botanic Gardens in Heatherbrae, and Raymond Terrace Wastewater Treatment plant at Raymond Terrace
 - Infrastructure (SP2), which includes roads within the study area, the Main North Rail Line at Tarro, and Newcastle Memorial Park at Beresfield.
- Rural zones mainly comprise rural landscape zoning (RU2) at Heatherbrae and Raymond Terrace.

The Hunter River upstream of the Hexham Bridge is zoned as a recreational waterway (W2). Downstream of the Hexham Bridge, the Hunter River is zoned as both natural waterway (W1) and recreational waterway (W2).

A full list of land use zones in the study area is provided in **Table 4-1** and **Appendix A**.

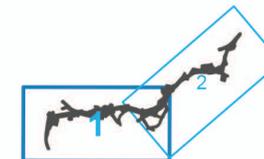
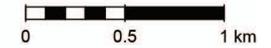
A road corridor for the project was gazetted in the Newcastle LEP and Port Stephens LEP (refer to **Figure 4-3**). Within the Newcastle LGA, the gazetted road corridor extends from the M1 Pacific Motorway at Beresfield south of John Renshaw Drive and the New England Highway, crossing the Hunter River next to Hexham Bridge. Within the Port Stephens Council LGA, the gazetted road corridor generally follows the Pacific Highway and main alignment east of Heatherbrae. Land within the gazetted corridor is zoned:

- Environmental conservation (E2) and environmental living (E4) within the Newcastle LEP
- Infrastructure (SP2) within the Port Stephens LEP.



- Study area
 - Construction footprint
 - LEP gazetted road
- Land Use Zoning
- | | | |
|--|---|--|
| <ul style="list-style-type: none"> E2- Environmental Conservation E3- Environmental Management E4- Environmental Living IN1- General Industrial IN2- Light Industrial IN3- Heavy Industrial R2- Low Density Residential R3- Medium Density Residential | <ul style="list-style-type: none"> RE1- Public Recreation RE2- Private Recreation RU1- Primary Production RU2- Rural Landscape SP1- Special Activities SP2- Infrastructure W1- Natural Waterways W2- Recreational Waterways | <ul style="list-style-type: none"> B1- Neighbourhood Centre B2- Local Centre |
|--|---|--|

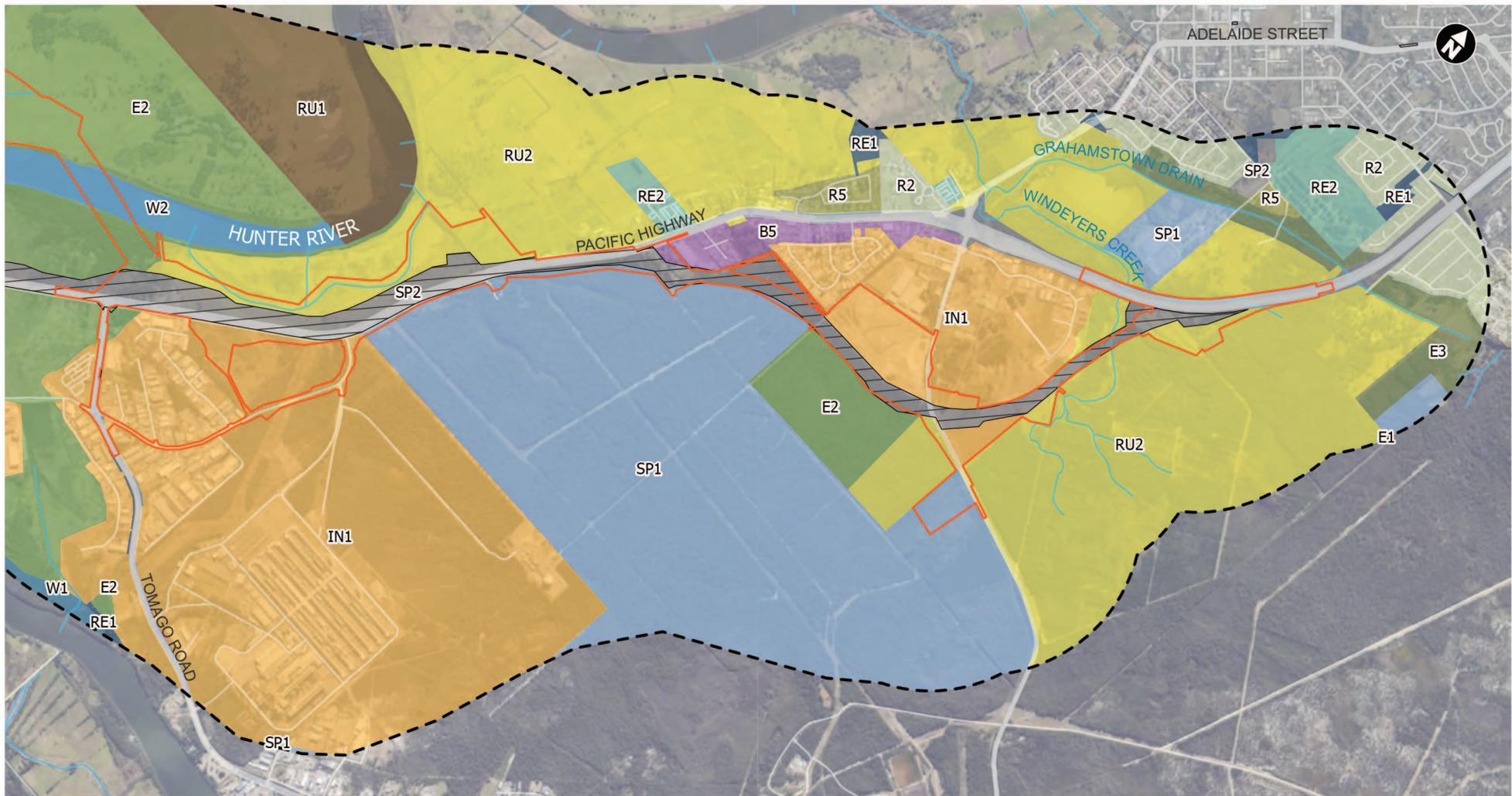
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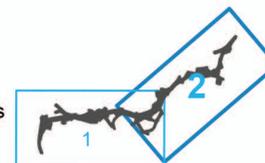
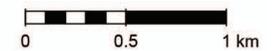
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Figure 4-3 Land use zones within the study area (map 1 of 2)



- Study area
- Construction footprint
- LEP gazetted road
- Land Use Zoning
- B5- Business Development
- E1- National Parks and Nature Reserves
- E2- Environmental Conservation
- E3- Environmental Management
- IN1- General Industrial
- R2- Low Density Residential
- R5- Large Lot Residential
- RE1- Public Recreation
- RE2- Private Recreation
- RU1- Primary Production
- RU2- Rural Landscape
- SP1- Special Activities
- SP2- Infrastructure
- W1- Natural Waterways
- W2- Recreational Waterways

Data source: DPIE 2020



Page 2 of 2

Date: 27/10/2020 Path: I:\230000\22_Spatial\GIS\Directory\Templates\Figures\EIS3_TechnicalReports\LandUse_Property

Figure 4-3 Land use zones within the study area (map 2 of 2)

The objectives for land use zones in the study area are described in **Table 4-1**. The land use zones within the construction and operational footprint of the project are shaded grey.

Table 4-1 Land use zone objectives

| Land use zone | Newcastle LEP – objectives | Port Stephens LEP – objectives |
|---------------------------------------|---|---|
| B1 Neighbourhood centre | <ul style="list-style-type: none"> To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood To provide for residential development that maintains active retail frontages in order to contribute to a safe, attractive, friendly, accessible and efficient pedestrian environment To maintain the hierarchy of urban centres throughout the City of Newcastle and not prejudice the viability of centres within Zone B2 Local Centre or Zone B3 Commercial Core. | <ul style="list-style-type: none"> To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood. |
| B2 Local centre | <ul style="list-style-type: none"> To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area To encourage employment opportunities in accessible locations To maximise public transport patronage and encourage walking and cycling To provide for residential development that maintains active retail and business frontages in order to contribute to a safe, attractive, friendly, accessible and efficient pedestrian environment To maintain the hierarchy of urban centres throughout the City of Newcastle and not prejudice the viability of the Newcastle City Centre. | <ul style="list-style-type: none"> To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area To encourage employment opportunities in accessible locations To maximise public transport patronage and encourage walking and cycling. |
| B5 Business development | <ul style="list-style-type: none"> To enable a mix of business and warehouse uses, and specialised retail premises that require a large floor area, in locations that are close to, and that support the viability of, centres To accommodate a wide range of employment generating uses and associated support facilities including light industrial, transport and storage activities. | <ul style="list-style-type: none"> To enable a mix of business and warehouse uses, and specialised retail premises that require a large floor area, in locations that are close to, and that support the viability of, centres. |
| E1 National parks and nature reserves | <ul style="list-style-type: none"> To enable the management and appropriate use of land that is reserved under the <i>National Parks and Wildlife Act 1974</i> or that is acquired under Part 11 of that Act To enable uses authorised under the <i>National Parks and Wildlife Act 1974</i> To identify land that is to be reserved under the <i>National Parks and Wildlife Act 1974</i> and to protect the environmental significance of that land. | |
| E2 Environmental conservation | <ul style="list-style-type: none"> To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values To prevent development that could destroy, damage or otherwise have an adverse effect on those values To provide for the management of the majority of the Hunter River floodplain by restricting the type and intensity of development to that compatible with the anticipated risk to life and property To provide for the conservation, enhancement and protection of the Hexham Wetlands. | <ul style="list-style-type: none"> To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values To prevent development that could destroy, damage or otherwise have an adverse effect on those values. |

| Land use zone | Newcastle LEP – objectives | Port Stephens LEP – objectives |
|-----------------------------|--|--|
| E3 Environmental management | <ul style="list-style-type: none"> To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values To provide for a limited range of development that does not have an adverse effect on those values To provide for the conservation of the rural and bushland character of the land that forms the scenic edge of and the gateway to urban Newcastle. | <ul style="list-style-type: none"> To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values To provide for a limited range of development that does not have an adverse effect on those values. |
| E4 Environmental living | <ul style="list-style-type: none"> To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values To ensure that residential development does not have an adverse effect on those values To conserve the rural or bushland character and the biodiversity or other conservation values of the land To provide for the development of land for purposes that will not, or will be unlikely to, prejudice its possible future development for urban purposes or its environmental conservation. | <ul style="list-style-type: none"> To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values To ensure that residential development does not have an adverse effect on those values. |
| IN1 General industrial | <ul style="list-style-type: none"> To provide a wide range of industrial and warehouse land uses To encourage employment opportunities To minimise any adverse effect of industry on other land uses To support and protect industrial land for industrial uses To allow commercial, retail or other development where it is— <ul style="list-style-type: none"> (i) ancillary to the use of land in this zone for industrial, research, service or storage purposes, or (ii) primarily intended to provide personal services and community facilities to persons occupied or employed in activities otherwise permitted in this zone or for the benefit of the local community. To ensure that any such commercial, retail or other development is unlikely to be prejudicial— <ul style="list-style-type: none"> (i) to employment-generating activities, or (ii) to the viability of existing commercial centres. | <ul style="list-style-type: none"> To provide a wide range of industrial and warehouse land uses To encourage employment opportunities To minimise any adverse effect of industry on other land uses To support and protect industrial land for industrial uses. |
| IN2 Light industrial | <ul style="list-style-type: none"> To provide a wide range of light industrial, warehouse and related land uses To encourage employment opportunities and to support the viability of centres To minimise any adverse effect of industry on other land uses To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area To support and protect industrial land for industrial uses. | |
| IN3 Heavy industrial | <ul style="list-style-type: none"> To provide suitable areas for those industries that need to be separated from other land uses To encourage employment opportunities To minimise any adverse effect of heavy industry on other land uses To support and protect industrial land for industrial uses. | <ul style="list-style-type: none"> Not applicable. |

| Land use zone | Newcastle LEP – objectives | Port Stephens LEP – objectives |
|-------------------------------|--|--|
| R2 Low density residential | <ul style="list-style-type: none"> To provide for the housing needs of the community within a low density residential environment To enable other land uses that provide facilities or services to meet the day to day needs of residents To accommodate a diversity of housing forms that respects the amenity, heritage and character of surrounding development and the quality of the environment. | <ul style="list-style-type: none"> To provide for the housing needs of the community within a low density residential environment To enable other land uses that provide facilities or services to meet the day to day needs of residents To protect and enhance the existing residential amenity and character of the area To ensure that development is carried out in a way that is compatible with the flood risk of the area. |
| R3 Medium density residential | <ul style="list-style-type: none"> To provide for the housing needs of the community within a medium density residential environment To provide a variety of housing types within a medium density residential environment To enable other land uses that provide facilities or services to meet the day to day needs of residents To allow some diversity of activities and densities if – <ul style="list-style-type: none"> (i) the scale and height of proposed buildings is compatible with the character of the locality, and (ii) there will be no significant adverse impact on the amenity of any existing nearby development. To encourage increased population levels in locations that will support the commercial viability of centres provided that the associated new development – <ul style="list-style-type: none"> (i) has regard to the desired future character of residential streets, and (ii) does not significantly detract from the amenity of any existing nearby development. | <ul style="list-style-type: none"> To provide for the housing needs of the community within a low density residential environment To enable other land uses that provide facilities or services to meet the day to day needs of residents To protect and enhance the existing residential amenity and character of the area To ensure that development is carried out in a way that is compatible with the flood risk of the area. |
| R5 Large lot residential | <ul style="list-style-type: none"> Not applicable. | <ul style="list-style-type: none"> To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future To ensure that development in the area does not unreasonably increase the demand for public services or public facilities To minimise conflict between land uses within this zone and land uses within adjoining zones. |
| RE1 Public recreation | <ul style="list-style-type: none"> To enable land to be used for public open space or recreational purposes To provide a range of recreational settings and activities and compatible land uses To protect and enhance the natural environment for recreational purposes. | |

| Land use zone | Newcastle LEP – objectives | Port Stephens LEP – objectives |
|-------------------------|---|---|
| RE2 Private recreation | <ul style="list-style-type: none"> To enable land to be used for private open space or recreational purposes To provide a range of recreational settings and activities and compatible land uses To protect and enhance the natural environment for recreational purposes. | |
| RU1 Primary production* | <ul style="list-style-type: none"> Not applicable. | <ul style="list-style-type: none"> To encourage sustainable primary industry production by maintaining and enhancing the natural resource base To encourage diversity in primary industry enterprises and systems appropriate for the area To minimise the fragmentation and alienation of resource lands To minimise conflict between land uses within this zone and land uses within adjoining zones. |
| RU2 Rural landscape | <ul style="list-style-type: none"> Not applicable. | <ul style="list-style-type: none"> To encourage sustainable primary industry production by maintaining and enhancing the natural resource base To maintain the rural landscape character of the land To provide for a range of compatible land uses, including extensive agriculture. |
| SP1 Special activities | <ul style="list-style-type: none"> To provide for special land uses that are not provided for in other zones To provide for sites with special natural characteristics that are not provided for in other zones To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land. | <ul style="list-style-type: none"> To provide for special land uses that are not provided for in other zones To provide for sites with special natural characteristics that are not provided for in other zones To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land To ensure the protection of water catchment areas to safeguard the quality and quantity of groundwater and surface water To facilitate the provision of infrastructure provided by Hunter Water Corporation. |
| SP2 Infrastructure | <ul style="list-style-type: none"> To provide for infrastructure and related uses To prevent development that is not compatible with or that may detract from the provision of infrastructure. | |

| Land use zone | Newcastle LEP – objectives | Port Stephens LEP – objectives |
|---------------------------|--|---|
| W1 Natural waterways | <ul style="list-style-type: none"> • Not applicable. | <ul style="list-style-type: none"> • To protect the ecological and scenic values of natural waterways • To prevent development that would have an adverse effect on the natural values of waterways in this zone • To provide for sustainable fishing industries and recreational fishing. |
| W2 Recreational waterways | <ul style="list-style-type: none"> • To protect the ecological, scenic and recreation values of recreational waterways • To allow for water-based recreation and related uses • To provide for sustainable fishing industries and recreational fishing. | |

Notes:

1. *While the project is not located within the Maitland LGA, part of the study area falls within the Maitland LGA west of the Hunter River, which is subject to the Maitland LEP. The study area incorporates land within the RU1 Primary production zone, the objectives of which are consistent with the objectives for the Port Stephens LEP.
2. Land use zones shaded grey are in the construction and operational footprints.
3. Where objectives are the same in each LEP the column has been combined.

Sources: Newcastle LEP (CoN 2012 on 17 April 2020), Port Stephens LEP (PSC, 2013 on 17 April 2020) and Maitland LEP 2011 (on 17 April 2020).

4.5 Mining

A search of the DPIE MinView database (6 July 2020) identified a Mining Lease (ML) and Exploration Licence (EL) within or near the study area, details of which are summarised in **Table 4-2**.

Table 4-2 Mining leases

| Title | Title holder | Expiry date | Resource | Title area (ha) |
|--------|------------------------|-------------------------------|-----------------|-----------------|
| ML1618 | Donaldson Coal Pty Ltd | 15 May 2029 | Coal | 2,755 |
| EL5497 | Donaldson Coal Pty Ltd | 21 July 2019 (renewal sought) | Coal, oil shale | 4,687 |

ML1618 covers the Donaldson Coal’s Abel underground coal mining operation at Black Hill, which is located west of the M1 Pacific Motorway and southwest of Beresfield (refer to **Figure 4-4**). The Abel underground coal mine was placed in care and maintenance in 2016 (Donaldson Coal, 2018). The project is located with EL5497 held by Donaldson Coal Pty Ltd, a wholly owned company of Yancoal Australia.

The study area is also covered by an assessment lease (ALA71) held by Donaldson Coal Pty Ltd. The application was made on 8 July 2019 and seeks approval for coal and oil shale. An assessment lease allows the holder to maintain an authority over a potential project area and the lease holder can continue exploration to assess the viability of commercial mining. In addition, the Black Hill Mine Subsidence District is located within the study area, as described in Chapter 22 of the EIS (safety and risk).

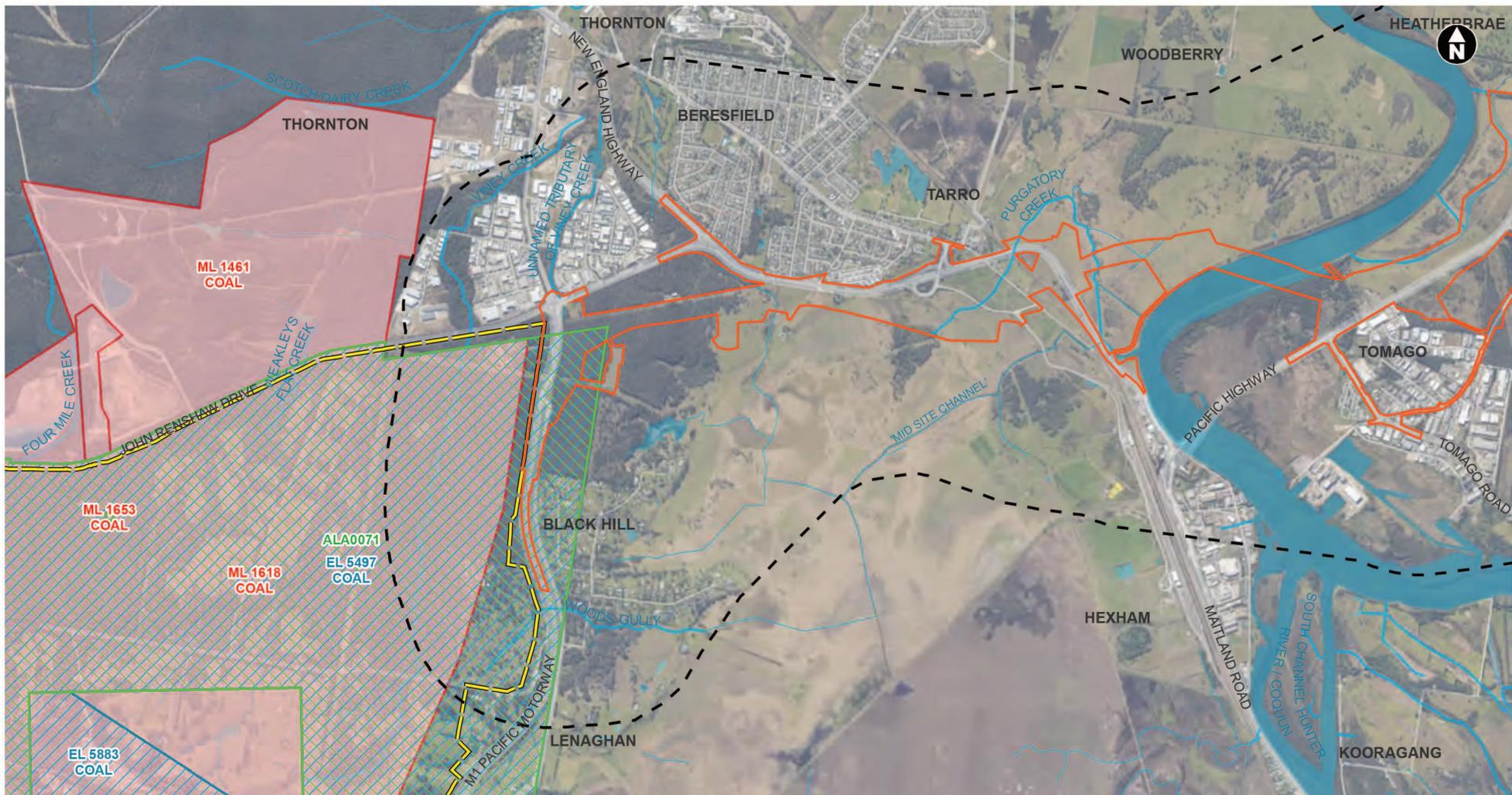
There are no other mineral or petroleum exploration licences, mining / production leases or licence / lease applications within the study area.

4.6 Utilities

Several utilities and associated infrastructure are in the study area including electricity, telecommunications, natural gas and water. These are shown on **Figure 4-5**, with the following existing utilities located within or near the construction footprint:

- Electricity supply and street lighting: TransGrid (high voltage transmission lines) and Ausgrid
- Telecommunications: Telstra, Optus, NBN and Nextgen optic fibre and telephone cables
- Gas: Jemena and AGL
- Water and sewer services and infrastructure: Operated by Hunter Water Corporation and includes the Chichester Trunk Gravity Water Main.

AGL also proposes to construct a 250 Mega Watt (MW) gas fired power station (the proposed power station) within the study area at Tomago with gas pipelines and electricity transmission lines. The proposed power station is due to be operational prior to the commencement of construction of the project. The site for the proposed power station is located between the Pacific Highway and Old Punt Road, north of the Tomago industrial area.



- Construction footprint
- Study area
- Exploration licence
- Mining lease
- Mining assessment lease

Black Hill mine subsidence district

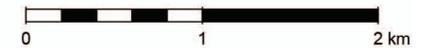
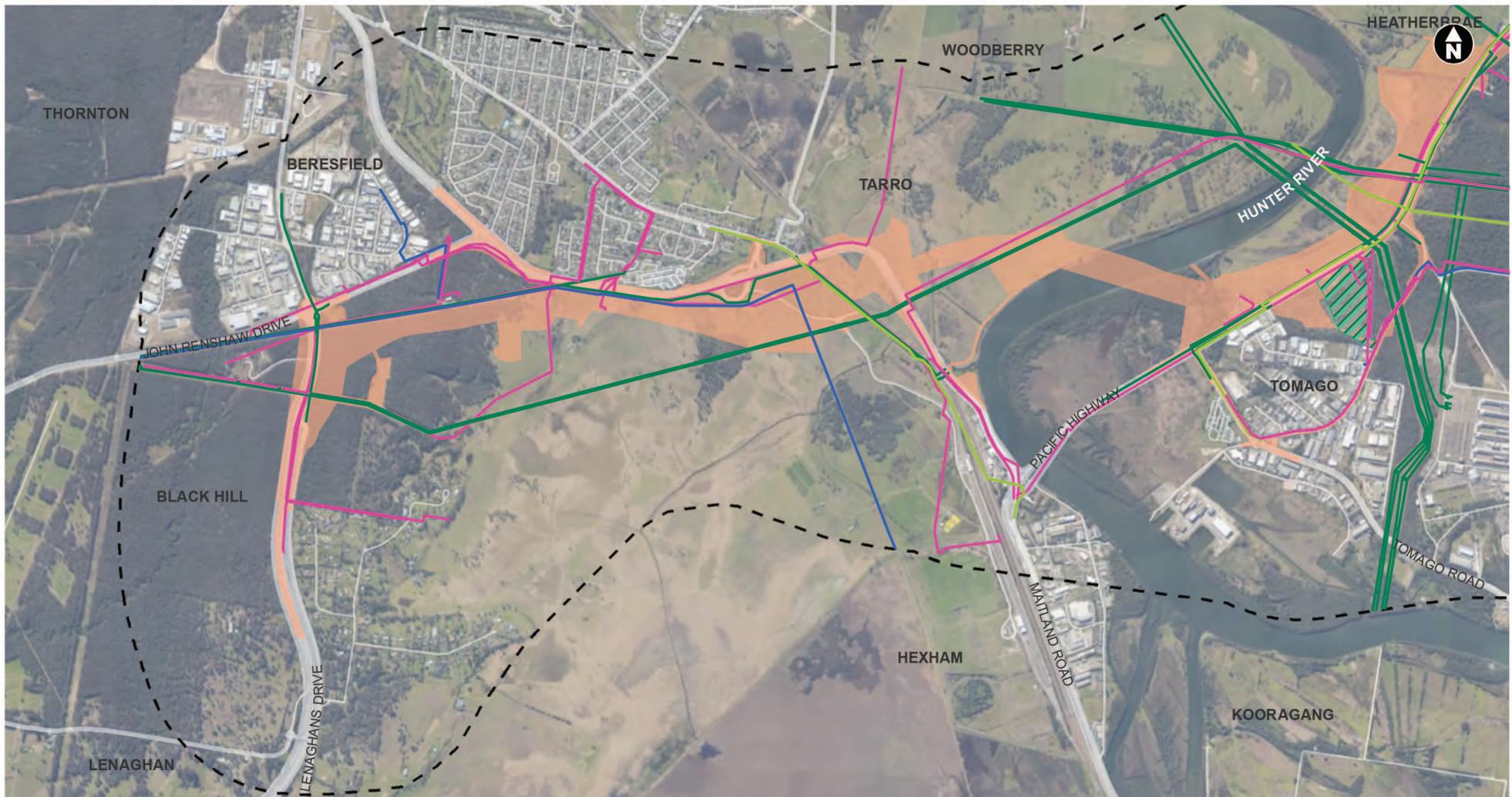
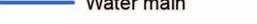


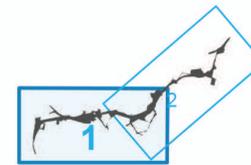
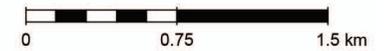
Figure 4-4 Mining activities within the study area

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-  Study area
-  Construction footprint
- Major utilities**
-  Electricity
-  Gas
-  Telecommunication
-  Water main

 Proposed location of the Newcastle Power Station

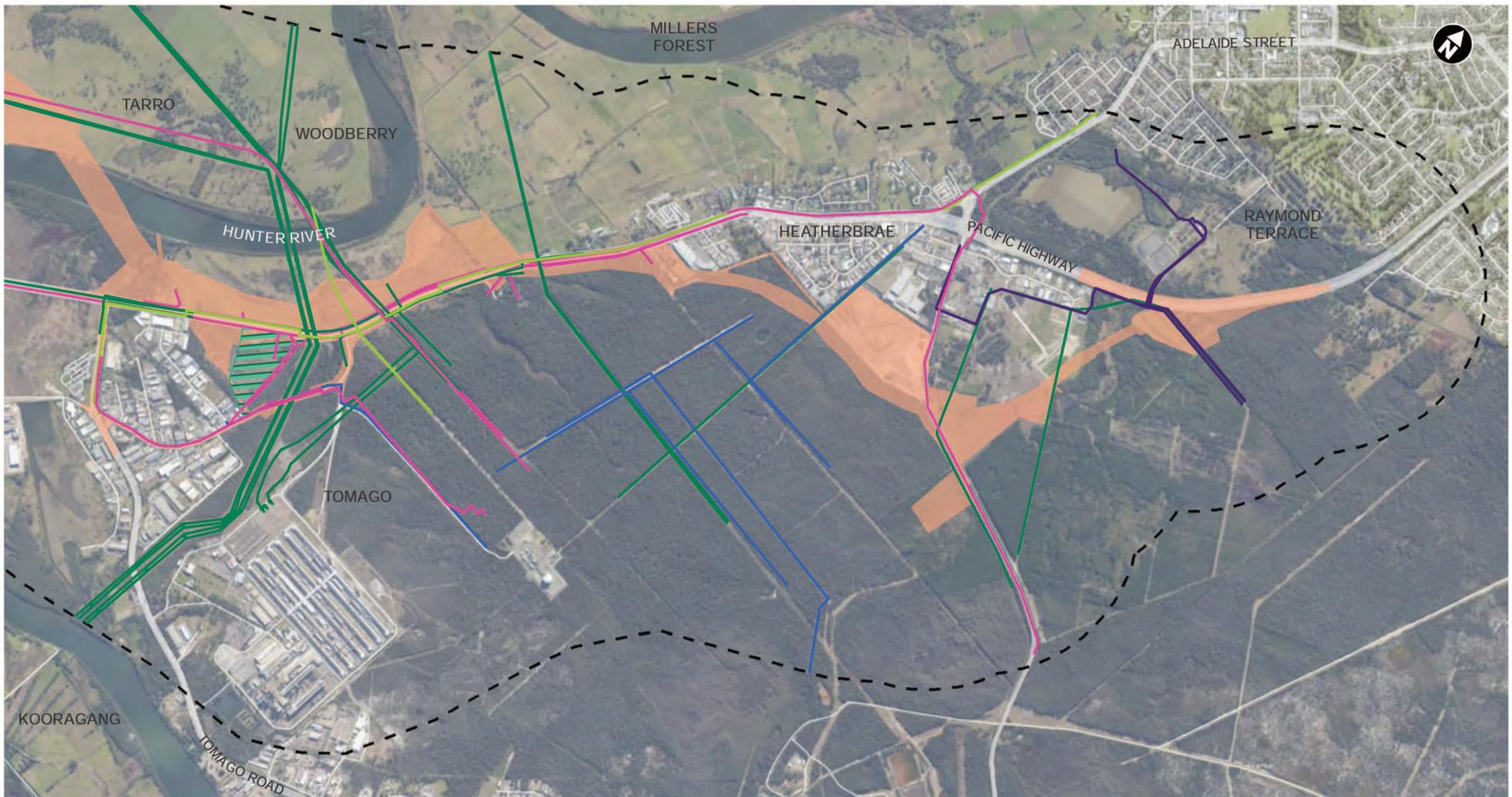


page 1 of 2



Figure 4-5 Major utilities within the study area (map 1 of 2)

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--- Study area

Construction footprint

Major utilities

Electricity

Gas

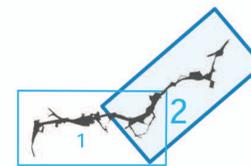
Sewer main

Telecommunication

Water main



Proposed location of the Newcastle Power Station



page 2 of 2

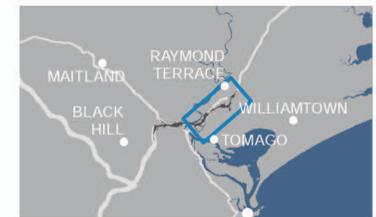


Figure 4-5 Major utilities within the study area (map 2 of 2)

Date: 23/10/2020 Path: J:\EIP\Projects\04_Eastern\A230000\2_Spatial\GIS\Directory\Templates\Figures\EIS\3_Technical\Reports\Land_Use\A230000_CD_LU_010_Uilities_JAC_A41_85000_V04_mxd

4.7 Water users

The *Water Management Act 2000* allows for the extraction of water from surface water and groundwater sources without an access licence to provide basic landholder rights, for example domestic and stock rights). All water extraction that is not for basic landholder rights must be authorised by an access licence.

There are no water access licences within the construction footprint. Five water access licences are registered within the study area (**Table 4-3**). These provide water for irrigation, industrial uses, drainage, dewatering and at the Hunter Regional Botanic Gardens. Further details are also provided in the Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS).

Table 4-3 Water access licences registered within one kilometre of the project

| Water access licence No. | Water access licence category | Work type | Purpose |
|---------------------------|-------------------------------|--|--|
| Newcastle water source | | | |
| 18727 | Aquifer | Extraction work groundwater | Irrigation |
| 18733 | Unregulated River | Diversion work – pumps / other; storages | Irrigation |
| Tomago groundwater source | | | |
| 9641 | Aquifer | Extraction work groundwater | Hunter Region Botanic Gardens |
| 40954 | Aquifer | Storages | Irrigation |
| 6082 | Aquifer | Storages / extraction works groundwater | Industrial, drainage, dewatering (groundwater) |

The Tomago Sandbeds extend from Tomago to Port Stephens. The Tomago Sandbeds are within land owned by Hunter Water Corporation and are also located within the Tilligerry State Conservation Area and a designated 'Special Area' in the *Hunter Water Act 1991* protected as a public drinking water supply by Hunter Water Corporation (Hunter Water, 2020). The Tomago Sandbeds provide about 20 per cent of the Lower Hunter's drinking water, reducing the load on surface water sources of Chichester Dam and Grahamstown Dam and allowing greater overall yield from the total Lower Hunter water supply system (Hunter Water, 2019).

Details on water users such as recreational and commercial fishers, and oyster and aquaculture farmers are provided in the Socio-economic Working Paper (Appendix M of the EIS).

4.8 Future land use

The study area is covered by the Hunter Regional Plan 2036 (DPE, 2016) and Greater Newcastle Metropolitan Plan 2036 (DPE, 2018), which outlines the future land use vision for the Hunter and Greater Newcastle areas and provide frameworks for land use planning priorities and decisions. Raymond Terrace will be the focus of population and employment growth over the next 20 years. Tomago, Heatherbrae and the convergence of the national road network around Thornton, Beresfield and Black Hill are identified as significant employment precincts. The Greater Newcastle Metropolitan Plan (DPE, 2018) also identifies Beresfield, Black Hill and Tomago as major employment precincts and trading hubs within Greater Newcastle. West Wallsend, Cameron Park and Edgeworth south of the study area are identified as urban release areas and will be a focus of future housing and urban renewal opportunities.

Beresfield and Black Hill are proposed to be a freight and logistics hub, with complementary manufacturing and light industrial activity. Three precincts are identified within this location, including:

- Beresfield Precinct, which will support freight and logistics, manufacturing, and other light industrial uses
- Emerging Black Hill Precinct, located west of the M1 Motorway, which is proposed to be the subject of a master plan that considers freight and logistic uses, the adjoining mine site and road access to John Renshaw Drive
- Thornton Precinct, which is proposed to support expanded business and light industrial uses.

Tomago is proposed to be an advanced manufacturing and industrial area. Local planning for the Tomago Industrial Precinct will look to enable the efficient movement of goods by protecting freight routes connecting Tomago to Newcastle Airport and Port of Newcastle. The Tomago Shipbuilding Precinct located next to the Hunter River, is identified as a location to promote the development of shipbuilding industries that maximise opportunities to secure defence contracts.

5. Assessment of potential impacts

5.1 Property

5.1.1 Concept design development

Planning for the project began in October 2004 with the investigation of route options, and selection of a preferred route that was displayed to the public in 2008. Transport considered comments received during the public display and issued a preferred concept design in 2010.

The preferred concept design corridor (including refinements resulting from submissions) was reserved in the Newcastle LEP and Port Stephens LEP. Refinements to the preferred concept design were made as described in Chapter 4 of the EIS.

The concept design for the project was developed using a multi-disciplinary process that identified and assessed routes against a range of engineering, environmental, social, land-use and economic criteria. This process (as described in Chapter 4 of the EIS) ultimately determined that the project represented the best balance after a multi-criteria analysis of all known constraints and opportunities.

The following summarises some of the key refinements that were made to the project design to address property and land use issues.

- Property severance impacts:
 - Reducing the area of property acquisition and severance of agricultural land in Black Hill and Tarro by moving the main alignment next to existing road infrastructure
 - Locating the main alignment next to existing road infrastructure north of Tomago to minimise impacts to property and vegetated areas
 - The viaduct across the Hunter River floodplain allows access and use of land either side of the project.
- Access impacts:
 - Maintaining access to property through the provision of new accesses (where required) including maintaining direct access to the Pacific Highway at the Hunter Region Botanic Gardens
 - Development of an oversize overmass (OSOM) strategy to allow for large freight movements to adjoining employment and heavy industry land uses.
- Impacts on future land use development:
 - Consolidation of the Tomago and Heatherbrae interchanges into a single interchange to minimise impacts on land proposed for the proposed power station
 - Maintaining the main alignment on the approach to the Raymond Terrace Interchange behind the industrial estate to minimise impacts to the industrial development.
- Other property impacts:
 - Moving the viaduct alignment to the south to address concerns raised by residents near to the project
 - Raising the height of the motorway through the Hunter Water Corporation land in the Tomago Sandbeds Catchment Area to aid in avoiding future water quality impacts on the catchment area.

5.1.2 Directly affected properties

This section presents information on the number of properties affected by the project. Some of the properties in the study area that would be directly affected by the construction and operation of the project comprise multiple individual lots. Adjoining lots held by the same owner are assumed to form part of the same property.

Construction and operation of the project would directly impact on privately owned properties and properties owned by the NSW Government, local councils and utility authorities. Land owned by Transport would also be used for the construction and operation of the project, including land previously purchased for the project and land within existing transport corridors.

Ownership of affected land

To date, 43 lots have been progressively purchased by Transport for the project held over several properties by private landowners and local councils.

A total of 36 lots held by 18 property owners would need to be acquired for the project, in addition to those previously purchased by Transport. The project would also require temporary agreements with landowners to accommodate ancillary construction facilities such as worksites, bridge construction support, compounds, laydown areas and parking area. Details on the properties subject to property acquisition and temporary agreements are provided in **Table 5-1** and shown in **Figure 5-1**.

Ownership of land directly affected by the construction and operation of the project (that is, property acquisition or temporary lease) includes:

- Fifteen properties that are privately owned, including nine properties that are owned by a company
- Three properties owned by the City of Newcastle
- One property owned by the rail operator Aurizon
- Two properties owned by the energy provider AGL
- Five properties owned or managed by government agencies such as Hunter Water Corporation and Crown Land.

A strip of Crown land temporarily and permanently impacted by the project is located along the banks of the Hunter River. Details of the affected area are summarised in **Table 5-1**.

Land within the Main North Rail line corridor owned by Transport and maintained by the Australian Rail Track Corporation (ARTC) would also be directly affected by the project, although this would not impact on the ongoing operation of the rail line.

Land use

Most land directly affected by the project comprises rural uses, including land used for grazing, utilities infrastructure, including electricity transmission lines and water and gas pipelines, and areas of native vegetation. Dwellings are located on five properties subject to acquisition or temporary lease, including four properties that comprise dwellings associated with rural land uses. One property also comprises a residential village at Beresfield, although the directly affected area comprises vacant land outside of the area covered by the village complex. Five properties currently contain commercial uses, while two properties contain social infrastructure, including sporting fields and the Hunter Region Botanic Gardens.

Partial acquisition of rural properties may require the demolition or relocation of infrastructure such as fencing, dams, sheds and other directly affected structures prior to construction. This would be carried out in consultation with the property owner. The project has been designed to minimise the potential for partial acquisition of land to result in severance or fragmentation of rural properties. The viaduct across the Hunter River floodplain at Tarro and Woodberry would allow access to be maintained within and between

properties located either side of the project. Access to residual property parcels would be maintained via existing local roads or new service roads constructed as part of the project. Further information about the treatment of residual land is provided in **Section 5.1.4**.

Properties identified for temporary lease during construction generally comprise areas of rural land, and industrial and commercial uses. Use of, and access to, land subject to temporary lease arrangements would be disrupted during the construction period. Following construction, these areas would be reinstated to pre-construction use, including the reinstatement of any affected infrastructure such as fencing, as agreed with the property owner. Rehabilitation of rural land subject to temporary lease would be carried out in accordance with relevant guidelines to minimise the potential for ongoing risks to rural land uses, for example increased erosion.

Acquisition process

Acquisitions for the project would be carried out by Transport in accordance with the provisions of the *NSW Land Acquisition (Just Terms Compensation) Act 1991* (the Act) and the Land Acquisition Reform 2016 process (<https://www.propertyacquisition.nsw.gov.au/>). The Act provides the basis for an appropriate valuation process and the fair assessment of compensation.

Where properties are only partly affected by the project, Transport would generally carry out a partial acquisition of the directly affected portion. Transport would consider the acquisition of any residual parcels created by the location and design of the project. Further information about the treatment of residual land is provided in **Section 5.1.4**.

Table 5-1 Summary of properties to be acquired or leased

| Property ID | Lot/ DP [^] (Bold to be acquired) [^] | Ownership | Land use* | Total property area (ha) | Property within operational footprint (ha) (per cent of total area) † | Additional property required for construction (ha) (per cent of total area) † | Infrastructure affected |
|-------------|--|--------------------------|--|--------------------------|---|---|---|
| 1 | 10/DP1186448 | City of Newcastle | Vacant / vegetated land | 1.55 | – | 1.47 (94.3%) | – |
| 2 | 102/DP846451, 1617/DP1153099 | Hunter Water Corporation | Access track / electricity transmission line easement | 1.91 | 0.04 (1.9%) | 1.88 (98.1%) | – |
| 3 | 13/DP553141, 12/DP553141 | City of Newcastle | Landscaped buffer for Pasadena Crescent Reserve Soccer Fields | 2.64 | – | 0.25 (9.5%) | – |
| 4 | 52/DP551256 | City of Newcastle | Utilities infrastructure | 0.41 | – | 0.41 (100%) | Council facility, including fencing and sheds |
| 5 | 1/DP1181217 | Private – company | Unused land (Palm Valley Village covering remainder of property) | 2.34 | 0.27 (11.6%) | – | – |
| 6 | 2/DP873320, 4/DP735235 | Private | Rural land with dwelling | 203.26 | 14.61 (7.2%) | 2.15 (1.1%) | Dwelling, business signage, fencing, stock yards, access tracks |
| 7 | 103/DP1084709, 1/DP735456, 101/DP1084709, 32/DP234979, 9/DP842856 | Private | Rural land (grazing), electricity transmission line easement | 21.01 | 18.30 (87.1%) | – | Fencing, dam |
| 8 | 1/DP128309 | Hunter Water Corporation | Underground water pipeline easement | 2.44 | 0.68 (27.9%) | 0.32 (13.2%) | Fencing |

| Property ID | Lot/ DP [^] (Bold to be acquired) [^] | Ownership | Land use* | Total property area (ha) | Property within operational footprint (ha) (per cent of total area) † | Additional property required for construction (ha) (per cent of total area) † | Infrastructure affected |
|-------------|---|----------------------------|---|--------------------------|---|---|---------------------------------|
| 9 | 102/DP1084709, 10/DP735235, 2/DP735456, 104/DP1084709, 5/DP227556, 6/DP227556, 13/DP842856 | Aurizon Operations Limited | Access road for Hexham Train Support Facility, rural land | 47.50 | 12.20 (25.7%) | 5.24 (11.0%) | Fencing, access tracks |
| 10 | 12/DP842856 | Hunter Water Corporation | Water utilities infrastructure | 0.01 | – | 0.01 (100%) | Pipeline infrastructure |
| 11 | 100/DP1044020 | Private | Rural land with dwelling | 8.30 | 0.95 (11.4%) | 3.89 (46.9%) | – |
| 12 | 11/DP1149091, 1/DP520550 | Private | Rural land with dwelling | 53.68 | – | 2.23 (4.1%) | Fencing, signage, water channel |
| 13 | 1/DP1165954 | Private | Rural land, access track | 0.21 | – | 0.01 (6.5%) | – |
| 14 | 7300/DP1163794, 7310/DP1165716 | Crown land | Riverbank of Hunter River | 15.15 | 1.36 (9.0%) | 0.55 (3.7%) | – |
| 15 | 102/DP1038663 | Private – company | Vegetated land / wetland | 32.60 | 9.97 (30.6%) | – | – |
| 16 | 43/DP558481 | Private | Vacant land (part of larger property accommodating Tomago Village Van Park) | 1.81 | 0.32 (17.9%) | – | – |
| 17 | 1/DP32464 | Private – company | Commercial use | 0.28 | – | 0.28 (100%) | Shed |
| 18 | 2/DP1043561, 3/DP1043561 | AGL Macquarie Pty Ltd | Rural land with dwelling (site of proposed power station) | 27.91 | 6.89 (24.7%) | 3.01 (10.8%) | Dwelling |

| Property ID | Lot/ DP [^] (Bold to be acquired) [^] | Ownership | Land use* | Total property area (ha) | Property within operational footprint (ha) (per cent of total area) † | Additional property required for construction (ha) (per cent of total area) † | Infrastructure affected |
|-------------|--|--------------------------|--|--------------------------|---|---|--|
| 19 | 1203/DP1229590 | AGL Energy Limited | Gas pipeline easement (Newcastle Gas Storage Facility) | 7.47 | 0.42 (5.6%) | – | Access track |
| 20 | 4/DP1043561, 202/DP1173564 | Private – company | Vegetated land, electricity transmission line easement, access road for Tomago Aluminium smelter | 231.85 | 3.06 (1.3%) | 0.83 (0.4%) | – |
| 21 | 1/DP748716, 18/DP1082495, 2/DP748716, 2/DP450444, 211/DP1103169, 1/DP830246, 1/DP450444, 2/DP830246 | Hunter Water Corporation | Vegetated land, electricity transmission line easements, Hunter Regional Botanic Gardens | 655.84 | 16.98 (2.6%) | 11.07 (1.7%) | – |
| 22 | 905/DP1256183 | Private – company | Vegetated land | 459.01 | 18.65 (4.1%) | 31.33 (6.8%) | – |
| 23 | 1/DP1169886 | Private – company | Evergreen Horse Stud (training track and paddocks) | 171.32 | 1.43 (0.8%) | 8.34 (4.9%) | Training track, fencing, horse paddocks, access tracks |
| 24 | B/DP163470 | Private – company | Commercial use | 1.46 | 1.46 (100%) | – | Shed |
| 25 | 1/DP1187992 | Private – company | Landscaped buffer for commercial use | 4.65 | 0.39 (8.5%) | – | – |
| 26 | 906/DP1256183 | Private – company | Commercial use, forestry plantation | 63.29 | 9.92 (15.7%) | 9.90 (15.6%) | – |

Notes: *land use based on the review of aerial photography, † – no area of property within the operational footprint / requiring additional land for construction. ^Lot/DP in bold are those currently identified for acquisition.

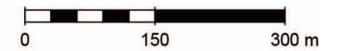


- Construction footprint
- Operational footprint

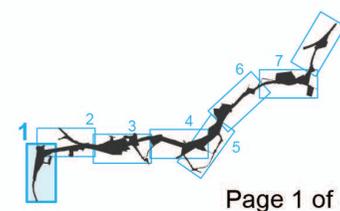
- Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

- Project land owned by Transport

- Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 1 of 8



Figure 5-1 Properties to be acquired or leased (map 1 of 8)

Date: 23/10/2020 Path: J:\E\Projects\04_Eastern\A23000022_Spatial\GIS\Directory\Templates\Figures\IBS3_TechnicalReports\Land_Use\A2300009_CD_LU_009_PropertiesImpacted_JAC_A41_0250_V04.mxd



Construction footprint

Operational footprint

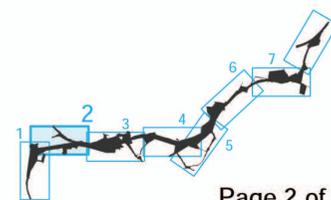
Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

Project land owned by Transport

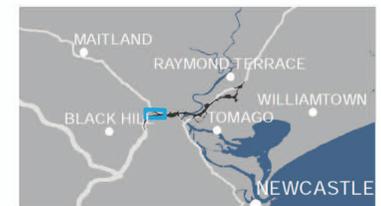
Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.

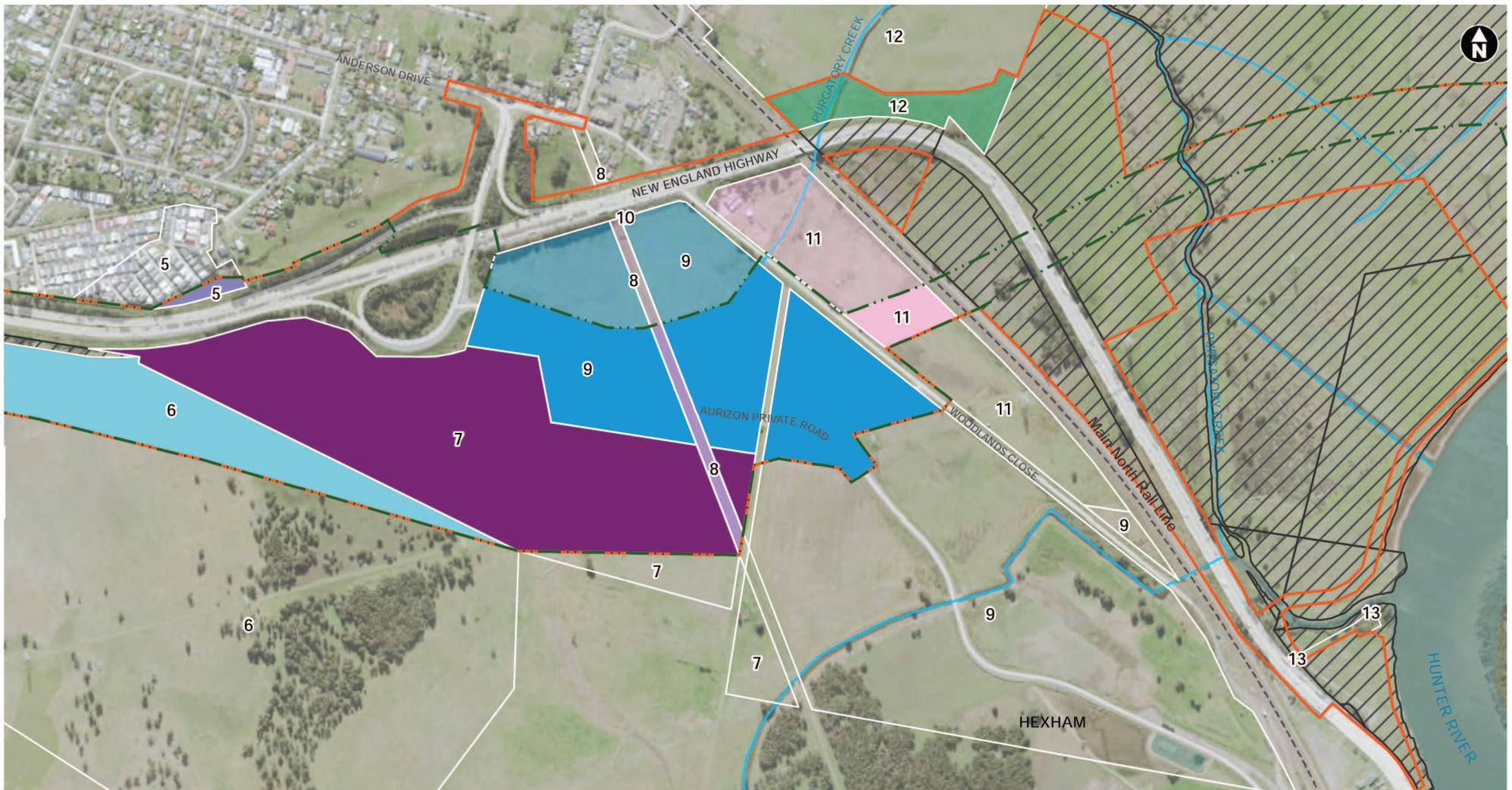


Page 2 of 8



Date: 23/10/2020 Path: J:\E\Projects\04_Eastern\IA23000\022_Spatial\GIS\Directory\Templates\Figures\IES\3_TechnicalReports\Land_Use\IA23000_CD_LU_009_PropertiesImpacted_IAC_A4L_#250_V04.mxd

Figure 5-1 Properties to be acquired or leased (map 2 of 8)



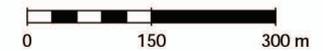
Construction footprint

Operational footprint

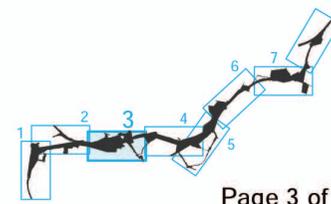
Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

Project land owned by Transport

Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 3 of 8

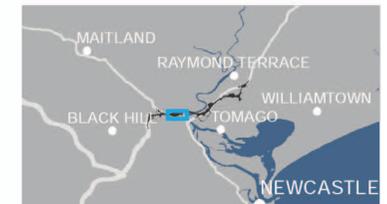
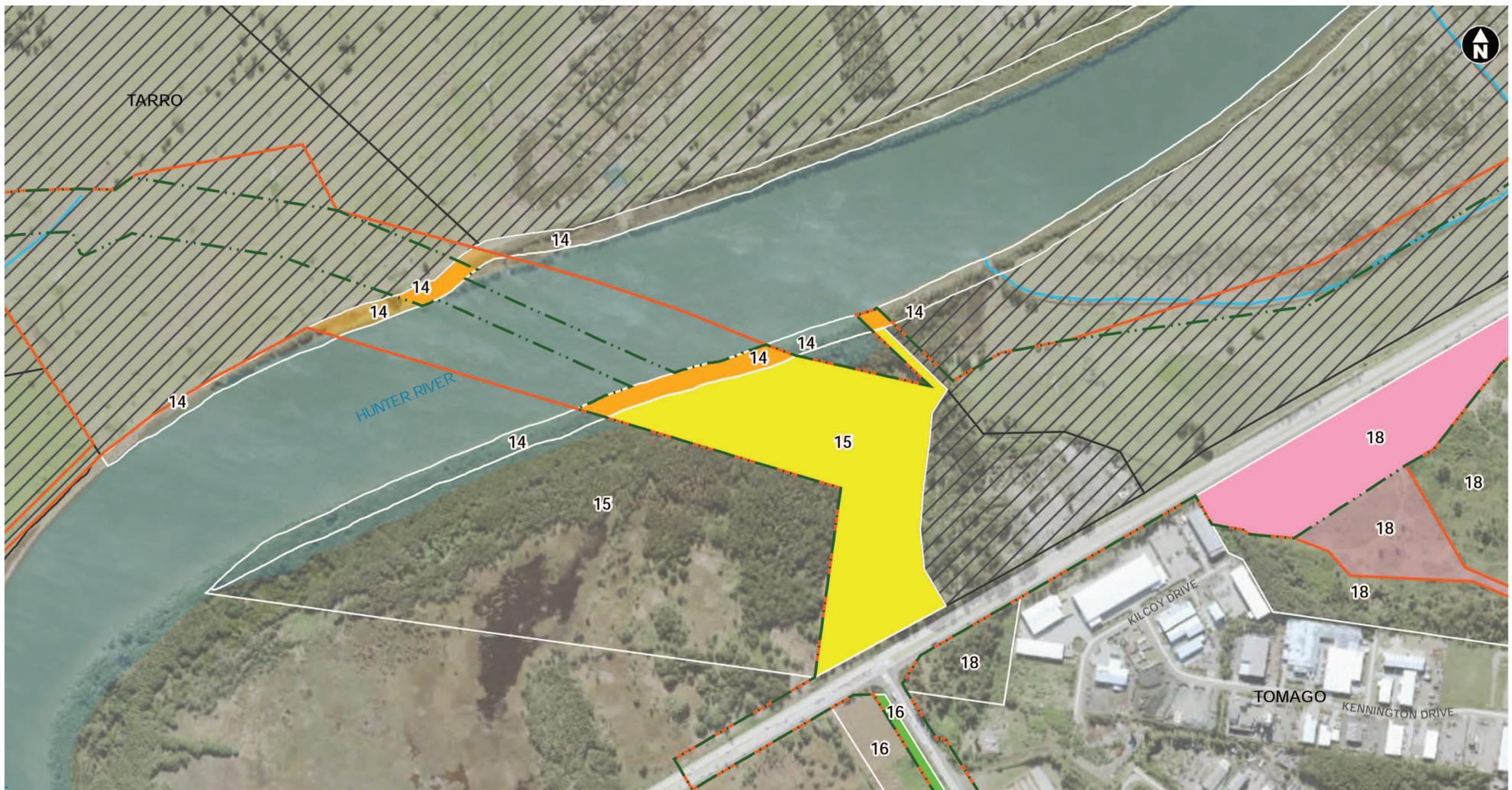


Figure 5-1 Properties to be acquired or leased (map 3 of 8)

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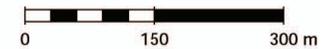


 Construction footprint
 Operational footprint

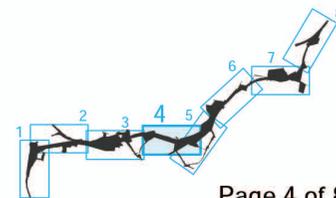
 Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

 Project land owned by Transport

 Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 4 of 8

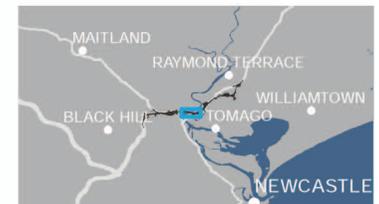


Figure 5-1 Properties to be acquired or leased (map 4 of 8)

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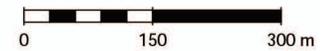


- Construction footprint
- Operational footprint

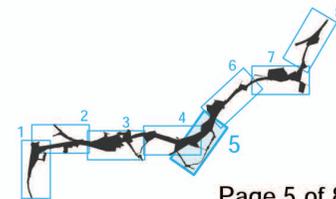
- Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

- Project land owned by Transport

- Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 5 of 8

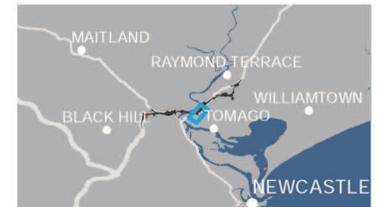


Figure 5-1 Properties to be acquired or leased (map 5 of 8)

Date: 23/10/2020 Path: J:\E\Projects\04_Eastern\IA230000\22_Spatial\GIS\Directory\Templates\Figures\IEIS\3_TechnicalReports\Land_Use\IA230000_CD_LU_009_PropertiesImpacted_IAC_A41_B250_V04.mxd

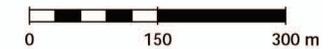


 Construction footprint
 Operational footprint

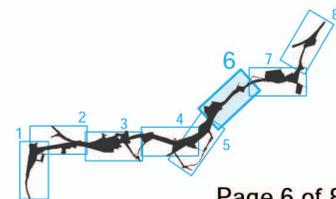
 Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

 Project land owned by Transport

 Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.

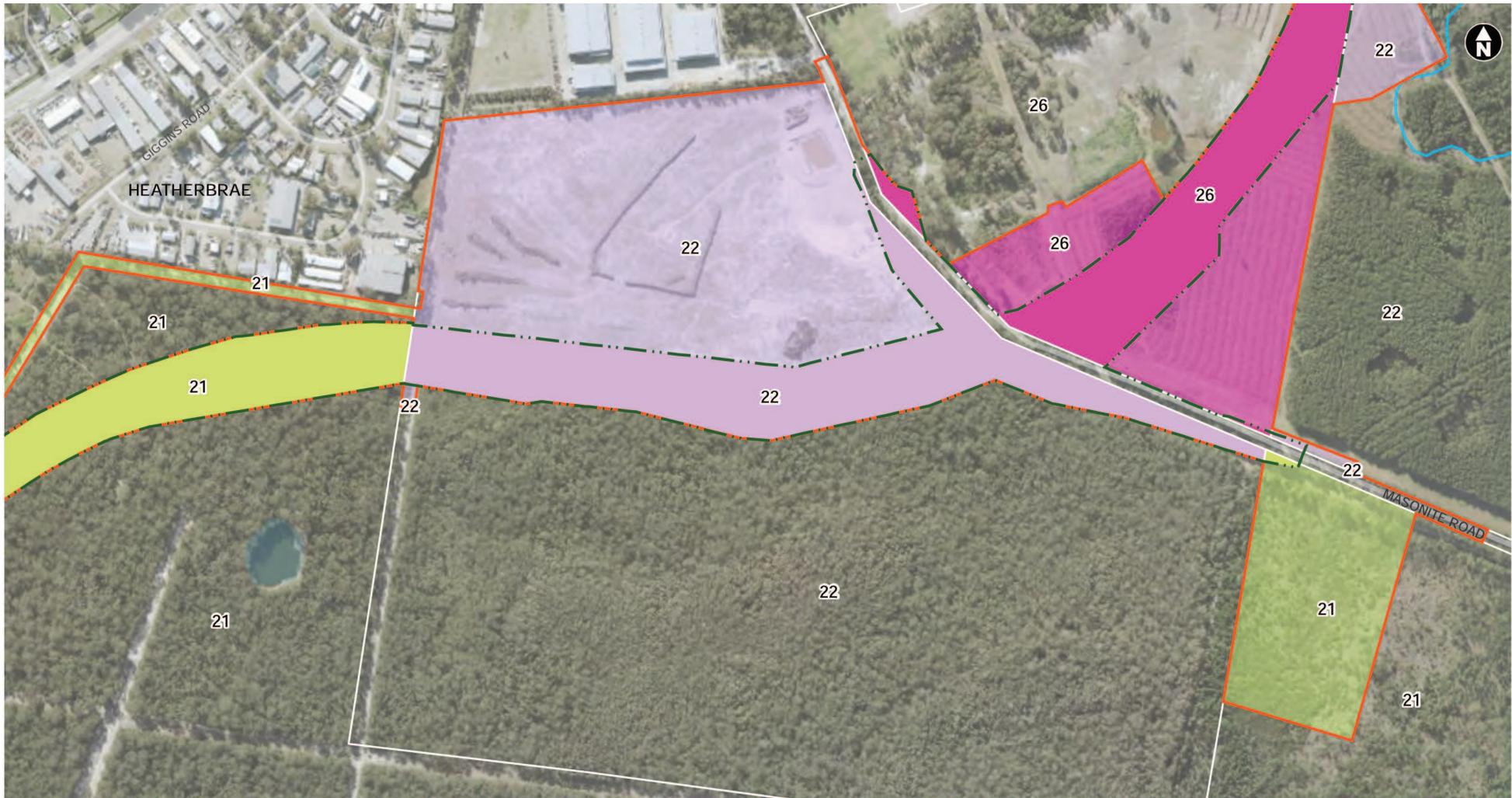


Page 6 of 8



Figure 5-1 Properties to be acquired or leased (map 6 of 8)

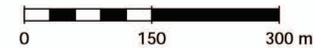
Date: 23/10/2020 Path: J:\E\Projects\04_Eastern\A23000022_Spatial\GIS\Directory\Templates\Figures\EIS\3_TechnicalReports\Land_Use\A230000_CD_LU_009_PropertiesImpacted_JAC_A4L_8250_V04.mxd



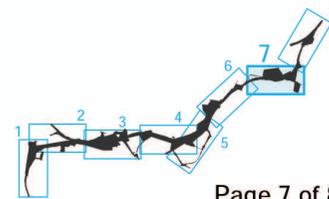
Construction footprint
 Operational footprint

Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 7 of 8

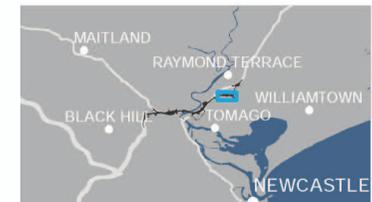
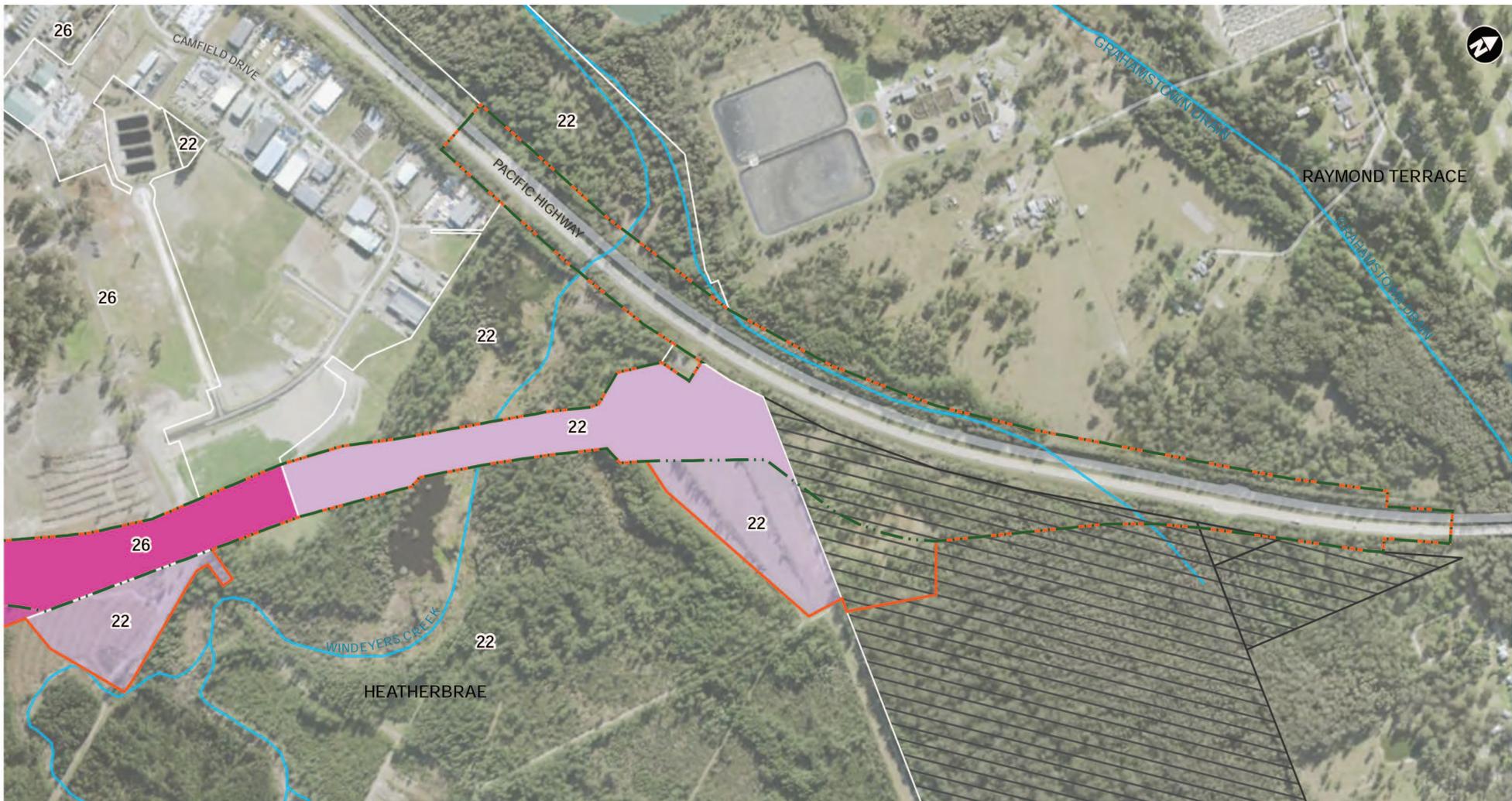


Figure 5-1 Properties to be acquired or leased (map 7 of 8)

Date: 23/10/2020 Path: J:\EIP\Projects\04_Eastern\A23000022_Spatial\GIS\Directory\Templates\Figures\EIS\3_TechnicalReports\Land_Use\A230000_CD_LU_009_PropertiesImpacted_JAC_A41_8250_V04.mxd

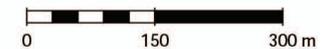


Construction footprint
 Operational footprint

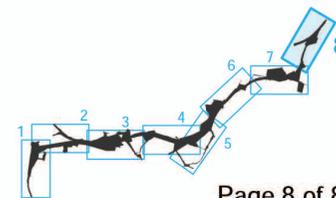
Properties impacted by acquisition or leasing have a unique property ID number and may include more than one lot

Project land owned by Transport

Waterways



Note: Sections of the properties that are impacted by acquisition are shown in unique full colour and sections of the properties impacted by lease arrangements are shown in the same colour at 30% transparency.



Page 8 of 8

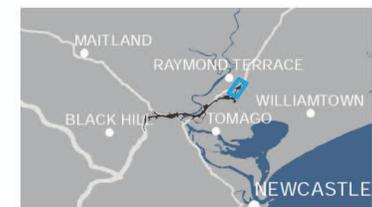


Figure 5-1 Properties to be acquired or leased (map 8 of 8)

Date: 23/10/2020 Path: J:\E\Project\04_Eastern\A230000\22_Spatial\GIS\Directory\Templates\Figures\ESI\3_TechnicalReports\Land_Use\A230000_CD_LU_009_PropertiesImpacted_JAC_A4L_8250_V04.mxd

5.1.3 Other property impacts

Construction and operation of the project has potential to cause impacts on properties near to the project due to changes in access, local flooding and amenity.

Changes to property access

During construction, access to properties near to construction work would be maintained although temporary changes may be required for some properties at Black Hill, Tarro, Tomago, Heatherbrae and Raymond Terrace. Once complete, the project would be classified as a motorway owned by Transport with no direct access from surrounding properties in accordance with the provisions of the *Roads Act 1993*.

Properties that are likely to experience access changes during construction and operation are outlined in **Table 5-2** and include privately owned properties and properties owned by utility providers, local council and NSW Government agencies. During construction, suitable access arrangements for affected properties would be implemented in consultation with affected property owners and tenants. Where existing property accesses would be permanently affected by the project, access would be provided either from existing roads or new access provided as part of the project (refer to Traffic and Transport Working Paper (Appendix G of the EIS)).

Potential impacts on access and connectivity for residents, workers and visitors is discussed in the Socio-economic Working Paper (Appendix M of the EIS).

Table 5-2 Properties with access changes during construction and operation

| Location | Lot/DP | Ownership | Project phase |
|------------|---|---|----------------------------|
| Black Hill | 122/DP1235373 | City of Newcastle | Construction and operation |
| | 10/DP1186448 | City of Newcastle | Construction |
| | 1617/DP1153099, 102/DP846451 | Hunter Water Corporation | Construction and operation |
| | 50/DP879741, 14/DP1186448 | Transport for NSW (TransGrid infrastructure) | Construction and operation |
| Tarro | 2/DP873320 | Private owner | Construction and operation |
| | 4/DP735235 | Private owner | Construction |
| | 103/DP1084709 | Private owner | Construction |
| | 52/DP551256 | City of Newcastle | Construction |
| | 10/DP735235, 2/DP735456, 104/DP1084709 | Aurizon Operations Limited | Construction and operation |
| | 100/DP1044020 | Private owner | Construction |
| | 1/DP128309 | Hunter Water Corporation | Construction and operation |
| Hexham | 1/DP1165954 | Private owner | Construction |

| Location | Lot/DP | Ownership | Project phase |
|--|--|--|----------------------------|
| Tomago | 2/DP1043561, 3/DP1043561, 4/DP1043561 | AGL Macquarie | Construction and operation |
| | 51/DP739336, 202/DP1173564 | Transport for NSW (TransGrid infrastructure) | Construction and operation |
| | 1/DP748716 | Hunter Water Corporation (Hunter Region Botanic Gardens) | Construction and operation |
| | 102/DP1038663 | Private owner | Construction |
| | 43/DP558481 | Private owner | Construction |
| | 2/DP1173564 | Tomago Aluminium | Construction |
| | 1203/DP1229590 | AGL Energy | Construction |
| Heatherbrae | Lot 430/DP833938 | Private owner | Construction |
| | B/DP163470 | Private owner | Construction |
| Tomago / Heatherbrae / Raymond Terrace | 1/DP748716, 2/DP748716, 18/DP1082495, 2/DP450444 | Hunter Water Corporation | Construction and operation |
| | 211/DP1103169 | Hunter Water Corporation | Construction |
| Raymond Terrace | 905/DP1256183, 906/DP1256183 | Weathertex | Construction and operation |
| | 34/DP1041438 | Hunter Water Corporation | Construction and operation |

Property infrastructure and dwellings

Permanent adjustments would be required to some private properties for the project, including adjustments to fencing and other infrastructure such as signage, due to partial property acquisition. Any adjustments to properties required for the project would be carried out in consultation with the property owner. Further discussion about potential impacts on rural uses is discussed in **Section 5.2.1**.

The project would directly impact three dwellings, including two dwellings on rural land and one dwelling associated with a commercial property at Heatherbrae. One dwelling is within the site of the proposed power station, which is due to be operational prior to construction of the project. If the proposed power station proceeds within the timeframe expected, it is assumed that this dwelling would be removed as part of the proposed power station development. Should this occur, only two dwellings would be directly impacted by the project. Residents of these dwellings would be required to relocate prior to the commencement of construction.

An additional dwelling is located within the construction footprint at Tarro, next to ancillary facility (AS5). While this dwelling would not be directly impacted by the project, the residents of this property may be required to temporarily relocate during the construction phase.

Flooding

The project has potential to change flooding impacts for surrounding properties. During construction, raised construction access tracks around the viaduct, viaduct piers, wharf structures and permanent road embankments have potential to cause increase flood levels and potential flood hazard and duration of inundation. This would affect 19 lots and five habitable buildings. During operation, a total of 10 lots and one habitable building would experience afflux exceeding the adopted criteria during operation.

The majority of existing flood-affected residential, commercial and industrial properties currently would experience at most, a negligible change in flood depth (that is, a 0.01 metre change), flood hazards or duration of inundation (defined as a change up to three hours) during operation. The project would result in localised increases in flow velocities, flood hazards and duration of inundation, although potential impacts of these changes are generally expected to be negligible.

The project is expected to have negligible to minor flooding impacts on agricultural and grazing activities, emergency services (including evacuation routes) and future development potential of affected land, existing roads and rail infrastructure. Further discussion about potential flood impacts is provided in the Hydrology and Flooding Working Paper (Appendix J of the EIS).

Local amenity

Potential impacts may occur for properties near the project due to changes in local amenity related to visual impacts, increased traffic noise and changes to air quality. Further discussion about potential amenity impacts for communities near the project from construction and operation are discussed in the Socio-economic Working Paper (Appendix M of the EIS), with further information also provided in the Urban Design, Landscape Character and Visual Amenity Working Paper (Appendix O of the EIS), Noise and Vibration Working Paper (Appendix H of the EIS), and Air Quality Working Paper (Appendix R of the EIS).

5.1.4 Residual land

Partial acquisition of land has the potential to result in severance or fragmentation of some rural properties, particularly larger land holdings.

As indicated in **Section 5.1.2**, the project has been designed to minimise the potential for partial acquisition of land to result in severance or fragmentation of rural properties. Transport would continue to consult with property owners through the detailed design should this change. Total acquisition offers may be triggered in instances where:

- Residual land is not developable
- Transport is unable to provide access to the residual land
- The project directly impacts and requires removal of the main residence on the property
- Transport receives a request from the property owner.

5.2 Impacts on existing land uses

Potential impacts on existing land use from construction and operation of the project would mainly relate to:

- Direct impacts on land use, including temporary impacts from the placement of ancillary construction facilities and permanent impacts from the siting of the project
- Changes in amenity for some land uses along the existing Pacific Highway or near to the project, associated with noise and dust from construction activities and construction traffic, and changes in road traffic noise during operation
- Changes to property access, including temporary changes near to construction work and permanent changes due to the siting of the project.

Potential impacts on amenity and property access for land uses near the project are described in the Socio-economic Working Paper (Appendix M of the EIS).

The construction footprint for the project would directly impact about 465.6 hectares of land, of which about 300 hectares would be permanently impacted by the operational footprint (refer **Appendix A**).

Currently, about 94 hectares of land within the construction footprint and 79 hectares of land within the operational footprint comprises existing transport and communication uses, the majority of which is existing road corridors (based on NSW Government Land Use Data). Other land uses within the construction and operational footprint include conservation and environmental uses, primary production, manufacturing and industrial uses, residential uses, service related uses, utilities, and water resources uses.

Permanent land use change would occur to land within the operational footprint, with about 216 hectares of existing land uses changing to transport infrastructure. This would increase the footprint of transport infrastructure within the study area from about 237 hectares to about 453 hectares, representing about 8.3 per cent of the study area¹.

As indicated in **Section 5.1.2**, use of, and access to, land within the construction footprint would be disrupted during the construction period. Following construction, these areas subject to temporary lease would be reinstated to pre-construction use or as agreed with the property owner.

Overall, direct impacts on land use from the construction and operation of the project are expected to be low given the project mainly passes within or near to existing road corridors or through rural areas used for grazing. While the project would result in a permanent change in land use to transport infrastructure, most of the affected land uses represent a relatively small proportion of these land uses within the wider City of Newcastle and Port Stephens Council LGAs and are not expected to impact on the overall availability of these uses.

5.2.1 Primary production

Land used for primary production uses comprises about 219 hectares of land within the construction footprint, the majority of which comprises land used for grazing (about 178 hectares). This represents about 12 per cent of primary production land uses in the study area and about 1.0 per cent in the combined LGAs. In relation to other primary production uses, the construction footprint would impact on land identified for plantation forest at Heatherbrae, although while mapped as forestry production, most of the affected land is identified for future industrial uses. The construction and operation footprint would not impact on any land used for horticulture or cropping.

About 121 hectares of primary production land would be permanently impacted and changed to transport infrastructure. This mainly includes grazing land at Beresfield, Black Hill and Tarro. While this represents about 6.5 per cent of total primary production land in the study area and a very small proportion of these land uses in the City of Newcastle and Port Stephens Council LGAs (0.5 per cent). Following construction, land not required for the ongoing operation of the project would be reinstated to its original use or as agreed with affected property owners. Rehabilitation of rural land subject to temporary lease would be carried out in accordance with relevant guidelines to minimise the potential for ongoing risks to rural land uses.

Other impacts on primary production uses

The Biodiversity Assessment Report (Appendix I of the EIS) identified the presence of a number of weed species in the construction footprint. During construction there would be potential for the spread of weeds to occur between properties potentially resulting in biosecurity risks and impacting on rural land uses at Black Hill, Beresfield, Tarro, Woodberry, Tomago and Heatherbrae.

The potential for biosecurity risks from the movement of weeds would potentially be highest where construction vehicles and machinery cross multiple rural properties or where new access tracks are

¹ Note, transport land uses in the study area are classified as 'transport and communications' by NSW Government Land Use data, defined as including airports or aerodromes, roads, railways, ports and water transport, navigation and communication.

created. New construction access tracks may also encourage pest animals such as foxes and cats. The implementation of appropriate management measures in accordance with the *Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects* (RTA, 2011) and land access protocols (for example, limiting vehicle and people movements on rural properties and cleaning of vehicles and machinery) will be important in minimising potential impacts on rural land and farming operations.

Further information on the presence of pests and disease or weeds, and associated management measures in accordance with the 'general biosecurity duty' under the *Biosecurity Act 2015* is provided in the Biodiversity Assessment Report (Appendix I of the EIS). Changes to flooding from the construction and operation of the project have the potential to impact on agricultural and grazing activities at Beresfield, Tarro and Woodberry, due to increased flood extents and durations of inundation affecting productivity of land and impacts to stock flood refuge access on the floodplain. Overall, any flooding impacts are expected to be negligible to minor compared to the existing case flood effects. Further information about potential impacts of flooding on agricultural and grazing activities is in the Hydrology and Flooding Working Paper (Appendix J of the EIS).

5.2.2 Intensive uses

Residential

About six hectares of land within construction footprint comprises land used for residential uses. In the longer term, about three hectares would be permanently impacted by the operational footprint, representing a very small proportion (that is, less than one per cent) of this land use in the study area. The affected land mainly comprises residential uses on farming land and vacant land next to residential uses at Beresfield.

The project would not impact on the availability of land for residential uses in the study area or wider LGAs. Once operational, the project would provide improved access and connectivity for existing and future residential uses in areas such as Black Hill, Beresfield and Raymond Terrace.

Potential impacts associated with the acquisition of residential uses and changes to amenity of residential uses near the project are described in the Socio-economic Working Paper (Appendix M of the EIS).

Manufacturing and industrial

Manufacturing and industrial land directly impacted by the construction and operational footprints is about seven hectares, mainly confined to vacant land between the Hunter River and Pacific Highway at Tomago. This represents less than two per cent of land mapped for these land uses in the study area and a very small proportion of these uses (less than half a per cent) in the wider LGAs.

In addition to the indicative ancillary facilities identified within the construction footprint, opportunities to use suitable existing sites in the surrounding industrial areas in Black Hill, Beresfield, Hexham, Tomago and Raymond Terrace would be investigated to reduce the construction footprint. Potential sites could be used for a range of functions and activities, for example stockpiling and laydown of materials and equipment, crushing and materials processing, concrete batch plants and worker parking. Further details of possible uses are provided in Chapter 5 of the EIS.

The project's construction and operational footprints are not expected to impact on the availability of land for manufacturing, industrial and services uses within the study area or wider LGAs, including at Beresfield, Tomago and Heatherbrae. The use of suitable sites within existing industrial areas is also not expected to impact on the availability of land for manufacturing, industrial and services uses. Once operational, the project would support improved access to the M1 Pacific Motorway and Pacific Highway for manufacturing, industrial and services uses at Beresfield and Tomago. Further discussion about potential impacts for local

business and industry from the construction and operation of the project is provided in the Socio-economic Working Paper (Appendix M of the EIS).

Services

About 14 hectares of land used for service related uses such as commercial and public services would be impacted by the construction footprint including commercial land uses at Heatherbrae, land within the Hunter Regional Botanic Gardens, and land within one property at the Tomago industrial estate. This represents about three per cent of this land use type in the study area and a very small proportion of this land use type in the City of Newcastle and Port Stephens Council LGAs. Once operational, the project would result in the permanent land use change of about nine hectares of land used for service related uses to transport uses.

Infrastructure

As previously indicated, about 94 hectares of land within the construction footprint and 79 hectares of land within the operational footprint comprises existing transport and communication uses, the majority of which is existing road corridors. The construction footprint would directly impact an additional four hectares of land used for infrastructure, mainly comprising land within utilities corridors for power, water and gas pipelines. The affected utilities would need to be relocated, adjusted or protected where they may be affected by project construction. Further discussion about potential impacts on utilities infrastructure is provided in **Section 5.5**.

Other intensive uses

The project would not impact on any land used for mining related uses. About nine hectares of land used for intensive animal production would be impacted by the construction footprint. The project would require permanent land use change to about one hectare of intensive animal production land. The affected land is mainly within one property used for a horse stud at Heatherbrae, that provides training and agistment for racehorses (refer to **Table 5-1** for further details). Construction and operation of the project would impact on a section of the training track and associated railings and fencing within the affected property, requiring modifications to the training track and adjustments to the fencing and railings. As indicated in **Section 5.1.3**, any modifications or adjustments required for the project would be carried out in consultation with the property owner. The project is not expected to impact on this land use type within the study area as a whole. Potential impacts of the project on the operation and functioning of the horse stud are described in the Socio-economic Working Paper (Appendix M of the EIS).

5.2.3 Conservation and natural environments

About 91 hectares of land within the construction footprint comprises nature conservation, managed resources (for example, biodiversity areas, surface and ground water supplies) and other minimal uses such as residual native cover. Combined, this represents about 6.0 per cent of these land uses in the study area. Most of the land affected by the construction footprint comprises managed resource protection (about 58.5 hectares), with this mainly being Hunter Water Corporation land at Tomago and Heatherbrae.

The project would require clearing within these areas for the road corridor and establishment of ancillary construction sites. Following construction, conservation and natural environment land uses within the construction footprint that are not required for the ongoing operation of the project, would be rehabilitated and reinstated as agreed with the property owner. About 62 hectares of conservation and natural environment land uses would be permanently impacted by the project, most of which comprises land used for managed resource protection.

As indicated in **Section 4.3.3**, the construction footprint overlaps with a small portion of an existing BioBank Agreement on land owned by Hunter Water Corporation. Although the construction footprint has sought to avoid and minimise direct impact where possible, it includes the western edge of the BioBank site south of the botanic gardens. The area of impact to the BioBank site is around 0.6 hectares along the western boundary of the conservation agreement and includes minor impacts to native vegetation. Further discussion about potential impacts on ecological and biodiversity values is provided in the Biodiversity Assessment Report (Appendix I of the EIS).

5.2.4 Water

About 22 hectares of land comprising water uses such as rivers and wetlands would be directly impacted by the construction footprint (representing about five per cent of these uses in the study area). About half of this comprises land within the Hunter River, with other areas of affected land comprising marsh / wetland areas next to the Hunter River at Tomago, water pipeline easements at Black Hill and creeks at Tarro. Potential impacts on the water infrastructure easement is provided in **Section 5.5**.

Once operational, the project would result in the permanent land use change of about 10 hectares of land comprising water uses (excluding the Hunter River), of which nearly nine hectares would comprise marsh / wetland areas.

Further discussion about potential impacts on ecological and biodiversity values within the Hunter River and marsh / wetland areas is provided in the Biodiversity Assessment Report (Appendix I of the EIS).

Access would be maintained to the Hunter River for recreational and commercial uses, although temporary disruptions would occur during construction due to access restrictions near to construction work. Further discussion about potential impacts on recreational and commercial users is provided in the Socio-economic Working Paper (Appendix M of the EIS).

The Hunter Valley Flood Mitigation Scheme includes levee banks and other drainage controls that are near to the project. The scheme provides flood protection to people, property and infrastructure across the Hunter floodplain. The project would impact on the Hunter Valley Flood Mitigation Scheme due to access roads that would be constructed immediately next to the existing flood levees on the western Hunter River floodplain. While these roads may modify the structure and maintenance of the levees, they are not expected to impact on operation, function or structural integrity of the Scheme, including floodgates. Transport will continue to consult with the operators of the Scheme during detailed design to minimise impacts on the Scheme.

5.3 Land use zoning

As indicated in **Section 4.4**, a road corridor for the project was gazetted in the Newcastle LEP and Port Stephens LEP.

About 173 hectares of the project's construction footprint (37 per cent) and about 157 hectares of the project's operational footprint (52 per cent) would directly impact land zoned SP2 (Infrastructure), including land within the gazetted road corridor and existing road corridors. The remaining area of land affected by the construction and operation of the project is zoned for a range of commercial, environmental, industry, residential, rural and recreation uses.

Following construction, land within the construction footprint that is outside of the operational footprint would generally be available for development in accordance with the objectives of the various land use zones.

Table 5-3 provides a summary of impacts on land zoning in the study area from the project's construction and operation. Land zones shaded grey are in the construction and operational footprints. Further information on affected land use zones is in **Appendix B**.

Table 5-3 Impact on land zoning in the study area

| Land use zone | Impact on land use zoning |
|---------------------------------------|--|
| B1 Neighbourhood centre | The construction and operational footprints for the project would not directly impact on land in this zone. Impacts on land uses within this zone are also not expected from the construction or operation of the project. |
| B2 Local centre | The construction and operational footprints for the project would not directly impact on land in this zone. Impacts on land uses within this zone are also not expected from the construction or operation of the project. |
| B5 Business development | The construction and operational footprints for the project would directly impact about 1.6 hectares of land zoned Business Development at Heatherbrae. This represents a relatively small proportion of this zoning type in the study area and combined LGAs and would not impact on the availability of land zoned for Business Development within the study area or Port Stephens Council and City of Newcastle LGAs. |
| E1 National parks and nature reserves | The construction and operational footprints for the project would not directly impact on land in this zone. Further discussion about potential impacts on ecological and biodiversity values is provided in the Biodiversity Assessment Report (Appendix I of the EIS). |
| E2 Environmental conservation | <p>The construction footprint would directly impact about 103 hectares of land zoned E2 (Environmental conservation) within the Hunter River floodplain at Black Hill, Tarro and Tomago. This land would be required for the construction of road infrastructure for the project and construction ancillary facilities (AS5, AS10 and AS11). Following construction, about 61 hectares of land zoned E2 would be permanently impacted by the project, with the remaining land rehabilitated to its current use. This represents about five per cent of this land use zone in the study area and less than one per cent in the combined LGAs.</p> <p>Much of the land within this zone affected by the project's construction and operation corridors comprises previously cleared land that is currently used for grazing. The exception to this is an area of wetland at Tomago next to the Hunter River. The project would require the removal of some native vegetation, including areas of Commonwealth and State listed vegetation next to the Hunter River and would also intensify development in some parts of the Hunter River floodplain.</p> <p>Further discussion about potential impacts on ecological and biodiversity values is provided in the Biodiversity Assessment Report (Appendix I of the EIS).</p> |
| E3 Environmental management | The construction footprint would directly impact about 0.1 hectares of land zoned E3 (Environmental management) at Tarro, representing a very small proportion of this zoning type in the study area and combined LGAs. This would be for construction of the upgraded intersection at Anderson Drive and there would be no permanent impacts on land in this zone. This work would mainly occur within the road corridor and would not impact on the intent of this zone. |
| E4 Environmental living | <p>The construction footprint would directly impact about 57 hectares of land zoned E4 (Environmental living) at Black Hill. This represents about 12.5 per cent of this zoning type in the study area and about four per cent in the combined LGAs.</p> <p>This land would be for the construction of road infrastructure and construction ancillary facilities (AS1, AS2, AS3). Construction of the project would require the clearing of areas of native vegetation within this zone. Following construction, about 43 hectares of E4 zoned land would be permanently impacted, with the remaining land rehabilitated to its current use. This represents about nine per cent of land zoned E4 in the study area and about three per cent within the combined LGAs. The affected land mainly comprises areas of existing vegetation near the existing road and infrastructure corridors.</p> <p>Once operational, the introduction of a new motorway corridor is likely to impact on amenity for some parts of the study area zoned for environmental living, potentially reducing the area of land used for future environmental living uses. Further discussion about potential amenity impacts for residential uses near the project are described in the Socio-economic Working Paper (Appendix M of the EIS).</p> |

| Land use zone | Impact on land use zoning |
|-------------------------------|--|
| IN1 General industrial | <p>The construction footprint would directly impact on about 58 hectares of land zoned for general industry (IN1) at Tomago and Heatherbrae. This represents about 7.0 per cent of this zoning in the study area and about 4.1 per cent in the combined LGAs. This land would be for the construction of road infrastructure and construction ancillary facility (AS12, AS13, AS16, AS18, AS19).</p> <p>Once operational, about 18.0 hectares of land zoned IN1 would be permanently impacted by the project. This represents about two per cent of this zoning type in the study area and one per cent within the combined LGAs and would not impact on land zoned for these land uses in the study area or wider LGAs.</p> <p>Following construction, land zoned for general industry not required for the ongoing operation of the project would be rehabilitated and would be available for development in accordance with the objectives of the zone.</p> |
| IN2 Light industrial | <p>The construction and operational footprints would not directly impact on land within the study area zoned for IN2 (Light industrial). Operation of the project would support land zoned for light industrial uses at Tomago and Heatherbrae zoned by providing improved access to the M1 Pacific Motorway, including for workers, customers and freight.</p> |
| IN3 Heavy industrial | <p>The construction and operational footprints would not directly impact on land within the study area at Hexham zoned for IN3 (Heavy industrial).</p> |
| R2 Low density residential | <p>The construction footprint would directly impact about 0.5 hectares of land zoned for low density residential (R2) at Tarro. This would be for construction of the upgraded intersection at Anderson Drive and there would be no permanent impacts on land in this zone. This work would mainly occur within the road corridor and would not impact on the intent of this zone.</p> <p>Operation of the project would support land zoned for residential uses at Tarro and Raymond Terrace by providing improved access to the M1 Pacific Motorway. Operation of the project would also impact positively on current and future residential land uses in this zone at Heatherbrae through the reduction in through traffic using the Pacific Highway in Heatherbrae, including heavy vehicles, and subsequent reductions in traffic noise.</p> |
| R3 Medium density residential | <p>The construction and operational footprints for the project would not directly impact on land in this zone. Impacts on land uses within this zone are also not expected from the construction or operation of the project.</p> |
| R5 Large lot residential | <p>The construction and operational footprints for the project would not directly impact on land within the study area at Heatherbrae zoned R5 (Large lot residential). Construction and operation of the project would not impact on the objectives of this zone. Operation of the project would impact positively on current and future residential land uses in the zone through the reduction in through traffic using the Pacific Highway in Heatherbrae, including heavy vehicles, and subsequent reductions in traffic noise.</p> |
| RE1 Public recreation | <p>The construction footprint would directly impact about 0.3 hectares of land zoned for public recreation (RE1) at Beresfield. This represents a very small proportion of this land use zoning in the study area and combined LGAs and would not impact on the availability of land zoned for these uses in the study area or wider LGAs. This land would not be required for operation of the project and following construction, would be reinstated to its current use. The affected land includes the landscape buffer for the Pasadena Crescent Reserve Soccer Fields and the use of this land would not impact on the objectives of this zone.</p> |
| RE2 Private recreation | <p>The construction and operational footprints for the project would not directly impact on land within the study area zoned RE2 (Private recreation). Construction and operation of the project would not impact on the objectives of this zone.</p> |
| RU1 Primary production | <p>The construction and operational footprints for the project would not directly impact on land in this zone. Construction and operation of the project would not impact on the objectives of this zone, particularly those relating to land use conflicts or fragmentation or alienation of resource lands.</p> |

| Land use zone | Impact on land use zoning |
|---------------------------|--|
| RU2 Rural landscape | <p>The construction footprint would directly impact about 50 hectares of land zoned RU2 (Rural landscape) at Tomago and Heatherbrae. This represents about 6.0 per cent of this zoning type in the study area and about 0.2 per cent in the combined LGAs. During construction land would be used for the construction of road infrastructure and ancillary construction facility (AS11).</p> <p>Following construction, about 12 hectares of RU2 zoned land would be permanently impacted, with the remaining land rehabilitated to its current use. This represents about 1.5 per cent of this zoning type in the study area and about 0.1 per cent within the combined LGAs.</p> <p>Land within this zone that is either temporarily or permanently impacted by the project is located next to the existing Pacific Highway and the use of this land for construction and operation would not be expected to impact on the objectives or intent of this zone.</p> |
| SP1 Special activities | <p>The construction footprint would directly impact about 15 hectares of land zoned SP1 (Special activities). This includes land at Tomago used for the protection of water catchment areas and the provision of Hunter Water Corporation. Following construction, about 5.5 hectares of land zoned SP1 would be permanently impacted by the project.</p> <p>Land within the zone that is either temporarily or permanently impacted by the project is generally located next to the existing Pacific Highway, although an area zoned SP1 at Masonite Road would also be temporarily used for ancillary construction facility (AS17).</p> <p>Use of land within the land use zone is not expected to impact on the objectives or overall intent of this zone either in the short-term or longer-term.</p> |
| W1 Natural waterways | <p>The construction and operational footprints for the project would not directly impact on land in this zone. Further discussion about potential impacts on aquatic ecological values is provided in the Biodiversity Assessment Report (Appendix I of the EIS).</p> |
| W2 Recreational waterways | <p>The construction footprint would directly impact about 7.5 hectares of land within the Hunter River zoned W2 (Recreational waterways). This would be for the construction of the bridge across the Hunter River. During construction, temporary impacts would occur on the use of this river for water-based recreation and fishing uses due to access restrictions and implementation of exclusion zones. These impacts are discussed in the Socio-economic Working Paper (Appendix M of the EIS).</p> <p>Once operational, the project would be in bridge structure and would not impact on this zoning.</p> |

Note: Land use zones shaded grey are in the construction or operational footprints.

5.4 Mining

As indicated in **Section 4.4**, a mining lease and exploration licence are located within or near to the study area at Black Hill. The construction or operational footprints would not directly impact the area covered by the mining lease (ML1618) with the boundary for the mining lease located west of the M1 Pacific Motorway and southwest of Beresfield. As indicated in **Section 4.4**, this mining operation is currently in care and maintenance mode and impacts from the project are not expected. Consultation with Donaldson Coal was carried out in 2016 to advise of potential mining impacts.

The project construction and operational footprints are covered by an exploration licence (EL5497) and an assessment lease (ALA71). The boundaries for this licence and assessment lease extends to the western side of the M1 Pacific Motorway at Black Hill. Work in this area are generally located within or near to the existing M1 Pacific Motorway corridor and potential impacts on any future mining uses are expected to be minimal. Access to the exploration licence and assessment lease areas would not be permitted from the M1 Pacific Motorway, however access to these areas would be available via Lenaghans Drive and John Renshaw Drive should future exploration activities be investigated.

Potential risks associated with the Black Hill Mine Subsidence District are described in Chapter 22 of the EIS (safety and risk).

5.5 Utilities

The project would affect some utilities and services, including electricity transmission lines, telecommunications infrastructure, and water and gas pipelines.

In general, utilities would need to be relocated, adjusted or protected where they may be affected by project construction, particularly in areas where ground disturbance is required. This work would be carried out in consultation with the relevant service provider to minimise any service disruptions.

Depending on the utility service being relocated, work may be required to occur outside the construction footprint to meet requirements of the utility service provider. Changes to utilities that are located outside the construction footprint would be subject to separate environmental assessment.

Potential utility relocation, adjustments or protections are summarised in **Table 5-4**. Further work would be carried out during detailed design to confirm the exact impact on utilities and any permanent relocations that would be required. The location of existing utility services and any changes required would be confirmed by the construction contractor during the detailed design in consultation with the relevant utility provider.

Operation of the project is not expected to impact on infrastructure and utilities in the study area.

Table 5-4 Summary of utility impacts

| Location | Asset owner | Asset type | Summary of impact and protection strategy |
|--|-------------|---|---|
| <ul style="list-style-type: none"> Black Hill interchange Across the floodplain west of the Hunter River Tomago interchange | TransGrid | Major overhead high voltage transmission lines | <p>A minimum overhead clearance of 12m is required. The project would achieve this at Black Hill and Tomago, although is unable to achieve the minimum vertical clearance across the floodplain, west of the Hunter River. The overhead lines would be lifted in this location via the installation of a mid-span suspension structure to achieve the minimum clearance over the main alignment.</p> <p>A minimum horizontal clearance of 20m is required for transmission tower structures. This is achieved at the Tomago interchange. Minor embankments would encroach on the clearance at Black Hill. Transport will continue to consult with TransGrid regarding this issue.</p> |
| Pacific Highway between Tomago Road and Heatherbrae | Ausgrid | Overhead and underground high and low voltage lines | High voltage overhead and underground low voltage lines near the Tomago interchange would be impacted by the project. These lines would be relocated adjacent to the realigned Pacific Highway and main alignment. |
| Black Hill between Weakleys Drive and Lenaghans Drive | Ausgrid | Overhead high voltage line | The high voltage overhead lines located parallel to the M1 Pacific Motorway between Weakleys Drive and Lenaghans Drive would be impacted by the project. These lines would be relocated adjacent to the project. |
| Black Hill, south of Weakleys Drive | Ausgrid | Overhead transmission and high voltage lines | The concrete pole supporting the overhead transmission and high voltage lines from John Renshaw Drive, east and west of the M1 Pacific Motorway, may be impacted by widening required for the project. This pole may require relocation or protection in consultation with Ausgrid. |

| Location | Asset owner | Asset type | Summary of impact and protection strategy |
|--|--------------------------|---|--|
| Beresfield / Tarro between John Renshaw Drive and Anderson Drive | Ausgrid | Overhead transmission lines | The overhead transmission lines located parallel to the New England Highway between John Renshaw Drive and Woodlands Close would be impacted by the widening and realignment of the New England Highway. These lines would be relocated adjacent to the project main alignment in consultation with Ausgrid. The overhead lines that cross the New England Highway east of John Renshaw Drive and connect to Christie Road may also require minor adjustments. |
| Woodlands Close, Tarro | Ausgrid | Overhead high voltage transmission lines | The overhead lines located parallel to Woodlands Close would be impacted by Bridge B05. These lines would be relocated adjacent to Woodlands Close. |
| Heatherbrae, near Jura Street | Ausgrid | Underground and overhead high voltage lines | High voltage overhead and underground lines that intersect the project near Jura Street, Tomago. Minor adjustments to the overhead and underground lines would be required in consultation with Ausgrid. |
| Masonite Road, Heatherbrae | Ausgrid | Overhead high voltage transmission lines | The overhead lines located adjacent to Masonite Road would be impacted by the realignment of Masonite Road. These lines would be relocated adjacent to the realigned Masonite Road in consultation with Ausgrid. Additional minor adjustments may be required where the lines cross the main alignment north-east of Masonite Road. |
| Heatherbrae, near Camfield Drive | Ausgrid | Overhead transmission lines and potential All-Dielectric Self-Supporting (ADSS) Fibre Optic | The overhead transmission lines and potential ADSS Fibre Optic cross the project alignment near Camfield Drive and would require minor adjustments to ensure that adequate clearances are maintained. |
| Pacific Highway, north of Masonite Road, Raymond Terrace | Ausgrid | Overhead high voltage and low voltage lines | The overhead electrical lines located at the Pacific Highway would be impacted by the project. A section of these lines would be relocated adjacent to the project in consultation with Ausgrid. |
| Tarro interchange | Hunter Water Corporation | Proposed Chichester Trunk Gravity Main (CTGM) | A substantial length of the gravity main would be beneath the project at Tarro. The CTGM would need to be either protected or relocated by the project in consultation with Hunter Water Corporation. |
| <ul style="list-style-type: none"> • Black Hill • Tomago • Heatherbrae • Raymond Terrace | Hunter Water Corporation | Water mains and sewer mains | A number of water and sewer mains would be impacted by the project. These assets will be further considered during detailed design and protected or relocated depending on their accurate location and depth. |

| Location | Asset owner | Asset type | Summary of impact and protection strategy |
|--|-----------------------------|--|---|
| Multiple locations within project footprint | Telstra, Nextgen, and Optus | Optical fibre and copper network | <p>Numerous major and minor aerial and underground cables are located along and through the project and would be impacted by the project at various locations.</p> <p>These cables are typically located within existing road corridors. Locations where telecommunications utilities would be impacted and require either protection and/or relocation include:</p> <ul style="list-style-type: none"> • The main alignment, Lenaghans Drive, Weakleys Drive and John Renshaw Drive at Black Hill • The New England Highway at Beresfield and Tarro • Woodlands Close at Tarro • Tomago Road and Old Punt Road at Tomago • The Pacific Highway at Tomago, Heatherbrae and Raymond Terrace • Masonite Road at Heatherbrae. <p>Further survey to accurately locate these cables will be carried out during detailed design to determine the need for protection and/or relocation.</p> |
| Tomago | AGL | High pressure gas main and proposed plant site | The Tomago to Hexham gas pipeline would be in the vicinity of the project and may require protection and relocation. In addition, a gas-fired power station is proposed at Tomago between the Pacific Highway and Old Punt Road, near ancillary facility AS12. The proposed power station would be in the vicinity of the main alignment, and an easement for the gas pipeline would be impacted by the project. |
| Pacific Highway between Tomago and Heatherbrae | Jemena | Gas main | Gas mains are in the vicinity of the project and would be relocated to avoid potential impacts. |
| Old Punt Road, Tomago | AGL | Gas main | A gas main is located in the vicinity of the project at Old Punt Road and may require protection or relocation to avoid impacts. |

5.6 Water users

As indicated in **Section 4.7**, five water access licences are registered within the study area that provide water for irrigation, industrial uses, drainage, dewatering and at the Hunter Region Botanic Gardens.

Construction and operation of the project has potential to impact on surface water and groundwater features within the study area, including waterways, wetlands and aquifers that have a high conservation or community value and that support ecosystems / human uses of water. During construction, potential impacts on groundwater would be associated with temporary groundwater dewatering and introduction or mobilisation of contaminants. It is expected that with the application of the standard and project specific management measures, potential impacts would be minor and manageable.

The project has potential to change stormwater discharges (for example, increased runoff due to vegetation clearance and paving of the new motorway, and changes to drainage paths), which may lead to changes to the flow regimes of the existing receiving environment. This may result in impacts to local receiving waterway processes and health immediately downstream of project discharge locations from storm events, including increased erosion and water turbidity, reduced bank stability and minor increases to the duration and depth of inundation for overbank events. Impacts to surface water quality and hydrology are further described in the Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS) and Hydrology and Flooding Working Paper (Appendix J of the EIS).

The project would be located on land within the Tomago Sandbeds Catchment Area. Potential impacts on the water quality of the Tomago Sandbeds Catchment Area during construction and operation of the project are expected to be appropriately managed with the implementation of management measures, including the lining of temporary construction sediment basins, permanent operational water quality basins and the swales leading to these basins located within the catchment area.

Refer to the Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS) for further detail on groundwater impacts. Details on water users such as recreational and commercial fishers, and oyster and aquaculture farmers are provided in the Socio-economic Working Paper (Appendix M of the EIS).

5.7 Future land use

Land within and surrounding the study area comprises several areas identified for future growth and development as part of the Hunter Regional Plan (DPE, 2016) and as important trading hubs by the Greater Newcastle Metropolitan Plan (DPE, 2018). Enhanced transport connections provided by the project's operation would have a positive impact on growth and development areas in the Hunter Region, supporting future employment uses within and surrounding the study area.

As indicated in **Section 4.1**, the M1 Pacific Motorway is a key north-south corridor linking Sydney to the Central Coast, Newcastle and Hunter region while the New England Highway and the Pacific Highway between the M1 Pacific Motorway at Black Hill and Raymond Terrace also form part of the National Land Transport Network. These roads facilitate significant regional and interstate freight movements.

The project is recognised in these strategies and would support future land use and development within the study area. In particular, improved access and connectivity provided by the project, such as improved safety outcomes and reduced travel times for motorists and freight vehicles, would support:

- Future employment and population growth at Raymond Terrace, which is identified as a strategic centre within the Hunter Region
- Growth and development of employment precincts at Tomago and Thornton, Beresfield and Black Hill
- Urban development within urban release areas such as at West Wallsend, Cameron Park and Edgeworth south of the study area.

Improved connectivity between strategic centres and growth areas is a key objective for future planning, supporting efficiencies in freight movements and future growth, and making it easier for people to get to work, recreation facilities and services.

The project would be an important part of the transport network allowing more efficient and safer access for residents, workers, businesses and freight in these locations, as well as the wider region.

Several industrial developments are proposed or planned within the study area at Black Hill, Beresfield and Heatherbrae, consistent with these strategies. In general, the project would support these developments by improving access and connectivity to the motorway network. Further information on these projects, including a discussion of potential cumulative impacts, is provided in **Chapter 6**.

5.8 Evaluation of potential land use conflict risks

An evaluation matrix presented in the LUCRA Guide was used to evaluate the significance of potential risks for existing land uses, associated with the construction and operation of the project. The outcomes of the land use conflict risk assessment are presented in **Appendix C**.

The assessment found that most land use conflict risks between the project and adjoining land uses would be effectively managed with the implementation of standard management measures and environmental safeguards.

The highest risk for residual land use conflicts would mainly be associated with impacts on other intensive land uses such as intensive animal production (for example, the horse stud at Heatherbrae). This received a risk score of 16 out of 25, with any potential consequences on these land uses expected to be minor.

The next highest risks for residual land use conflicts were generally considered to have negligible consequences, scoring a risk score of 11 out of 25. These related to:

- The permanent loss of primary production land
- Direct impact on residential dwellings
- Impacts on land used for commercial and public services, infrastructure and conservation and natural environments
- Clearing of land used for conservation and natural environment uses.

6. Cumulative impacts

Cumulative land use and property impacts may arise from the interaction of construction and operation activities of the project, and other approved or proposed projects in the area. When considered in isolation, specific project impacts may be considered minor. These minor impacts may, however, be more substantial, when the impact of multiple projects on the same receivers is considered.

The projects detailed in **Table 6-1** are in varying stages of delivery and planning. This chapter provides an assessment of cumulative land use and property impacts based on the most current and publicly available information for these projects. In many instances this is a high-level qualitative assessment. For land use and property, overlapping construction or operational timeframes do not usually add to the overall level of impact as it does for other disciplines, such as traffic or noise. This is because once physical changes are made to land, regardless of whether they are made at the same time or separately, the impact level does not change.

The contribution of the project to cumulative impacts on land use and property in the area is minor, considering the project is located next to existing road infrastructure where possible and construction would be managed through the implementation of a range of environmental management measures. Once operational, the project would support future industrial development in the area through improved access and connectivity for freight and commercial vehicles, such as improved safety outcomes and reduced travel times for freight vehicles.

Table 6-1 Assessment of potential cumulative impacts for relevant identified projects

| Project (approval status) | Relevance in consideration of cumulative impacts | Potential cumulative impacts |
|--|--|--|
| Black Hill Employment Lands (Northern Estates) (In planning) | Located south of John Renshaw Drive and west of M1 Pacific Motorway. | Potential cumulative land use and property impacts are not expected as a result of this project. Once operational, this project would support future industrial development in the area through improved access and connectivity for freight and commercial vehicles. |
| Kinross Industrial / Weathertex, Heatherbrae (Approved) | Located within the project's construction footprint and on land identified for AS16 on Masonite Road, Heatherbrae. | The industrial development is proposed within the construction footprint and on land identified for AS16. If these industrial developments are developed prior to or during construction, this ancillary facility may be unavailable to the project for use. Construction of the project and these industrial developments have potential to extend potential disruptions for surrounding land uses relating to amenity and traffic access. Once operational, the project would support access to the motorway for industrial uses within the development via the Pacific Highway and the Tomago and Raymond Terrace interchanges. |
| Black Hill Hunter Business Park, Cessnock (in planning) | Located south of John Renshaw Drive and west of the M1 Pacific Motorway. | This development is currently in planning and is anticipated to be similar to the Northern Estates development. Due to the differing time frames involved, it is not expected there would be any cumulative impacts during construction. Once operational, the project would support future industrial development in the area through improved access and connectivity for freight and commercial vehicles. |

| Project (approval status) | Relevance in consideration of cumulative impacts | Potential cumulative impacts |
|--|---|---|
| Newcastle Power Station (In planning) | Located within the project's construction footprint at Tomago near Old Punt Road. | <p>AGL propose to construct a 250 Mega Watt (MW) gas fired power station at Tomago, with gas pipelines and electricity transmission lines. Construction of the proposed power station is due to commence in 2021 with the proposed power station expected to be operational in 2022. The site for the proposed power station is located between the Pacific Highway and Old Punt Road, north of the Tomago industrial area (AGL, 2019).</p> <p>The proposed power station would be located next to AS12 and AS13. Consideration of the project has been given in the siting and layout of the proposed power station. Cumulative impacts on land use and property would mainly result from the loss of grazing land, although this is not expected to impact on the availability of this land use type in the study area.</p> |
| Hexham Straight (In planning) | Located about one kilometre south of the project at Hexham | <p>This road project is currently in planning. Transport plan to upgrade the Hexham Straight (Maitland Road) between Sandgate and Hexham Bridge. The proposed scope of the Hexham Straight project involves the addition of an extra lane in both directions, removal of the existing bridges and construction of two new bridges at Ironbark Creek, adjustments to connecting roads as well as significant utility relocation.</p> <p>The preliminary environmental investigation (Roads and Maritime, 2019) indicates that land use around the Hexham Straight project is reflective of the industrial and transportation history. Most buildings and infrastructures function as ancillary facilities to support transportation and industrial uses. Residential and commercial development is sparse.</p> <p>The primary land uses in and near Hexham Straight include infrastructure, industry and commercial, environmental conservation, waterways and Crown land. Utilities are also located in the area.</p> <p>While the concept design and environmental assessment is currently being carried out for the Hexham Straight project and the level of impact on land use and property generated by this project is currently unknown, cumulative impacts on land use are not expected given the project's relatively low impact on industrial and commercial uses in this location.</p> <p>Combined, both projects would have cumulative benefits in relation to road access to support existing land uses and growth and development in the study area.</p> |
| Lower Hunter Freight Corridor (in planning) | Investigation area includes Hexham. | <p>The Transport Lower Hunter Freight Corridor (LHFC) website (TfNSW, July 2018) indicates that in 2018 preliminary investigations were being carried out to assess options for a dedicated freight rail line between Fassifern and Hexham. No options were available on the website to review. An investigation areas figure between Fassifern and Hexham was available.</p> <p>As corridor options and environmental assessment are not available for the LHFC, the level of impact on land use and property generated by this project is currently unknown. Consequently, cumulative impacts associated with the construction or operation of the project is unknown.</p> |

| Project (approval status) | Relevance in consideration of cumulative impacts | Potential cumulative impacts |
|---|--|--|
| Richmond Vale Rail Trail to Shortland, including Shortland to Tarro cycleway (In planning) | Intersects the project at Tarro | This project is not expected to result in cumulative impacts with the project. The Richmond Vale Rail Trail to Shortland would encourage additional active transport use within the study area. The project would impact on land identified for future extension of the Richmond Vale Rail Trail to Tarro. Access would be maintained for the future extension under the viaduct. |
| Hunter Gas Pipeline (Approved) | Intersects the project at Tomago | This project would cross the construction footprint at Tomago. Construction is planned between 2023 and 2028. The pipeline follows the existing infrastructure corridor at Tomago and passes through land used for primary production either side of the Hunter River. Cumulative impacts on land use and property would mainly result from the loss of land used for primary production, although this is not expected to impact on the availability of this land use type in the study area. |

7. Environmental management measures

The management measures provided in **Table 7-1** have been developed to specifically manage potential land use and property impacts which have been predicted as a result of the project. These management measures will be incorporated into relevant Environmental Management Plans (EMPs) prior to construction and operation.

Additional measures relevant to the management of land use and property impacts are also outlined in other working papers of the EIS, including:

- Traffic and Transport Working Paper (Appendix G of the EIS)
- Biodiversity Assessment Report (Appendix I of the EIS)
- Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS)
- Hydrology and Flooding Working Paper (Appendix J of the EIS)
- Socio-economic Working Paper (Appendix M of the EIS).

7.1 Expected environmental outcomes

The project specific environmental management measures in **Table 7-1** have been developed with the aim of minimising or mitigating, as far as practical, impacts on land use and property during construction and operation of the project. Broadly, the expected environmental outcomes are to avoid or minimise impacts on land use and property from the construction and operation of the project. This would be achieved through:

- Partial and full acquisition of land and associated property adjustments in accordance with the requirements of relevant NSW legislation and Transport guidelines
- Relocation of affected property infrastructure (such as fencing or dams) prior to construction and in consultation with affected property owners
- Engagement with utility owners about potential impacts on and relocation of services
- Reinstatement following construction of land used for construction and not required for the ongoing operation of the project.

7.2 Expected effectiveness

Transport have experience in managing potential impacts of road developments of a similar scale and scope to this project. As such, the environmental management measures outlined in **Table 7-1** are expected to be effective.

A Construction Environmental Management Plan (CEMP) would be prepared prior to construction to address the requirements of the project approvals, the environmental management measures outlined in the EIS and all applicable legislation.

Audits and reporting on the effectiveness of environmental management measures is generally carried out to show compliance with management plans and other relevant approvals and would be outlined in detail in the CEMP prepared for the project.

Table 7-1 Environmental management measures

| Impact | Reference | Management measure | Responsibility | Timing |
|---------------------------------|-----------|---|------------------------|--------------------------------------|
| Property acquisition | LU01 | All partial and full acquisitions and associated property adjustments will be carried out in accordance with the requirements of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and the Land acquisition reform 2016 in consultation with landowners. This will include the provision of monetary compensation determined in accordance with the provisions of the Act. | Transport | Prior to construction |
| | LU02 | Property adjustments will be completed in consultation with property owners / business managers. | Transport / Contractor | Prior to construction / construction |
| Rehabilitation of affected land | LU03 | Land subject to temporary use will be rehabilitated as soon as practicable to an appropriate condition, taking into consideration the location, land use characteristics, area and adjacent land uses. This will be carried out in consultation with the land owner. | Transport / Contractor | Construction |

8. Conclusion

This working paper assesses potential land use and property impacts associated with the construction and operation of the M1 Pacific Motorway to Raymond Terrace.

Existing land uses in the study area comprise a mix of rural and agricultural uses, environmental and water resources, manufacturing and industrial uses, commercial uses, utilities and residential uses of varying densities.

Raymond Terrace is a strategic centre within the Hunter Region and will be a focus of population and employment growth. Tomago, Heatherbrae and the convergence of the national road network around Thornton, Beresfield and Black Hill are also identified as significant employment precincts. South of the study area, the urban release areas of West Wallsend, Cameron Park and Edgeworth will be a focus of future housing and urban renewal opportunities.

To date, Transport have acquired 43 lots for the project, which are held over several properties. Property acquisition for the project would directly impact an additional 36 lots held by 18 property owners. Temporary leases of land would also be required to accommodate ancillary construction facilities, with a further seven properties subject to temporary lease only. Land to be acquired for the project includes privately owned land and land owned by the NSW Government, local councils and utility authorities. Land owned by Transport would also be used for the construction and operation of the project. This includes properties previously purchased by Transport for the project and land within existing transport corridors.

Most land affected by the project comprises rural uses, including land used for grazing, and utilities infrastructure, including electricity transmission lines and water and gas pipelines. Dwellings are located on five properties, with these mainly being dwellings associated with rural land uses. The project would directly impact three dwellings, including two dwellings on rural land and one dwelling associated with a commercial property at Heatherbrae. One dwelling is located within the site of the proposed power station, which is due to be operational prior to construction of the project. If the proposed power station proceeds within the timeframe expected, this dwelling would be removed as part of the proposed power station development and only two dwellings would be directly impacted by the project. An additional dwelling is located within the construction footprint at Tarro, next to ancillary facility (AS5). While this dwelling would not be directly impacted by the project, the residents of this property may be required to temporarily relocate during the construction phase. Five properties currently contain commercial uses, while two properties contain social infrastructure. Properties previously purchased by Transport for the project include a mix of land used for grazing, areas of native vegetation, and residential and commercial uses.

Once operational, the project would enhance access and connectivity to the M1 Pacific Motorway and Pacific Highway, allowing more efficient and safer access for residents, workers, businesses and freight and supporting future growth and development of these areas and the wider region.

Locally, potential impacts on land use from the construction and operation of the project are expected to be low given the project mainly passes within or near to existing road corridors or through rural areas used for grazing. While the project would result in a permanent change in land use to transport infrastructure for about 216 hectares of land, most of the affected land uses represent a relatively small proportion of these land uses within the wider City of Newcastle and Port Stephens Council LGAs and are not expected to impact on the overall availability of these uses.

The environmental management measures identified in **Chapter 7** would generally be effective in mitigation potential land use and property impacts of the project.

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Terms and acronyms

| Term / acronym | Description |
|----------------|--|
| CEMP | Construction Environmental Management Plan |
| DPIE | Department of Planning, Industry and Environment |
| EL | Exploration licence |
| EIS | Environmental Impact Statement |
| EMP | Environmental Management Plan |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process |
| ha | Hectares |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| LHFC | Lower Hunter Freight Corridor |
| LSPS | Local Strategic Planning Statement |
| MW | Mega Watt |
| ML | Mining Lease |
| NSW | New South Wales |
| SSI | State Significant Infrastructure |
| Transport | Transport for New South Wales |

Appendix A – Existing land uses

Table A-1 Existing land uses in the study area and project footprints

| Land use category | Area of land use | | |
|--|-----------------------------|----------------------------|-----------------|
| | Construction footprint (ha) | Operational footprint (ha) | Study area (ha) |
| Conservation and natural environments | 91.3 | 61.7 | 1,478.6 |
| Nature conservation | 27.8 | 27.5 | 143.0 |
| Managed resource protection | 58.5 | 31.0 | 809.3 |
| Other minimal use | 5.0 | 3.2 | 526.3 |
| Grazing | 178.2 | 104.6 | 1,501.2 |
| Grazing native vegetation | 91.3 | 65.6 | 723.7 |
| Grazing modified pastures | 86.9 | 39.0 | 777.5 |
| Other primary production uses | 40.4 | 16.6 | 357.9 |
| Plantation forests | 40.4 | 16.6 | 319.8 |
| Perennial horticulture | 0.0 | 0.0 | 1.4 |
| Seasonal horticulture | 0.0 | 0.0 | 5.8 |
| Land in transition | 0.0 | 0.0 | 2.6 |
| Irrigated cropping | 0.0 | 0.0 | 28.3 |
| Manufacturing and industrial | 7.2 | 6.9 | 374.6 |
| Residential and farm infrastructure | 5.7 | 3.3 | 465.3 |
| Services | 13.6 | 9.2 | 410.9 |
| Infrastructure | 98.2 | 81.2 | 323.5 |
| Utilities | 3.8 | 2.2 | 73.6 |
| Transport and communication | 94.4 | 79.0 | 237.0 |
| Waste treatment and disposal | 0.0 | 0.0 | 12.9 |
| Other intensive uses | 8.8 | 1.2 | 130.6 |
| Intensive animal production | 8.8 | 1.2 | 86.6 |
| Mining | 0.0 | 0.0 | 44.0 |
| Water bodies | 13.3 | 5.6 | 240.7 |
| Lake | 0.0 | 0.0 | 1.3 |
| Reservoir / dam | 0.1 | 0.0 | 5.4 |
| River | 10.9 | 4.4 | 204.8 |
| Channel / aqueduct | 2.3 | 1.2 | 29.2 |
| Marsh / wetland | 8.9 | 8.7 | 176.9 |
| Total area | 465.5 | 299.0 | 5,460.3 |

Source: Based on NSW Landuse 2017 (v1.2) from the Department of Planning, Industry and Environment

Table A-2 Proportion of land uses affected by the project

| Land use category | Land use in the construction footprint as proportion of: | | Land use in the operation footprint as proportion of: | |
|---|--|---------------|---|---------------|
| | Study area | Combined LGAs | Study area | Combined LGAs |
| Conservation and natural environments (combined total) | 6.2% | 0.2% | 4.2% | 0.1% |
| Nature conservation | 19.4% | 0.1% | 19.2% | 0.1% |
| Managed resource protection | 7.2% | 1.2% | 3.8% | 0.7% |
| Other minimal use | 1.0% | 0.0% | 0.6% | 0.0% |
| Grazing (combined total) | 11.9% | 0.8% | 7.0% | 0.5% |
| Grazing native vegetation | 12.6% | 1.4% | 9.1% | 1.0% |
| Grazing modified pastures | 11.2% | 0.6% | 5.0% | 0.3% |
| Other primary production uses (combined total) | 11.3% | 6.4% | 4.6% | 2.6% |
| Plantation forests | 12.6% | 9.9% | 5.2% | 4.1% |
| Perennial horticulture | 0.0% | 0.0% | 0.0% | 0.0% |
| Seasonal horticulture | 0.0% | 0.0% | 0.0% | 0.0% |
| Land in transition | 0.0% | 0.0% | 0.0% | 0.0% |
| Irrigated cropping | 0.0% | 0.0% | 0.0% | 0.0% |
| Manufacturing and industrial | 1.9% | 0.4% | 1.8% | 0.4% |
| Residential and farm infrastructure | 1.2% | 0.1% | 0.7% | 0.0% |
| Services | 3.3% | 0.3% | 2.2% | 0.2% |
| Infrastructure (combined total) | 30.4% | 2.3% | 25.1% | 1.9% |
| Utilities | 5.2% | 2.2% | 3.0% | 1.3% |
| Transport and communication | 39.8% | 2.9% | 33.4% | 2.4% |
| Waste treatment and disposal | 0.0% | 0.0% | 0.0% | 0.0% |
| Other intensive uses (combined total) | 6.7% | 1.1% | 0.9% | 0.2% |
| Intensive animal production | 10.2% | 2.3% | 1.4% | 0.3% |
| Mining | 0.0% | 0.0% | 0.0% | 0.0% |
| Water bodies (combined total) | 5.5% | 0.2% | 2.3% | 0.1% |
| Lake | 0.0% | 0.0% | 0.0% | 0.0% |
| Reservoir / dam | 1.6% | 0.0% | 0.0% | 0.0% |
| River | 5.3% | 0.2% | 2.1% | 0.1% |
| Channel / aqueduct | 7.8% | 0.9% | 4.1% | 0.5% |
| Marsh / wetland | 5.0% | 0.3% | 4.9% | 0.3% |

Appendix B – Land use zoning

Table B-1 Land use zones in the study area and project footprints

| Land use zone | Area of land covered by the land use zone | | |
|---------------------------------------|---|----------------------------|-----------------|
| | Construction footprint (ha) | Operational footprint (ha) | Study area (ha) |
| B1 Neighbourhood Centre | – | – | 0.6 |
| B2 Local Centre | – | – | 5.7 |
| B5 Business Development | 1.6 | 1.6 | 30.1 |
| E1 National Parks and Nature Reserves | – | – | 0.04 |
| E2 Environmental Conservation | 102.9 | 60.7 | 1,198.6 |
| E3 Environmental Management | 0.1 | 0.0 | 100.2 |
| E4 Environmental Living | 57.3 | 42.9 | 458.5 |
| IN1 General Industrial | 57.6 | 18.0 | 825.7 |
| IN2 Light Industrial | – | – | 294.7 |
| IN3 Heavy Industrial | – | – | 44.7 |
| R2 Low Density Residential | 0.5 | 0.0 | 237.5 |
| R3 Medium Density Residential | – | – | 17.1 |
| R5 Large Lot Residential | – | – | 17.1 |
| RE1 Public Recreation | 0.3 | 0.01 | 63.3 |
| RE2 Private Recreation | – | – | 50.7 |
| RU1 Primary Production | – | – | 152.5 |
| RU2 Rural Landscape | 50.1 | 12.3 | 838.0 |
| SP1 Special Activities | 14.8 | 5.5 | 665.8 |
| SP2 Infrastructure | 173.0 | 156.5 | 345.6 |
| W1 Natural Waterways | – | – | 29.2 |
| W2 Recreational Waterways | 7.5 | 1.5 | 84.8 |

Note: Land use zones shaded grey are in the construction or operation footprints.

Appendix C – Land use conflict risk assessment

An evaluation matrix presented in the LUCRA Guide was used to evaluate the significance of potential risks for existing land uses, associated with the construction and operation of the project (refer to **Table C-1**). A ranking of 25 is the highest magnitude risk, representing a high likely, very serious event. A ranking of one is the lowest magnitude of risk, representing an almost impossible, very low consequence event.

The criteria for determining the probability or likelihood of impacts occurring and consequence of identified impacts is outlined in **Table C-2**. **Table C-3** presents the outcomes of the evaluation of potential impacts for land uses from the construction and operation of the project and presents the level of impact significance with and without the management measures. Further detail on proposed management measures is provided in **Chapter 7**.

Table C-1 Evaluation matrix

| | | | Probability | | | | |
|-------------|---|------------|----------------|--------|----------|----------|------|
| | | | A | B | C | D | E |
| | | | Almost certain | Likely | Possible | Unlikely | Rare |
| Consequence | 1 | Severe | 25 | 24 | 22 | 19 | 15 |
| | 2 | Major | 23 | 21 | 18 | 14 | 10 |
| | 3 | Moderate | 20 | 17 | 13 | 9 | 6 |
| | 4 | Minor | 16 | 12 | 8 | 5 | 3 |
| | 5 | Negligible | 11 | 7 | 4 | 2 | 1 |

Source: DPI, 2011

Table C-2 Evaluation criteria

| Level | | Description |
|---------------------------|----------------|--|
| Probability | | |
| A | Almost certain | Common or repeating occurrence |
| B | Likely | Known to occur, or 'it has happened' |
| C | Possible | Could occur, or 'I've heard of it happening' |
| D | Unlikely | Could occur in some circumstances, but not likely to occur |
| E | Rare | Practically impossible |
| Level of magnitude | | |
| 1 | Severe | <ul style="list-style-type: none"> Severe and/or permanent damage to the environment Irreversible Severe impact on the community Neighbours are in prolonged dispute and legal action involved |
| 2 | Major | <ul style="list-style-type: none"> Serious and/or long-term impact to the environment Long-term management implications Serious impact on the community Neighbours are in serious dispute |
| 3 | Moderate | <ul style="list-style-type: none"> Moderate and/or medium-term impact to the environment and community Some ongoing management implications Neighbour disputes occur |

| Level | | Description |
|-------|------------|--|
| 4 | Minor | <ul style="list-style-type: none">• Minor and/or short-term impact to the environment and community• Can be effectively managed as part of normal operations• Infrequent disputes between neighbours |
| 5 | Negligible | <ul style="list-style-type: none">• Very minor impact to the environment and community• Can be effectively managed as part of normal operations• Neighbour disputes unlikely |

Source: DPI, 2011

Table C-3 Evaluation of land use impacts

| Summary of impact | Impact significance (without mitigation) | | | Management measure | Impact significance (with mitigation) | | |
|---|--|--------------|--------------|---|---------------------------------------|----------------|--------------|
| | Probability | Consequence | Risk ranking | | Probability | Consequence | Risk ranking |
| Primary production | | | | | | | |
| Construction | | | | | | | |
| Disruption caused by temporary lease of land during construction | Possible (C) | Moderate (3) | 13 | <ul style="list-style-type: none"> Minimise area of land affected by temporary lease Progressively rehabilitation of disturbed areas | Possible (C) | Minor (4) | 8 |
| Spread of weeds between properties | Possible (C) | Moderate (3) | 13 | <ul style="list-style-type: none"> Implementation of weed management strategies in accordance with the measures outlined in the Biodiversity Assessment Report (Appendix I of the EIS). | Unlikely (D) | Moderate (3) | 9 |
| Impacts on farming operations at Beresfield / Tarro | Possible (C) | Minor (4) | 8 | <ul style="list-style-type: none"> Implementation of land access measures as agreed with the property owner | Unlikely (D) | Minor (4) | 5 |
| Potential residual risks for rural land used for construction following rehabilitation of land (for example, increased erosion) | Possible (C) | Moderate (3) | 13 | <ul style="list-style-type: none"> Progressively rehabilitation of disturbed areas Rehabilitation of affected rural land in accordance with relevant guidelines and as agreed with the property owner | Unlikely (D) | Minor (4) | 5 |
| Operation | | | | | | | |
| Permanent loss of primary production land | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> Compensation to affected property owners in accordance with the <i>NSW Land Acquisition (Just Terms Compensation) Act 1991</i> (the Act) and the Land Acquisition Reform 2016 process | Almost certain (A) | Negligible (5) | 11 |

| Summary of impact | Impact significance (without mitigation) | | | Management measure | Impact significance (with mitigation) | | |
|--|--|----------------|--------------|--|---------------------------------------|----------------|--------------|
| | Probability | Consequence | Risk ranking | | Probability | Consequence | Risk ranking |
| Potential severance or fragmentation of rural properties at Beresfield / Tarro | Unlikely (D) | Minor (4) | 5 | <ul style="list-style-type: none"> Provision of access either from existing road or new access roads and tracks provided by the project. Maintain access under the viaduct between and within properties Consultation with property owners about affected land parcels. | Unlikely (D) | Negligible (5) | 2 |
| Changes to property access | Likely (B) | Minor (4) | 12 | <ul style="list-style-type: none"> Provision of access either from existing road or new access roads and tracks provided by the project (as agreed with the property owner). | Likely (B) | Negligible (5) | 7 |
| Intensive uses | | | | | | | |
| Direct impact on residential dwellings | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> Compensation to affected property owners in accordance with the <i>NSW Land Acquisition (Just Terms Compensation) Act 1991</i> (the Act) and the Land Acquisition Reform 2016 process | Almost certain (A) | Negligible (5) | 11 |
| Impact on the availability of residential uses | Unlikely (D) | Negligible (5) | 2 | <ul style="list-style-type: none"> Not required (refer to the Socio-economic Working Paper (Appendix M of the EIS) for discussion about amenity impacts) | Unlikely (D) | Negligible (5) | 2 |
| Impacts on availability of manufacturing and industrial land uses | Unlikely (D) | Negligible (5) | 2 | <ul style="list-style-type: none"> Not required (refer to the Socio-economic Working Paper (Appendix M of the EIS) for discussion about business impacts) | Unlikely (D) | Negligible (5) | 2 |

| Summary of impact | Impact significance (without mitigation) | | | Management measure | Impact significance (with mitigation) | | |
|---|--|--------------|--------------|--|---------------------------------------|----------------|--------------|
| | Probability | Consequence | Risk ranking | | Probability | Consequence | Risk ranking |
| Impacts on land used for commercial and public services | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> • Compensation to affected property owners in accordance with the <i>NSW Land Acquisition (Just Terms Compensation) Act 1991</i> (the Act) and the Land Acquisition Reform 2016 process | Almost certain (A) | Negligible (5) | 11 |
| Impacts on land used for infrastructure | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> • Relocate, adjust or protect affected utilities in consultation with relevant service providers | Almost certain (A) | Negligible (5) | 11 |
| Impact on land used for other intensive uses | Almost certain (A) | Moderate (3) | 20 | <ul style="list-style-type: none"> • Minimise area of land affected as far as practicable • Compensation to affected property owners in accordance with the <i>NSW Land Acquisition (Just Terms Compensation) Act 1991</i> (the Act) and the Land Acquisition Reform 2016 process • Ongoing consultation with the affected property owner | Almost certain (A) | Minor (4) | 16 |
| Conservation and natural environments | | | | | | | |
| Impact on land used for conservation and natural environments | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> • Minimise area of land affected • Progressively rehabilitation of disturbed areas • Provision of off-sets as required | Almost certain (A) | Negligible (5) | 11 |
| Clearing of land used for conservation and natural environment uses | Almost certain (A) | Minor (4) | 16 | <ul style="list-style-type: none"> • Minimise area of land affected • Progressively rehabilitation of disturbed areas • Provision of off-sets as required | Almost certain (A) | Negligible (5) | 11 |

| Summary of impact | Impact significance (without mitigation) | | | Management measure | Impact significance (with mitigation) | | |
|---|--|----------------|--------------|---|---------------------------------------|----------------|--------------|
| | Probability | Consequence | Risk ranking | | Probability | Consequence | Risk ranking |
| Water | | | | | | | |
| Impacts on water uses | Possible (C) | Minor (4) | 8 | <ul style="list-style-type: none"> Maintain access to the Hunter River for commercial and recreational users | Possible (C) | Negligible (5) | 4 |
| Other land use impacts | | | | | | | |
| Impacts on mining leases and exploration licences | Unlikely (D) | Negligible (5) | 2 | <ul style="list-style-type: none"> Not required | Unlikely (D) | Negligible (5) | 2 |
| Impacts on surface and ground water supplies | Possible (C) | Moderate (3) | 13 | <ul style="list-style-type: none"> Implementation of measures outlined in the Surface Water and Groundwater Quality Working Paper (Appendix K of the EIS). | Unlikely (D) | Moderate (3) | 9 |